

December 05, 2024

**VIA EMAIL**

To: ALL BIDDERS

Re: **Addendum #2**  
Reservoir Infrastructure Maintenance Improvement Project  
Capital Project No. 718010X  
NJIB Project Number 1506001-016  
Township of Brick, Ocean County, New Jersey  
CED Project No. BKU-066

You are hereby notified of the following Addendum #2 for the above-referenced project:

Within this Addendum #2, the Contractor is hereby notified of the following updates:

- 1. Remove Bid Form Pages 1-33. Replace with new Bid Form pages 1-30, see attached.**
- 2. Remove the Division II section, pages 1- 62. Replace with new Division II section pages 1-62, See attached.**

**Changes made to the Division II section include the following:**

- **List of Required Submittals was revised**
  - **Section 1.06 Excavation was revised**
  - **Section 1.13 Fine Grading was revised**
  - **Section 1.19 Sand In-Fill was revised**
- 3. Remove Plan Sheet 3 of 18 titled "Quantities" in the "Reservoir Infrastructure Maintenance Improvement Project" dated 09/04/2024. Replace with new Plan Sheet 3 of 18 titled "Quantities" in the "Reservoir Infrastructure Maintenance Improvement Project" dated 09/04/2024, revised 12/04/2024.**


**The Public Bid Opening will be held on Tuesday, December 17th, 2024 at 2:00 pm prevailing time, at The Brick Township Municipal Utilities Authority, 1551 Highway 88 West, Brick, NJ 08724.**

**Bidders are reminded of the requirement to complete and submit the Bid Form, page 1 (Addendum Acknowledgement - see attached for reference). Failure to do so is a mandatory cause of the bid to be rejected.**


Should you have any questions or require additional information, please do not hesitate to contact me.

Very truly yours,  
Colliers Engineering & Design, Inc.

Digitally signed by Jordan R. Volk  
Date: 2024.12.05 16:03:15-04'00'



No. GE47012  
Jordan R Volk, P.E., PMP  
Regional Manager



JRV/aw

**BID FORM**

TO: The Brick Township Municipal Utilities Authority  
1551 Highway 88 West  
Brick, N.J. 08724

RE: **Brick Township Municipal Utilities Authority – Reservoir Infrastructure Mitigation Improvement Project**  
CAPITAL PROJECT 718010X  
FEMA Project No. PDMC-PJ-02-NJ-2019-002

This bid will not be accepted after **2:00 p.m.** prevailing time, and **day of December 17, 2024**, at which time all bids will be publicly opened and read.

\_\_\_\_\_  
(Name of Firm Submitting Bid)

Pursuant to N.J.S.A. 40A:11-23.1a, the undersigned bidder hereby acknowledges receipt of the following notices, revisions, or addenda to the bid advertisement, specifications or bid documents. By indicating date of receipt, bidder acknowledges the submitted bid takes into account the provisions of the notice, revision or addendum. Note that the local unit’s record of notice to bidders shall take precedence.

ADDENDUM No.	DATE	BIDDERS INITIALS

The undersigned hereby proposes and agrees to furnish all the necessary labor, materials, equipment, tools and services necessary for the work specified.

**Included with this bid shall be the following documents:**

1. Bid Document Submission Checklist
2. Bid Security
3. Power of attorney (if bid security is in the form of a bond)
4. Contractor's Experience Statement
5. Consent of Surety
6. Non-Collusion Affidavit
7. Statement of Ownership Disclosure
8. List of Subcontractors
9. Affidavit regarding State Treasurer's list of debarred, suspended and disqualified bidders
10. Affidavit of Non-Discrimination in Employment
11. State of New Jersey Equal Employment Opportunity Requirements (Exhibit B)
12. Disclosure of Investment Activities in Iran Certification

The undersigned hereby proposes and agrees to furnish all the necessary labor, materials, equipment, tools and services necessary for the work specified.

The undersigned has examined the location of the proposed work, the plans, specifications, and other contract documents and is familiar with the local conditions at the place where work is to be performed and understands that information relative to existing structures, apparent and latent conditions and natural phenomena as furnished in the contract documents or by the Owner, carries no guarantee, expressed or implied, as to its completeness or accuracy and has made all due allowances therefore.

The undersigned bidder declares that this bid is made without connection with any other person or persons making bids for the same work and is in all respects fair and without collusion or fraud.

The undersigned bidder has determined the quantity and quality of equipment and materials required; has investigated the location and determined the sources of supply of the materials required; has investigated labor conditions; and has arranged for the continuous prosecution of the work herein described.

The undersigned bidder agrees that the prices bid for all items shall apply to actual quantities required, approved and used during construction of the project, including addenda, change orders, and supplemental agreements.

The undersigned bidder hereby agrees to be bound by the award of the contract and, if awarded the contract on this bid, to execute within ten (10) days after the making of the award the required Contract Agreement, Contract Bonds, and Insurance Certificates, of which Contract this bid, the plans for the work, and the specifications as above indicated shall be a part.

The undersigned bidder understands that the Owner reserves the right to waive any minor informalities or non-material exceptions/defects in a bid, the right to reject any bid containing a material defect(s) and further reserves the right to reject all bids under any circumstances set forth in N.J.S.A. 40A:11-13.2.

Accompanying this bid is a Bid Bond or a Certified Check in the sum of ten percent (10%) of the amount of the bid (but not to exceed \$20,000.00), payable to the Owner as a guarantee that the Agreement will be executed and a Performance Bond, Labor and Material Bond, and the specified Insurance Certificates will be furnished within ten (10) days after receipt of notification that the contract agreements are ready for signature.

If this bid shall be accepted by the Owner, and the undersigned shall fail to contract aforesaid, then the Owner shall be entitled to recover from the bidder the difference between the amount specified in the bid and the amount for which the Owner may contract with another party to perform the work covered by said bid, if the latter amount be in excess of the former.

If this bid shall be accepted by the Owner, the undersigned agrees to complete the entire work proposed under this contract within 365 consecutive calendar days from the date specified in the "Notice to Proceed."

Successful Bidder fully understands the deadlines and urgency to have the base bid scope of work completed to the satisfaction of the Owner, before the deadlines set in the Contract;

The Successful Bidder hereby understands that the Contract is structured to permit mobilization and storing of materials, prior to the Owner, Brick Utilities (BU), lowering the reservoir water elevation;

Successful Bidder fully accepts responsibility for holding material prices and fuel prices, for the duration of the contract, since the primary reservoir remedial work shall not commence until after October 1, 2025;

**BID SCHEDULE**

The following bid price schedule will be completed in ink or typewritten. The amount shall be written in both words and figures. In the case of a discrepancy, the amount written in words will govern. The successful bidder will be required to furnish an itemized breakdown for lump sum items as indicated in the "Instructions to Bidders."

**BASE BID:**

ITEM 1 MOBILIZATION

1 L.S. \$ \_\_\_\_\_ Per L.S.

\_\_\_\_\_  
Write Price

ITEM 2 NO ITEM

ITEM 3 CONSTRUCTION LAYOUT

1 L.S. \$ \_\_\_\_\_ Per L.S.

\_\_\_\_\_  
Write Unit Price

ITEM 4 NO ITEM

ITEM 5 INLET PROTECTION

6 UNITS \$ \_\_\_\_\_ Per UNIT

\_\_\_\_\_  
Write Unit Price

\$ \_\_\_\_\_ Total

ITEM 6 SILT FENCE

7,100 L.F. \$ \_\_\_\_\_ Per L.F.

\_\_\_\_\_  
Write Price

\$ \_\_\_\_\_ Total

ITEM 7 TURBITITY PROTECTION SCREEN, COMPLETE

7,600 L.F. \$ \_\_\_\_\_ Per L.F.

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total

ITEM 8 NO ITEM

ITEM 9 NO ITEM

ITEM 10 CLEARING SITE

1 L.S. \$ \_\_\_\_\_ Per L.S.

\_\_\_\_\_

Write Unit Price

\$ \_\_\_\_\_ Total

ITEM 11 EXCAVATION, TEST PIT (IAWD)

230 C.Y. \$ \_\_\_\_\_ Per C.Y.

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total

ITEM 12 NO ITEM

ITEM 13 EXCAVATION, UNCLASSIFIED (IAWD)

100 C.Y. \$ \_\_\_\_\_ Per C.Y.

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total

ITEM 14 NO ITEM

ITEM 15 FINE GRADING

64,000 S.Y. \$ \_\_\_\_\_ Per S.Y.

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total

ITEM 16 ¾" CLEAN STONE (IAWD)

1,000 TN \$ \_\_\_\_\_ Per TN

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total

ITEM 17 SAND IN-FILL (IAWD)

A. RELOCATED ON-SITE SAND (IAWD)

11,500 S.Y. \$ \_\_\_\_\_ Per S.Y.

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total

B. IMPORTED SAND (IAWD)

5,250 C.Y. \$ \_\_\_\_\_ Per C.Y.

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total

ITEM 18 NO ITEM

ITEM 19 SLOPE MATTRESS HYDROTEX UNIFORM SECTION 400, COMPLETE

530,000 S.F. \$ \_\_\_\_\_ Per S.F.

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total



ITEM 20      HYDROTEX UNIFORM SECTION 800, COMPLETE

80,000 S.F.    \$ \_\_\_\_\_ Per S.F.

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total

ITEM 21      CONCRETE CYLINDER TESTING (TESTING OF NON-MATTRESS  
INJECTED CONCRETE)

8 LOT          \$ \_\_\_\_\_ Per LOT

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total

ITEM 22      RESTORATION, COMPLETE

1 L.S.         \$ \_\_\_\_\_ Per L.S.

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total

ITEM 23      FINAL CLEANUP

1 L.S.         \$ \_\_\_\_\_ Per L.S.

\_\_\_\_\_

Write Price

\$ \_\_\_\_\_ Total

**ADD-ALTERNATE 'A' – RESERVOIR PERIMETER ROAD REPAIRS**

ITEM A-1      FUEL PRICE ADJUSTMENT

ALL            \$ 10,000.00 \_\_\_\_\_ Per AL

\_\_\_\_\_

Ten Thousand Dollars

Write Price

\$ 10,000.00 \_\_\_\_\_ Total

ITEM A-2 ASPHALT PRICE ADJUSTMENT

ALL \$ 10,000.00 Per AL  
Ten Thousand Dollars  
Write Price  
\$ 10,000.00 Total

ITEM A-3 HMA MILLING, 3" OR LESS

11,100 S.Y. \$ \_\_\_\_\_ Per S.Y.  
\_\_\_\_\_  
Write Price  
\$ \_\_\_\_\_ Total

ITEM A-4 HOT MIX ASPHALT 25M64, BASE COURSE (IAWD)

300 TN \$ \_\_\_\_\_ Per TN  
\_\_\_\_\_  
Write Price  
\$ \_\_\_\_\_ Total

ITEM A-5 HOT MIX ASPHALT 9.5M64 SURFACE COURSE

1,400 TN \$ \_\_\_\_\_ Per TN  
\_\_\_\_\_  
Write Price  
\$ \_\_\_\_\_ Total

ITEM A-6 DGA BASE COURSE, 6" TH. (IAWD)

11,100 S.Y. \$ \_\_\_\_\_ Per S.Y.  
\_\_\_\_\_  
Write Price  
\$ \_\_\_\_\_ Total

**Total Base Bid**  
**(Items No. 1 through 23)**

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(Price in Words)

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(Price in Figure)

**Total Alternate Bid**  
**(Items A-1 thru A-6)**

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(Price in Words)

---

(Price in Figure)

**Total Base Bid and Alternate Bid**  
**(Items No. 1 through 23 plus Add Alt A1 thru A-6 Inclusive)**

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(Price in Words)

---

(Price in Figure)

IF A CORPORATION:

Name of Contractor \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

Printed Name and Title \_\_\_\_\_

Business Address \_\_\_\_\_

Tax Identification No. \_\_\_\_\_

Incorporated under the laws of the State of \_\_\_\_\_

Names of Officers:

President \_\_\_\_\_

Secretary \_\_\_\_\_

Treasurer \_\_\_\_\_

Dated: \_\_\_\_\_

(Affix Corporate Seal Here)

IF A PARTNERSHIP, INDIVIDUAL, OR NON-INCORPORATED ORGANIZATION:

Name of Company \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

Printed Name and Title \_\_\_\_\_

Business Address \_\_\_\_\_

Tax Identification Number \_\_\_\_\_

Names and Addresses of Company Members:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**BID BOND**

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,  
\_\_\_\_\_ as Principal, and  
\_\_\_\_\_ as Surety, are hereby  
held and firmly bound unto \_\_\_\_\_

as Owner, in the sum of \_\_\_\_\_  
for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our  
heirs, executors, administrators, successors and assigns. The condition of the above obligation is such  
that whereas the Principal has submitted to the Owner a certain bid, attached hereto and made a part  
hereof, to enter into a contract in writing for

\_\_\_\_\_  
NOW, THEREFORE,

- (a) If said bid shall be rejected, or in the alternate,
- (b) If said bid shall be accepted and the Principal shall execute and deliver a contract in the  
form of Agreement attached hereto (properly completed in accordance with said bid) and  
shall furnish a bond for the faithful performance of said Agreement and for the payment  
of all persons performing labor or furnishing materials in connection therewith, and shall  
in all other respects perform the agreement created by the acceptance of said bid,

then this obligation shall be void; otherwise, the same shall remain in force and effect, it being expressly  
understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event  
exceed the amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its  
bond shall in no way be impaired or affected by any extension of the time within which the Owner may  
accept such bid, and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such  
of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be  
signed by their proper officers, the day and year as set forth below.

Date: \_\_\_\_\_

\_\_\_\_\_  
(Principal)

\_\_\_\_\_  
(Surety)

By: \_\_\_\_\_

(Affix Seal Here)



**CONSENT OF SURETY**

A performance bond will be required from the successful contractor on this project, and consequently, all bidders shall submit, with their bid, a consent of surety in substantially the following form:

To: \_\_\_\_\_  
(Owner)

Re: \_\_\_\_\_  
(Contractor)

\_\_\_\_\_  
(Project Description)

This is to certify that the \_\_\_\_\_  
(Surety Company)

will provide to \_\_\_\_\_ a performance bond in  
(Owner)

the full amount of awarded contract in the event that said contractor is awarded a contract for the above project.

\_\_\_\_\_  
(CONTRACTOR)

\_\_\_\_\_  
(Authorized Agent of Surety Company)

Date: \_\_\_\_\_

**CONSENT OF SURETY MUST BE SIGNED BY AN AUTHORIZED AGENT  
OR REPRESENTATIVE OF A SURETY COMPANY AUTHORIZED TO DO BUSINESS  
IN NEW JERSEY AND NOT BY THE  
INDIVIDUAL OR COMPANY REPRESENTATIVE SUBMITTING THE BID.**

**NON-COLLUSION AFFIDAVIT**

State of New Jersey \_\_\_\_\_

§:

County of \_\_\_\_\_

I, \_\_\_\_\_ of the City of \_\_\_\_\_ in the  
County of \_\_\_\_\_ and the State of \_\_\_\_\_ of full age,  
being duly sworn to law on my oath depose and say that I am \_\_\_\_\_

of the firm of \_\_\_\_\_, the bidder making  
the bid for the above named project, and that I executed the said bid with full authority to do so and  
that said bidder has not, directly or indirectly, entered into any agreement, participated in any  
collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with  
the above named project, and that all statements contained in said bid and in this affidavit are true  
and correct and made with full knowledge that The Brick Township Municipal Utilities Authority  
relies upon the truth of the statements contained in said bid and in the statements contained in this  
affidavit in awarding the contract for said project.

I further warrant that no person or selling agency has been employed or retained to solicit or  
secure such contract upon an agreement or understanding for a commission, percentage, brokerage  
or contingent fee, except bona fide established commercial or selling agencies maintained by

\_\_\_\_\_  
(Name of Bidder) (N.J.S.A 52:3415).

By: \_\_\_\_\_

\_\_\_\_\_  
(Typed Name and Title)

Subscribed and sworn to before me

this \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_

\_\_\_\_\_  
(Notary Public of \_\_\_\_\_)



**STATEMENT OF OWNERSHIP DISCLOSURE**

N.J.S.A. 52:25-24.2 (P.L. 1977, c.33, as amended by P.L. 2016, c.43)

**This statement shall be completed, certified to, and included with all bid and proposal submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.**

**Name of Organization:** \_\_\_\_\_

**Organization Address:** \_\_\_\_\_

**Part I Check the box that represents the type of business organization:**

- Sole Proprietorship (skip Parts II and III, execute certification in Part IV)
- Non-Profit Corporation (skip Parts II and III, execute certification in Part IV)
- For-Profit Corporation (any type)     Limited Liability Company (LLC)
- Partnership     Limited Partnership                       Limited Liability Partnership (LLP)
- Other (be specific): \_\_\_\_\_

**Part II**

The list below contains the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be. **(COMPLETE THE LIST BELOW IN THIS SECTION)**

**OR**

No one stockholder in the corporation owns 10 percent or more of its stock, of any class, or no individual partner in the partnership owns a 10 percent or greater interest therein, or no member in the limited liability company owns a 10 percent or greater interest therein, as the case may be. **(SKIP TO PART IV)**

(Please attach additional sheets if more space is needed):

Name of Individual or Business Entity	Home Address (for Individuals) or Business Address

**Part III DISCLOSURE OF 10% OR GREATER OWNERSHIP IN THE**

## STOCKHOLDERS, PARTNERS OR LLC MEMBERS LISTED IN PART II

**If a bidder has a direct or indirect parent entity which is publicly traded, and any person holds a 10 percent or greater beneficial interest in the publicly traded parent entity as of the last annual federal Security and Exchange Commission (SEC) or foreign equivalent filing, ownership disclosure can be met by providing links to the website(s) containing the last annual filing(s) with the federal Securities and Exchange Commission (or foreign equivalent) that contain the name and address of each person holding a 10% or greater beneficial interest in the publicly traded parent entity, along with the relevant page numbers of the filing(s) that contain the information on each such person. Attach additional sheets if more space is needed.**

Website (URL) containing the last annual SEC (or foreign equivalent) filing	Page #'s

**Please list the names and addresses of each stockholder, partner or member owning a 10 percent or greater interest in any corresponding corporation, partnership and/or limited liability company (LLC) listed in Part II other than for any publicly traded parent entities referenced above. The disclosure shall be continued until names and addresses of every noncorporate stockholder, and individual partner, and member exceeding the 10 percent ownership criteria established pursuant to N.J.S.A. 52:25-24.2 has been listed. Attach additional sheets if more space is needed.**

Stockholder/Partner/Member and Corresponding Entity Listed in Part II	Home Address (for Individuals) or Business Address

### **Part IV Certification**

I, being duly sworn upon my oath, hereby represent that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I acknowledge: that I am authorized to execute this certification on behalf of the bidder/proposer; that The Brick Township Municipal Utilities Authority (Brick Utilities) is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the completion of any contracts with Brick Utilities to notify the Brick Utilities in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the, permitting the Brick Utilities to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

**LIST OF SUBCONTRACTORS**

As per the requirements of N.J.S.A. 40A:11-16, the following subcontractors must be listed if applicable. Additionally, all subcontractors shall be qualified in accordance with these specifications.

<u>_____</u> <b>Initial Here If None</b>	
<u>Type of Work</u>	<u>Name and Address</u>
Plumbing Work	_____ _____ _____
Electrical	_____ _____ _____
Structural Steel & Ornamental Work	_____ _____ _____
HVAC Work	_____ _____ _____

Add supplementary page if necessary.

**STATE TREASURER'S LIST OF DEBARRED,  
SUSPENDED AND DISQUALIFIED BIDDERS**

The Contractor shall submit with his bid a sworn statement, as set forth herein signed by an officer or partner of the Contractor, indicating whether or not the Contractor is at the time of the bid, included on the State Treasurer's List of Debarred, Suspended, or Disqualified Bidders. The Contractor will immediately notify the Owner whenever it appears that a Contractor is on the State Treasurer's List. The Contractor may be debarred, suspended or disqualified from contracting with the State of New Jersey and NJDEP if the Contractor commits any of the acts listed in N.J.A.C. 7:1D-2.2.

STATE OF NEW JERSEY

§:

COUNTY OF \_\_\_\_\_

I, \_\_\_\_\_ of the City of \_\_\_\_\_  
in the County of \_\_\_\_\_ and the State of \_\_\_\_\_ of full age,  
being duly sworn according to law on my oath depose and say that:

I am \_\_\_\_\_, an officer of the firm of \_\_\_\_\_  
\_\_\_\_\_ the bidder making the Proposal for the above named work,  
and that I executed the said Proposal with full authority to do so that said bidder at the time of making of this bid, is not included on the State of New Jersey, State Treasurer's List of Debarred, Suspended and Disqualified Bidder; and that all statements contained in said Proposal and in this affidavit are true and correct, and made with the full knowledge that the Owner as Local Unit relies upon the truth of the statements contained in said Proposal and in the statements contained in this affidavit in awarding the contract for said work.

The undersigned further warrants that should the name of the firm making this bid appear on the State Treasurer's List of Debarred, Suspended and Disqualified Bidders at anytime prior to, and during the life of this Contract, including the Guarantee Period, that The Brick Township Municipal Utilities Authority shall be immediately notified by the signatory of this Eligibility Affidavit.

The undersigned understands that the firm making the bid as a Contractor is subject to debarment, suspension and/or disqualification in contracting with the State of New Jersey and the Department of Environmental Protection if the Contractor, pursuant to N.J.A.C. 7:1D-2.2 commits any of the acts listed therein, and as determined according to applicable law and regulation.

\_\_\_\_\_  
(Insert Name and Address of Contractor)

\_\_\_\_\_  
(Insert Name and Title of Affiant)

Subscribed and sworn  
before me this \_\_\_\_\_ day  
of \_\_\_\_\_ 20 \_\_\_\_

\_\_\_\_\_  
Notary Public of \_\_\_\_\_  
My commission expires \_\_\_\_\_, 20 \_\_\_\_

**AFFIDAVIT OF NON-DISCRIMINATION IN EMPLOYMENT**

(N.J.S.A. 10:2-1 through 10:2-4)

(This form is a part of the Proposal)

STATE OF \_\_\_\_\_

§:

COUNTY OF \_\_\_\_\_

\_\_\_\_\_, being first duly sworn, deposes and says he is the \_\_\_\_\_ (sole owner, a partner, president, secretary) of \_\_\_\_\_ the party making the foregoing Proposal or Bid, (the "CONTRACTOR"); that in the hiring of persons for the performance of WORK under this Contract or any Subcontract hereunder, or for the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under this Contract, neither the CONTRACTOR, nor any person acting on behalf of such Contractor or Subcontractor, shall, by reason of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex, discriminate against any person who is qualified and available to perform the WORK to which the employment relates; that neither the CONTRACTOR, nor any person acting on its behalf, shall, in any manner, discriminate against or intimidate any employee engaged in the performance of WORK under this Contract, or any Subcontract hereunder, or engaged in the procurement, manufacture, assembling or furnishing of any materials, equipment, supplies or services to be acquired under this Contract, on account of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex; that there may be deducted from the amount payable to the CONTRACTOR by the OWNER under this Contract, a penalty of \$50.00 for each person for each calendar day during which such person is discriminated against or intimidated in violation of the provisions of the Contract; and that this Contract may be canceled or terminated by the OWNER and all moneys due or to become due hereunder may be forfeited for any violation of these provisions occurring after notice to the Contractor from the Owner of any prior violation of these provisions.

Sworn to me and subscribed before me

this \_\_ day of \_\_\_\_\_, 20\_\_\_\_

\_\_\_\_\_

Affiant

\_\_\_\_\_ Notary Public

(SEAL)

# STATE OF NEW JERSEY EQUAL EMPLOYMENT OPPORTUNITY REQUIREMENTS

## EXHIBIT B

### MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE

N.J.S.A. 10:5-31 et seq. (P.L.1975, c.127)

N.J.A.C. 17:27-1.1 et seq.

### CONSTRUCTION CONTRACTS

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

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity 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 Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable 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 age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer, pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. 17:27-7.2; provided, however, that the Dept. of LWD, Construction EEO Monitoring Program, may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B, and C, as long as the Dept. of LWD,

RESERVOIR INFRASTRUCTURE MAINTENANCE  
IMPROVEMENTS PROJECT  
CAPITAL PROJECT NO. 718010X - ADDENDUM 2

Construction EEO Monitoring Program is satisfied that the contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Dept. of LWD, Construction EEO Monitoring Program, that its percentage of active “card carrying” members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with N.J .A.C. 17:27-7.2. The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

11. (A) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or sub- contractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J .S.A. 10:5-31 et. seq., as supplemented and amended from time to time and the Americans with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the contractor or sub- contractor agrees to afford equal employment opportunities minority and women workers directly, consistent with this chapter. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities as specified in this chapter, the contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the hiring or scheduling procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.

12.

(B) If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions:

(1) To notify the public agency compliance officer, the Dept. of LWD, Construction EEO Monitoring Program, and minority and women referral organizations listed by the Division pursuant to N.J .A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;

(2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;

(4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and non- discrimination standards set forth in this regulation, as well as with applicable Federal and State court decisions;

6) To adhere to the following procedure when minority and women workers apply or are referred to the

contractor or subcontractor:

(i) The contractor or subcontractor shall interview the referred minority or women worker.  
(ii) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the contractor or subcontractor shall in good faith determine the qualifications of such individuals. The contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However, a contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Dept. of LWD, Construction EEO Monitoring Program. If necessary, the contractor or subcontractor shall hire or schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below.

(iii) The name of any interested women or minority individual shall be maintained on a waiting list, and shall be considered for employment as described in (i) above, whenever vacancies occur. At the request of the Dept. of LWD, Construction EEO Monitoring Program, the contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.

(iv) If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the public agency compliance officer and to the Dept. of LWD, Construction EEO Monitoring Program.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Dept. of LWD, Construction EEO Monitoring Program and submitted promptly to the Dept. of LWD, Construction EEO Monitoring Program upon request.

(C) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of (B) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and the Dept. of LWD, Construction EEO Monitoring Program an initial project workforce report (Form AA-201) electronically provided to the public agency by the Dept. of LWD, Construction



EEO Monitoring Program, through its web- site, for distribution to and completion by the contractor, in accordance with N.J .A.C. 17:27-7. The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Dept. of LWD, Construction EEO Monitoring Program, and to the public agency compliance officer.

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-the-job programs for outreach and training of minorities and women.

(D) The contractor and its subcontractors shall furnish such reports or other documents to the Dept. of LWD, Construction EEO Monitoring Program as may be requested by the Dept. of LWD, Construction EEO Monitoring Program from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Dept. of LWD, Construction EEO Monitoring Program for conducting a compliance investigation pursuant to N.J .A.C. 17:27-1.1 et seq.

Name of Company: \_\_\_\_\_

Signature: \_\_\_\_\_ Title: \_\_\_\_\_

Date: \_\_\_\_\_

**AFFIDAVIT OF NON-DISCRIMINATION IN EMPLOYMENT**

RESERVOIR INFRASTRUCTURE MAINTENANCE  
IMPROVEMENTS PROJECT  
CAPITAL PROJECT NO. 718010X - ADDENDUM 2

(N.J.S.A. 10:2-1 through 10:2-4)  
(This form is a part of the Proposal)

STATE OF \_\_\_\_\_

§:

COUNTY OF \_\_\_\_\_

\_\_\_\_\_, being first duly sworn, deposes and says he is the \_\_\_\_\_ (sole owner, a partner, president, secretary) of \_\_\_\_\_ the party making the foregoing Proposal or Bid, (the "CONTRACTOR"); that in the hiring of persons for the performance of WORK under this Contract or any Subcontract hereunder, or for the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under this Contract, neither the CONTRACTOR, nor any person acting on behalf of such Contractor or Subcontractor, shall, by reason of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex, discriminate against any person who is qualified and available to perform the WORK to which the employment relates; that neither the CONTRACTOR, nor any person acting on its behalf, shall, in any manner, discriminate against or intimidate any employee engaged in the performance of WORK under this Contract, or any Subcontract hereunder, or engaged in the procurement, manufacture, assembling or furnishing of any materials, equipment, supplies or services to be acquired under this Contract, on account of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex; that there may be deducted from the amount payable to the CONTRACTOR by the OWNER under this Contract, a penalty of \$50.00 for each person for each calendar day during which such person is discriminated against or intimidated in violation of the provisions of the Contract; and that this Contract may be canceled or terminated by the OWNER and all moneys due or to become due hereunder may be forfeited for any violation of these provisions occurring after notice to the Contractor from the Owner of any prior violation of these provisions.

\_\_\_\_\_

Sworn to me and subscribed before me

Affiant

this \_\_\_ day of \_\_\_\_\_, 20 \_\_\_

\_\_\_\_\_ Notary Public

(SEAL)

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
CERTIFICATION OF BIDDER REGARDING  
EQUAL EMPLOYMENT OPPORTUNITY**

Name of Bidder: \_\_\_\_\_

Name of OWNER: Brick Township Municipal Utilities Authority

Project: \_\_\_\_\_

INSTRUCTIONS

This certification is required pursuant of Executive Order 11246, Part II, Section 203 (b), (30 F.R. 12319-25). Each bidder is required to state in his bid whether he has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether he has filed all compliance reports due under applicable filing requirements.

CONTRACTOR'S CERTIFICATION

Contractor's Name: \_\_\_\_\_

Address: \_\_\_\_\_

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.  
YES \_\_\_\_\_ NO \_\_\_\_\_
2. Compliance reports were required to be filed in connection with such contract or subcontract.  
YES \_\_\_\_\_ NO \_\_\_\_\_
3. Bidder has filed all compliance reports due under applicable instructions, including EEO-1.  
YES \_\_\_\_\_ NO \_\_\_\_\_
4. If answer to Item 3 is a NO, please explain in detail on reverse side of this certification.

Certification - the information above is true and complete to the best of my knowledge and belief. A willfully false statement is punishable by law. (U.S. Code, Title 18, Section 1001)

\_\_\_\_\_  
(NAME AND TITLE OF SIGNER - PLEASE TYPE)

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

WITNESS:

SEAL

Each bidder is further required to comply with the following requirements of the Executive Order 11246, Part II, Section 202:

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

(1) The contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, 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 officer setting forth the provisions of 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, color, or national origin.

(3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The contractor will include the provisions of Paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of Sept. 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, That in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**CERTIFICATION OF NONSEGREGATED FACILITIES**

(Applicable to federally assisted construction contracts and related subcontracts exceeding \$10,000 which are not exempt from the Equal Opportunity clause.)

The federally assisted construction CONTRACTOR certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction CONTRACTOR certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction CONTRACTOR agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms, and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The federally assisted construction CONTRACTOR agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such certifications in his files.

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

\_\_\_\_\_  
Name and Title of Signer (Please Type)

WITNESS: \_\_\_\_\_

SEAL

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001



**BID DOCUMENT SUBMISSION CHECKLIST**  
**BRICK TOWNSHIP MUNICIPAL UTILITIES AUTHORITY**  
**RESERVOIR INFRASTRUCTURE MITIGATION**  
**IMPROVEMENTS PROJECT**  
**CAPITAL PROJECT NO. 718010X**

A. Failure to submit the following documents is a mandatory cause for the bid to be rejected (N.J.S.A. 40A:11 23.2). Checkmarks require submission with bid. Initial each item submitted with bid.

Checkmarks	Bidders Initials
A Bid Guarantee as required by N.J.S.A. 40A:11-21 (Bid Bond with Power of Attorney, Certified Check or Cashier's Check)	
A Consent of Surety, pursuant to N.J.S.A. 40A:11-22 & Contract Specifications, Instruction to Bidders, Item Number 16.0 Consent of Surety	
A statement of corporate ownership, pursuant to N.J.S.A. 52:25-24.2 (Statement of Ownership Disclosure)	
A listing of subcontractors as required by N.J.S.A. 40A:11-16 (Subcontractor's Declaration)	
If applicable, bidder's acknowledgment of receipt of any notice(s) or revisions(s) or addenda to an advertisement, specifications or bid document (s)	
Bid Form (s)	

B. Failure to submit the following documents may be a cause for the bid to be rejected (N.J.S.A. 40A:11;23.lb). Checkmarks require submission with bid. Initial each item submitted with bid.

Checkmarks	Bidders Initials
A copy of Business Registration Certificate issued by the State of New Jersey Department of the Treasury Division of Revenue, including subcontractors required to be listed in the contractor's submission (i.e., "LIST OF SUBCONTRACTORS"). If not submitted with the bid submission, is required prior to contract award.	
Submission of a Non-Collusion Affidavit (this form must be notarized)	
Contractors statement of Qualifications	
Affidavit regarding State Treasurer's list of debarred, suspended and disqualified bidders.	
Affidavit of Non-Discrimination in Employment	
Affirmative Action Evidence. State of New Jersey Equal Employment Opportunity Requirements (Exhibit B)	
Copy of Certification of Registration with the Department of Labor (if Contract is for work in a Public Building, this does not apply to utility or treatment plant Contracts). If not submitted with the bid submission, is required prior to contract award.	

	All unit prices submitted, the extensions properly computed and the total price stated in figures and in writing	
	All forms properly signed, certified and notarized as required	
	Properly addressed and sealed envelope	

C. SIGNATURE: The undersigned authorized representative hereby acknowledges and has submitted the above listed requirements.

Name of Bidder:

\_\_\_\_\_

Print Name & Title:

\_\_\_\_\_

Signature:

\_\_\_\_\_ Date: \_\_\_\_\_



## DIVISION 2

This contract is based on the following technical specifications. In addition, said Contractor shall adhere to the 2019 Edition of the NJDOT Standard Specifications for Road and Bridge Construction or as amended and supplemented for any clarifications or discrepancies.

### List of Required Submittals:

- 1) *Inlet Protection*
- 2) *Silt Fence*
- 3) *Floating Turbidity Barrier*
- 4) *Mix formulas for:*
  - a. *HMA Base Course, 25M64*
  - b. *HMA Surface Course, 9.5M64*
- 5) *Tack Coat*
- 6) *¾" Clean Stone*
- 7) *16Oz. Non-Woven Geotextile*
- 8) *Seeding, Fertilizer & Topsoil Mix*
- 9) *Concrete, 4000 psi*
- 10) *Geotextile for Concrete Filled Geotextile Mattress – 4 & 8"*
- 11) *Weep Holes*
- 12) *DGA Sub-Base*
- 13) *Imported cover sand*

### **1.01 MOBILIZATION**

#### 1.01.01 Scope of Work

- A. Mobilization shall consist of the cost of initiating the contract, including all bonds, insurance, porta-pots, permit fees, trash collection, etc. Payment for mobilization will be made at the lump sum price bid for this item in the proposal, which price shall include the cost of initiating the contract. The provisions for payment for the item mobilization supersede any provisions elsewhere in the specifications for including the costs of these initial services and facilities in the prices bid for the various items scheduled in the proposal. The lump sum price bid for mobilization shall be payable to the contractor whenever he shall have completed 10 percent of the work of the contract. For the purposes of this item, 10 percent of the work shall be considered completed when the total of payments earned, exclusive of the amount bid for this item, shown on the monthly certificates of the approximate quantities of work done, shall exceed 10 percent of the total price bid for the contract.
- B. The lump sum price bid for mobilization is limited to the following maximum amounts:

Original Contract Amount (including Mobilization)

From more than	To and including	Maximum amount for Section of Mobilization
0	100,000	3,000
100,000	500,000	15,000
500,000	1,000,000	30,000
1,000,000	2,000,000	60,000
2,000,000	3,000,000	90,000
3,000,000	4,000,000	120,000
4,000,000	5,000,000	125,000
5,000,000	6,000,000	150,000
6,000,000	7,000,000	175,000
7,000,000	10,000,000	200,000
10,000,000	----	2.5% of Amt. Bid

1.01.02 Materials

This section is intentionally left Blank.

1.01.03 Methods of Construction

Section 154 of the 2019 NJDOT Standard Specifications for Road and Bridge Construction.

1.01.04 Method of Measurement and Payment

Item #	Description	Unit
1	Mobilization	LS

**1.02 CLEARING SITE**

1.02.01 Scope of Work

The Contractor shall furnish and deliver all material, labor, equipment, supervision and all else necessary and incidental to performing all specified and unspecified construction for site preparation, clearing and grubbing to include the following:

This Pay Item will be Lump Sum and will include all the work listed below for the site that is within the project scope. The Contractor will be responsible to visit the site and prepare a price for the Lump Sum pay item for bidding purposes.

- (a) Remove landscape and hardscape items located within the work zone, without damaging said items. Carefully relocate the items out of the work zone on the owner's property for resetting after construction has been completed.

- (b) Visit the work zones and record the extent of concrete curbs, walks, landscape and hardscape items that may be within the work zone, and that will require temporary removal, storing and resetting when the job is finished. There is no specific payment for special services to temporarily remove and reset private landowner landscaping and hardscape items.
- (c) Clear out and prepare the prescribed storage and lay-down areas, equipment staging areas, construction trailer areas, and portable lavatory areas.
- (d) Clearing, grubbing, removal and disposal of shrubs, bushes, weeds, roots, and similar vegetative material, whether standing or felled, for which payment is not otherwise provided in the Contract. No trees shall be removed by the contractor unless directed by the Engineer.
- (e) Removal and disposal of structures or other obstructions above existing ground level either standing or felled which are designated for removal on the plans or directed by the Engineer during construction and for which payment is not otherwise provided in the Contract.
- (f) Remove and trim any limbs or branches hanging over into the perimeter road that is in direct conflict with the milling machine and paving crew, including the triaxle when the dump is in up position.
- (g) Maintaining the existing condition of the paved perimeter road that will be exposed to construction vehicle traffic.

Remove and trim any limbs and branches hanging over the work zone that are in the way of excavators.

Any removal of limbs, grubbing activities, or tree remains shall be the responsibility of the Contractor to dispose of properly.

- (h) The Contractor shall not clear any trees, brush or ground cover that is within the Wetlands Buffer zone and/or the Riparian Buffer zone that is mapped on the Construction Plans.
- (i) Contractor shall make all reasonable efforts to protect landscaping and hardscaping items that are not in conflict with milling, paving, fine grading, or reservoir slope stabilization operations.
- (j) Removal, temporary storage or resetting, if required, of site features including signs, fences, wooden guide rails, lamp posts, benches, trash cans, hedges, trees or shrubs whether specified or unspecified on the plans or as directed by the Engineer. OWNER SHALL NOT PERMIT ANY MORE RAIL REMOVAL THAN A TOTAL OF 300 LINEAR FEET FOR THIS CONTRACT.
- (k) Remove small rocks as necessary to be able to tuck under the blanket and be able to grout in place. THE REMOVAL OF LARGE ROCKS SHALL NOT BE PERMITTED.

Bidder must visit site and note all site features including wooden guiderail, lamp posts, benches, trash cans and hardscaping that should be relocated during the milling, paving, excavation, or any other work necessary to complete the main reservoir stabilization. For example, a number of lamp posts, benches, and trash cans will be in conflict with construction traffic; they must be removed temporarily. All site features removed shall be placed neatly on the property of the owner.

- (l) Contractor is responsible for the protection of any underground utilities and/or overhead utility lines while completing the work required in this contract. If any damage is caused to the overhead utility lines and/or underground utilities while performing work required by this contract, the Contractor will be responsible for contacting the service provider and will be responsible for the cost of the repair.

#### 1.02.02 Materials

Materials shall conform with Section 201.02 of the NJDOT Standard Specifications for Road and Bridge Construction, 2019, or as amended. Miscellaneous Materials: At Contractor's option subject to the approval of the Engineer. Any and all traffic control devices, including but not limited to cones, signs, barricades etc., shall be in accordance with Traffic Control Standards. See Section 108.07 Traffic Control for further specifications.

#### 1.02.03 Methods of Construction

All Site Preparation, Clearing and Grubbing methods shall conform to Section 201 of the NJDOT Standard Specifications for Road and Bridge Construction, 2019, or as amended. In addition, the Contractor shall do the following:

- (a) Clear the project site within the limits of construction shown on the plans, or as directed by the Engineer. It is the intention of the plans to clear only those portions of the site that are absolutely necessary and essential for construction.
- (b) The Contractor shall never disturb an environmentally sensitive area's surface at all.
- (c) Purchase tree safety fence and posts and place around specimen trees within close proximity to the work zones or travel areas where large DJB dump trucks and Front End Loaders will be driving.
- (d) Repair all injuries to bark, trunk, limbs and roots or remaining plants by properly dressing, cutting, tracing, and painting using approved tree surgery methods, tools and equipment.
- (e) Clear designated areas of brush, weeds, roots, debris and other unsuitable material.
- (f) Prior to commencement of construction, the Contractor and Engineer will meet in the field to determine if and where vegetation removal is required for staging of materials and/or access to the reservoir repair area.
- (g) Dispose of accumulated waste materials in accordance with applicable State regulations.
- (h) Rough grade all grubbed and cleared areas and provide temporary stabilization as required per soil erosion and sediment control plan.

Protection: Roads, structures, pavement areas, grass or landscaping to remain shall be protected by Contractor in a manner approved by the Engineer.

- (a) Whenever possible, excavation shall include the removal and storage of topsoil from the site for future use. The length of time of ground disturbance shall be reduced to the minimum practicable, especially in environmentally critical areas. Ground disturbances shall be avoided until immediately preceding construction to minimize exposure of soils. In all cases the Contractor shall conform to SCS Standards for temporary soil erosion and sediment control.
- (b) Signs, fences, guiderails and other obstructions that are to be temporarily removed or reset shall be properly stored and protected until they are permanently reset. The Contractor shall exercise care in the removal, storage and resetting of the structures. Any damage to the materials or structures as a result of the Contractor's carelessness shall be repaired or replaced by the Contractor at no additional expense to the Owner.
- (c) Existing underground utilities and above ground utility poles which may be encountered shall be secured and protected from damage by the Contractor, during construction. The cost for protection, relocation or resetting shall be included in the lump sum price for this item – Clearing Site.

The Contractor shall assure that all discharges from dewatering activities to surface waters, wetlands or storm sewers shall be free of sediment. The Contractor shall use reasonable care to assure that no damage is done to vegetation by excessive watering or by damaging silt accumulation in the discharge area.

- (a) The Contractor shall use methods such as sedimentation basins, hay bales, silt fences, stone filters, etc., to achieve the desired result.

Under the Clearing Site item, the Contractor shall remove UP TO 12-inch section horizontally of SMALL ROCKS ONLY along the water line of the reservoir, where the rock fill meets the sand layer. Contractor is permitted to remove portion of sand layer while maintaining a 6-inch buffer between the sand and the filter fabric layer below to obtain tuck of fabric underneath the rock. Removal of said 12-inch horizontal section shall continue around the entire perimeter of the reservoir.

1.02.04      Method of Measurement and Payment

Cost for Clearing Site shall be included in the Lump Sum Bid Price ‘Clearing Site’.

The quantity for Clearing Site for which payment will be made will be a lump sum basis covering all the work noted on the plans, as herein specified, or as directed by the Engineer, and for which payment is not provided under other scheduled items of the proposal.

Also, the cost for insurance, bonds, and porta-pot shall be included in the lump sum price for this item.

<u>Item #</u>	<u>Description</u>	<u>Unit</u>
10	Clearing Site	LS

**1.03      SOIL EROSION ITEMS**

1.03.01 Scope of Work

Under this item, the Contractor shall furnish and deliver all materials, equipment, labor, supervision and all else necessary and incidental for the installation and implementation of soil erosion measures in those locations as indicated on the plans, specified herein, or as directed by the Engineer.

1.03.02 Material & Classification

(a) SILT FENCE

Silt Fence shall conform to the detail as shown on the plans and in conformance with SCD requirements.

(c) INLET PROTECTION

Inlet Protection shall conform to the detail as shown on the plans, to SCD requirements, and to Section 158.02 of the 2019 NJDOT Standard Specifications for Road and Bridge Construction.

(d) TURBIDITY PROECTION SCREEN

The turbidity protection screen shall conform to the detail as shown on the plans and in conformance with SCD requirements.

Placement of the turbidity screen shall be close enough to the edge of water, so the crew may maintain the location easily and to prohibit the barrier from floating far out into the reservoir. The barrier should be designed and fabricated to be placed and anchored in roughly 2-ft to 3-ft of water depth; it will be essential to see where the anchors are placed, assuring the OWNER that there is at least 6-inches of good sand and stone beneath the anchor at all times.

The turbidity screen anchors must be designed in such a fashion to have no sharp edges, rounded corners, with no ability to puncture the 8-mil liner below the thin layer of sand / stone.

Submit a shop drawing showing the barrier design, height of the siltation filter liner, and the type of anchor that will best fit this situation.

Anchors should be provided every 20-ft, O.C. or less.

1.03.03 Methods of Construction

(a) HEAVY DUTY SILT FENCE

Silt fence material shall be HEAVY DUTY, NO EXCEPTIONS. Standard Silt Fence is not permitted. All posts shall be 2-inch x 2-inch Oak, and the fence shall be cut-in to prevent soil losses.

Silt Fence shall be installed downstream of proposed construction in areas indicated either on the Plan, within these specifications, or as directed by the Engineer.

Silt Fence shall be installed downstream of all stored materials and construction storage and

staging areas.

Bury a minimum of one foot of geotextile below grade.

Securely fasten geotextile to post, four to six fasteners per post.

Securely fasten ends of individual rolls of geotextile to a post by wrapping each end of the geotextile around the post twice and fastening geotextile to post, four to six fasteners per post. Splicing of individual rolls shall not be permitted at low points.

Where indicated or as required, silt fences shall be constructed. The Contractor shall remove silt build up as required to maintain the silt fence in good operating condition and shall remove the silt fence when it is no longer needed.

An option to two continuous lines of heavy-duty silt fence would be to furnish and install and maintain a silt sock, minimum diameter 6-inches, around the entire perimeter. Owner would consider this as an option, at no additional cost to the OWNER.

(c) INLET PROTECTION

For existing inlet structures, place geotextile under the grates, over the curb pieces, and extend a minimum of 6 inches beyond. Place No. 2 coarse aggregate behind each curb piece and on the geotextile to secure the fabric in place.

For existing or new inlets with curb pieces, wrap the geotextile around a piece of lumber. Place the lumber against the vertical opening to allow for flood overflow.

(d) TURBIDITY PROTECTION SCREEN

Turbidity screen shall be placed along the entire work limit within the reservoir.

At no point should any anchoring systems for the turbidity screen be allowed to make contact with the existing geomembrane.

1.03.04 Method of Measurement and Payment

Silt Fence will be measured on a linear foot basis and it shall be placed on an as needed basis at the discretion of the Owner and Engineer, unless required under another section within these specifications. The Contractor shall include the cost of any and all required silt fence under the specific pay items noted in the proposal.

Floating Turbidity Barrier will be measured on a linear foot basis and it shall be placed throughout the reservoir to prevent material from exiting the work limits. The Contractor shall include the cost of any and all required Floating Turbidity Barrier under the specific pay items noted in the proposal.

Inlet Protection will be measured on a unit basis and it shall be placed in areas indicated either on the Plan, within these specifications, or as directed by the Engineer. The Contractor shall include the cost of any and all required inlet protection under the specific pay items noted in the proposal, which price

shall include the cost of all materials, labor, equipment, etc. necessary therefore or incidental thereto for a complete and satisfactory installation.

<u>Item #</u>	<u>Description</u>	<u>Unit</u>
5	Inlet Protection	UN
6	Heavy Duty Silt Fence	LF
7	Turbidity Protection Screen, Complete	LF

#### **1.04 DUST CONTROL**

##### 1.04.01 Scope of Work

Contractor shall provide a water truck during all construction activities to provide dust control.

There will be no separate payment for providing a water truck for dust control. The cost of providing a water truck for dust control will be distributed in various pay items.

##### 1.04.02 Materials

Water truck capable of spraying water for dust control.

##### 1.04.03 Methods of Construction

All methods of dust control shall conform to 2014 Standards for Soil Erosion and Sediment Control in New Jersey, or as amended.

##### 1.04.04 Method of Measurement and Payment

There will be no separate payment for providing a water truck for dust control. The cost of providing a water truck for dust control will be distributed in various pay items.

#### **1.05 TRAFFIC CONTROL**

##### 1.05.01 Scope of Work

The contractor will be responsible to maintain a safe and efficient work zone and provide any needed flagmen out on the county highways at the entry points, during significant delivery times.

Traffic control shall be the sole responsibility of the Contractor.

##### 1.05.02 Materials

All materials, equipment, signs, barricades, devices, etc. shall conform to the specifications set forth in the "Manual on Uniform Traffic Control Devices for Streets and Highways," latest edition, and Section 159 of the NJDOT Standard Specifications.

##### 1.05.04 Method of Measurement and Payment



Traffic Control shall not be measured for payment. The cost for Traffic Control shall be distributed in various other pay items.

## **1.06 EXCAVATION**

### **1.06.01 Scope of Work**

Under this item, the Contractor shall complete a “survey” of existing material thickness (sand, gravel, etc.) over the existing geomembrane. Contractor shall mark/delineate areas both thicker and thinner than 8 inches (high and low areas) for visual recognition by the graders. The information will be used to establish GPS construction coordinates for protection of the geomembrane.

The Contractor shall not remove any sand from the reservoir site. All sand shall be re-graded and leveled to create an even sand layer thickness around the reservoir slope. Sand shall be a minimum of 8” to a maximum of 18” around the reservoir.

The Owner will NOT be removing any sand from the reservoir. Earthwork shall be performed to re-distribute and import sand as necessary to create a consistent sand thickness prior to placing the ucs mattresses.

In two areas noted on the plan, there currently does not exist a sand layer atop the geomembrane liner. The only material on top of the liner is ¾” stone. The Contractor shall be responsible to utilize excavated sand fill from other areas around the reservoir and place it in the two areas noted to create a 6-12” layer of sand fill on top of the existing stone. This work, labor, and all other incidentals shall be billed under the “relocated on-site sand” pay item. Extreme care should be taken while working in these areas. Any damage to the liner is the responsibility of the Contractor.

Under this item, the Contractor will complete excavation of any and all material as required within the project limits where the restoration of the job site is to be completed as specified herein, or as directed by the Engineer.

### **1.06.02 Materials**

The materials and/or classification shall conform to Section 202 of the NJDOT Standard Specifications for Road and Bridge Construction, 2019, as amended therein.

### **1.06.03 Methods of Construction**

Under the Excavation, Test Pit item, the Contractor shall excavate above the geomembrane by hand, using minimal tooling. No sharp or metal objects shall be permitted.

**Any work near the reservoir slopes will require complete ‘Disinfection’ of personnel and equipment.**

Contractor shall excavate test pits at 100-foot intervals both perpendicular to the impoundment slope and horizontally as shown on the construction plans or as directed by the Engineer.

This equates to a total of 230 cubic yards of potential test pits, by hand, including flags, and record keeping for the Owner.

Contractor shall measure sand/gravel thickness above the geomembrane and mark/delineate areas above 8-inch thickness and below 8-inch thickness as high and low areas, respectively. Delineation shall be done using colored flags on a grid pattern for visual recognition by the grading crew.

For calculation, each test pit shall be measured at a constant of 1-cubic foot, for each hand-dug test pit using a small hand shovel. So, each CY of test pit will consist of 27 hand dug testing points with associated flags and test report on a spreadsheet, for the inspector.

Under the Excavation, Unclassified item, the Contractor shall excavate all excess sand within the reservoir work limits after the fine grading operation has finished.

Contractor shall move the existing sand to create a depth of 8"-18". No sand shall be excavated from the site. Contractor MUST shift the sand efficiently and safely, without damaging the 40-mil liner, and eliminating any visible hills and valleys in the sand prior to placing the fabric form concrete mattresses.

Crew shall take special care to traverse the slopes with low pressure equipment, shaving off excess sands, and shifting the material slowly and efficiently, across the areas, using all material needed to prepare a layer between 8"-18" across the geomembrane. In no areas shall the sand layer be less than 6" thick or more than 18" thick.

The goal to have zero sand disposal.

Any excavated material shall be stockpiled on-site for NJDEP clean fill sampling & testing, as required by the receptor(s) of the material. Once approvals have been obtained, the material shall be disposed of off-site. Contractor shall provide all documentation to the owner.

Contractor shall implement all soil erosion and sediment control measures as indicated in section 1.03 of these specifications, on the plans, or as directed by the Engineer.

Contractor shall take care to limit the amount of vehicle and equipment traffic on the existing geomembrane. At no time shall equipment or personnel come in direct contact with the existing geomembrane. A minimum 6-inch layer of sand/gravel shall be maintained at all times between any traffic and the existing 40-mil geomembrane.

Path driven by vehicles and equipment on top of the geomembrane shall be straight as possible with no sharp turns, sudden stops, or quick starts. Equipment driving down-slope shall be kept to a minimum.

Contractor shall only permit low ground pressure vehicles and equipment on top of the geomembrane. Contact pressure of any and all vehicles or equipment shall be less than 7 PSI. Tracked equipment grousers shall be less than 2 inches in height.

Any damage caused to the geomembrane liner as a result of the carelessness of the Contractor shall be repaired by the Contractor at no cost to the owner.

1.06.04      Method of Measurement and Payment

The quantity for test pit excavation will be measured by the cubic yard.

The quantity for excavation unclassified will be measured by the cubic yard.

The Engineer or the Engineer's representative must be present during excavation activities to determine and record the limits of excavation. Any over excavation completed without the supervision of the Engineer or the Engineer's representative will not be considered for payment.

Each hole will be measured in neat lines to calculate a specific volume of hole when complete.

<u>Item #</u>	<u>Description</u>	<u>Unit</u>
11	Excavation, Test Pit (IAWD)	CY
13	Excavation, Unclassified (IAWD)	CY

**The cost for hand digging, setting flags and recording sand depths in a spreadsheet for the Owner should be included in the CY unit price for Test Pits Above. Every 27 test pits will be as one (1) cubic yard of measure.**

**1.07    CONSTRUCTION LAYOUT**

1.07.01      Scope of Work

Under the Construction Layout item, the Contractor shall furnish and deliver all materials, equipment, labor, supervision and all else necessary to layout the equipment and lay down areas for the permanent slope stabilization and restoration. These areas shall be indicated on the plans, specified herein, or as directed by the Engineer.

The cost to haul stone materials to the site shall be included in this item.

1.07.02      Methods of Construction

**Construction Layout:**

Colliers Engineering & Design, Inc. will be responsible for confirming field controls with the contractor prior to start of construction.

All benchmarks from Colliers' survey have been included on the construction plans but Colliers will confirm these locations.

1.07.03      Method of Measurement and Payment

The quantity for Construction Layout for which payment will be made will be a lump sum basis covering all the work noted on the plans, as herein specified, or as directed by the Engineer, and for which payment is not provided under other scheduled items of the proposal. All costs associated with laying out grades as shown shall be included with this pay item.

Item #	Description	Unit
3	Construction Layout	LS

## **1.08 STONE & AGGREGATE**

### 1.08.01 Scope of Work

This section shall pertain to the following materials to be used under this contract:

a)  $\frac{3}{4}$ " Clean Stone

The Contractor may need to use clean stone for stabilization, access drives, etc. This is if and where directed.

b) DGA Base Course, 6"

The contractor shall be required to purchase the DGA Base Course for the perimeter roadway. The Contractor shall include labor, equipment, supervision, and all else necessary and incidental to performing under the specifications contained herein.

### 1.08.02 Materials

All DGA base course shall be provided and placed to conform to the NJDOT Standard Specifications for Road and Bridge Construction 2019, or as amended.

### 1.08.03 Methods of Construction

The Contractor shall furnish, deliver and install imported soil materials to augment existing material on site. IAWD material to be furnished shall be by written authorization of the Engineer.

Stockpile soils materials in sufficient quantities in designated areas on the site to meet the project schedule and requirements.

Separate differing materials with dividers or stockpile apart to prevent intermixing or contamination.

Direct surface water away from stockpiles to prevent erosion or deterioration of materials.

Install materials at those locations and to those thicknesses as indicated on the plans, specified herein, or as directed by the Engineer.

Material shall be evenly distributed and compacted in 6"-10" lifts.

A.  $\frac{3}{4}$ " Clean Stone (IAWD)

The Contractor shall place the  $\frac{3}{4}$ " stone uniformly to the limits and depth as indicated on the plans, specified herein, or as directed by the Engineer. Once placed, the material shall be shaped and compacted to the typical cross sections as noted. The Contractor shall allow for losses, shrinkage and compaction in the unit price bid.

The Contractor shall take care during the placement of the ¾” stone, not to allow foreign materials to become intermingled with the stone. The ¾” stone must remain clean. The Contractor will be required to remove any stone that is not clean.

Furnishing of ¾” Clean Stone shall be if and where directed by the Engineer.

**B. DGA Sub-base**

The Contractor shall place the dense graded aggregate within the designated areas on the plans or as directed by the Engineer in said areas once the excavation & grading operation has been completed. Once placed, the material shall be shaped and rolled to the typical cross sections as noted and rolled to the satisfactory compaction as stipulated in the NJDOT Standard Specifications for Road and Bridge Construction, 2007, or as amended. The Contractor shall allow for losses, shrinkage and compaction in the unit price bid.

**1.08.04 Method of Measurement and Payment**

The quantity of ¾” Clean Stone for which payment will be made will be by the Cubic Yard, IAWD.

The quantity for DGA for which payment will be made will be by the square yard.

The Contractor must provide certified slips for all soil materials delivered to the job site. Unit price shall include the cost of all materials, storage, labor, equipment, etc. necessary therefore or incidental thereto.

<u>Item #</u>	<u>Description</u>	<u>Unit</u>
16	¾” Clean Stone (IAWD)	Ton
A-6	DGA Base Course, 6” Th. (IAWD)	SY

**1.09 HMA MILLING, 3” OR LESS**

**1.09.01 Scope of Work**

Under this item, the Contractor shall furnish and deliver all materials, equipment, labor, supervision and all else necessary and incidental for the variable depth milling of the existing pavement in locations damaged by construction traffic or other means incidental to the completion of the work in this contract.

Once the reservoir slope stabilization construction has been completed, the Contractor and Engineer will meet in the field to determine if and where variable depth milling is required to repair the reservoir paved areas.

**Base Repairs:**

In addition, cut-down specific paved sections, as noted on the plans or directed by Engineer as ‘base repair,’ four (4) inches, for the placement of HMA Base Course.

All milling is paid once per square yard of road; Owner will authorize deeper cuts in the field prior to milling crew mobilizing on said roadway.

The entire roadway surface shall be milled, where in some instances, the center and quarter-crown will only be scarified, leaving the existing structure, if stable. If surface is unstable after the reservoir slope stabilization is complete, then the Engineer will direct that milling machine pass-down to at least 2-inches for full depth HMA removal, and then place leveling course or base course.

At inlets, mill around frames to allow for a minimum of 2-inches of HMA placement.

At limits of work, mill a key-joint, 2-inches deep, square and vertical. In some instances, a 3-inch deep key-joint may be necessary.

All joints must be sealed with Hot AC-20 cement, edges and surfaces.

All milling is considered 'variable depth,' and Owner will direct the superintendent in the field what depth of milling shall be used at specific areas of the road. In some instances, the crown and quarter-crown may only be scarified, removing the polish, nearly ½" depth.

#### 1.09.02 Materials

The materials shall conform to Section 202 of the NJDOT Standard Specifications for Road and Bridge Construction, 2019, or as amended.

#### 1.09.03 Methods of Construction

Construction for this item shall comply with section 401.03.01 of the NJDOT Standard Specifications for Road and Bridge Construction, 2019, or as amended.

### **HAULING AWAY OF UNSUITABLE SOILS AND MILLINGS:**

*All excess clean excavated material is the property of the Contractor*

*All millings shall become the Contractor's property and will be the Contractor's responsibility to properly remove and dispose of the material.*

#### 1.09.04 Method of Measurement and Payment

The quantity for the item Milling, Variable Depth (as specified above) for which payment will be made will be per square yard based on as-built quantities. This item will be measured; the Contractor will be paid for the quantity completed.

The price shall include, but not necessarily be limited to, the cost of providing all materials, saw cutting, milling, scarification, pulverization, excavation, disposal of excess material, redistribution, rough and fine grading, compaction and all else as above described, including all labor, equipment, supervision and all else necessary therefore and incidental thereto for a complete and satisfactory installation. Included within these pay items shall be compaction testing as specified herein.

<u>Item #</u>	<u>Description</u>	<u>Unit</u>
A-3	HMA Milling, 3" or Less	SY

## **1.10 HOT MIX ASPHALT COURSES**

### **1.10.01 Scope of Work**

Under this Section, the Contractor shall furnish, deliver and install all materials, equipment, labor, supervision, and all else necessary and incidental to install the specified thickness of Hot Mix Asphalt (HMA), Surface and Base Courses within the roadway and parking areas in locations damaged by construction traffic or other means incidental to the completion of the work in this contract.

Included in these items shall be all surface preparation and cleaning of existing surfaces, saw cutting and tack coat as may be required per the NJDOT Standard Specifications or as specified herein.

Once the reservoir slope stabilization construction has been completed, the Contractor and Engineer will meet in the field to determine if and where variable depth milling is required to repair the reservoir paved areas.

At the terminus of the project, inspect and mark out the limit of milling and paving at both ends. Do not change the gutter line.

All finished joints shall be coated on the surface of the cut and on the top with Hot AC-20 Asphalt Cement.

**CRCG shall be prohibited in the top layer of HMA Surface Course.**

**GLASS & LIMESTONE ROCK MATERIAL IS HEREBY PROHIBITED FROM THE HMA MIX DESIGN.**

Included in this item shall be all surface preparation and cleaning of existing surfaces, saw cutting and tack coat as may be required per NJDOT Standard Specifications specified herein.

All areas shall be tack-coated before topping.

The quality of materials and performance of the work specified in this section shall be in accordance with Section 401 of the NJDOT Standard Specifications for Road and Bridge Construction, 2019, or as amended.

**ALL JOINTS SHALL BE COATED WITH POLYMERIC JOINT ADHESIVE (PJA), AND THE COST THEREOF SHOULD BE INCLUDED IN THE UNIT PRICES FOR HMA ITEMS.**

### **1.10.02 Materials**

All material, labor, equipment and supervision shall be furnished by the Contractor.

- (a) Provide HMA 25M64 Base Course
- (b) Provide HMA 9.5M64 Surface Course

Job mix formula requirements: The Contractor shall submit to the Engineer a copy of the job mix formulas or mix designs. The job mix formula or mix design shall be submitted in a minimum of five (5) working days prior to the placing of any pavement material. No placement of any material for which a job mix formula or mix design has not been submitted to and approved by the Engineer shall be permitted.

Mix design and control requirements: The design and control requirements for all paving mixtures shall conform to Section 902, of the NJDOT Standard Specifications.

Materials shall be in accordance with 401.02.01 of the NJDOT Standard Specifications.

### 1.10.03 Methods of Construction

The construction standards of Section 401 of the NJDOT Standard Specifications for Road and Bridge Construction, 2019, or as amended shall apply.

- (a) Contractor shall notify all utility companies prior to construction. Prior to any excavation, the Contractor will thoroughly familiarize himself with those areas that are to be excavated as indicated on the plans and at the direction of the Engineer. If there are any questions as to any changes in those areas, they shall only be changed by requesting such changes and receiving approval of the Engineer as called for in the specifications.

It will be the Contractor's responsibility to raise or lower any and all manhole frames and covers, inlet grates and valve boxes to grade and replace them if they are damaged during excavation. The areas shall be excavated to the depth necessary to provide the previously determined contour or cross-section of the street. This excavated material shall be completely disposed of by the Contractor, hauled at the Contractor's expense to be disposed of in compliance with applicable State, County or Local regulations.

- (b) Milling shall only be done if the paving crew is mobilized and ready to start paving immediately the next day; failure to comply will result in a shut-down of the project until specification may be attained by the Contractor.
- (c) The sub base shall be properly shaped and graded in order to receive the stabilized base course. The sub grade shall not be prepared when it is unstable because of excessive moisture. The sub grade shall be shaped and compacted, and when finished, it shall conform to the required sub grade and contour. The sub grade shall be shaped and smoothed to correct ridges and other surface irregularities caused by the compaction equipment or otherwise and shall be well compacted by smooth steel 3-wheel power rollers, weighing not less than 330 pounds per linear inch of tread of the rear wheels.
- (d) If the time period between installation of the stabilized base course and the laying of the surface course is in excess of three (3) days or in the opinion of the Engineer is excessive whereby settlement or other irregularities with the surface occur prior to surface course installation, then the Contractor shall mill and/or add additional material and compact as hereinbefore specified. Any such additional material shall be supplied at the Contractor's expense.



- (e) The paving machine shall be equipped with a heated, vibrating screen in proper working condition, free of any particles or dried on aggregate or asphalt cement.
- (f) Two (2) vibratory rollers of at least twenty (20) tons and ten (10) tons, shall be on the job at all times and shall be operated by a competent, experienced operator. A five (5) finish roller must be in operation at all times, not operated by the breakdown roller operator. No roller speed shall exceed 5-miles per hour at any given instance.

**Weather Limitations**

- (a) HMA mixtures shall only be placed when the combinations of lay down and base surface temperatures are within the limits shown in Table 401.03.03 of the NJDOT Standard Specifications, when it is not raining and when the sub base is in satisfactory condition.
- (b) For other than surface courses, in case of sudden rain, the placing of mixture then in transit from the plant may be permitted, if laid at proper temperature and if the base is free of pools of water. Such permission shall in no way waive any of the requirements of the specifications.
- (c) Lay down temperature will be measured in the receiving hopper of the paver.

**1.10.04      Method of Measurement and Payment**

For all items in this section prices shall include, but not necessarily be limited to, the cost of providing all materials as above described, cost of all excavation, surface preparation, saw cutting, placing and rolling of HMA material, including all labor, equipment, supervision and all else necessary therefore and incidental thereto for a complete and satisfactory installation.

Payment for HMA 25M64 Base Course, 2” thk and HMA 9.5M64 Surface Course, 2” thk will be made on a tonnage basis unless otherwise noted. Payment for the HMA Driveway item will be made on a square yard basis unless otherwise noted. Certified load slips are required.

<u>Item #</u>	<u>Description</u>	<u>Unit</u>
A-4	Hot Mix Asphalt 25M64, Base Course (IAWD)	TN
A-5	Hot Mix Asphalt 9.5M64 Surface Course	TN

**1.11      TACK COAT**

**1.11.01      Scope of Work**

Under this item, the Contractor shall furnish all material, equipment, labor, supervision and all else necessary to apply tack coat to a cleaned and prepared road surface in accordance with Section 401.03.02 of the NJDOT Standard Specifications for Road and Bridge Construction, 2019 or as amended.

**1.11.02      Materials**

Contractor shall use SS-1 tack coat for all within the roadway. Tack coat shall be applied in accordance with Section 401.03.02 of the NJDOT Standard Specifications for Road and Bridge Construction, 2019 or as amended.

#### 1.11.03 Methods of Construction

Apply to cleaned surfaces of all pavements to be overlaid. Failure to sweep entire road free from debris, sand, and dust may result in rejection of pavement placement.

Apply to cleaned surfaces of newly constructed base pavement if coated with dust, dirt, foreign materials in sufficient amount to create bond with surface course paving as determined by Engineer.

Apply to edges of paving where base repairs are to be made.

Apply tack coat material at temperatures, and observe safety precautions, specified in Section 401.03.02 of the NJDOT Standard Specifications for Road and Bridge Construction, or as amended. Pure emulsion water based tack is prohibited.

Apply at rate of 0.10 gallon per square yard as directed by Engineer, immediately prior to placing pavement.

Apply tack coat by spray or brush to contact surfaces of pavement cold joints, curbs, gutters, manholes, and other structures protecting into or abutting asphalt concrete pavement.

Allow surfaces to dry until material is in a condition of tackiness to receive pavement.

Apply PJA as per the standard specification as written in the Standard Specifications. Coat vertical surfaces to assure proper adhesion between mats.

#### 1.11.04 Method of Measurement and Payment

The cost of providing all labor, equipment, and material needed to establish a safe work zone, provide cleaning equipment, proper supervision, trained labor, removal, and all else necessary to provide uniform tack coat will be included in the unit prices for "Hot Mix Asphalt 25M64, Base Course (IAWD)" and "Hot Mix Asphalt 9.5M64 Surface Course".

### **1.12 SAW CUTTING**

#### 1.12.01 Scope of Work

Under this item, the Contractor shall furnish and provide all tools, supervision, etc. to saw cut any asphalt to make a rectangular box.

Once the reservoir slope stabilization construction has been completed, the Contractor and Engineer will meet in the field to determine if and where Saw Cutting is required to repair the reservoir paved areas.

#### 1.12.02 Materials

The Contractor shall provide all tools and equipment need to operator the demo saw including the saw itself, the personnel to use the equipment, supervisions, saw blades, water to keep the dust down and all else necessary to complete the task in a clean and orderly fashion.

#### 1.12.03 Methods of Construction

The contractor shall first measure out the area to be cut and mark it using spray paint to ensure the cutter knows the limits of cutting. The Owner will not be responsible for any length of cuts that are outside of the marked areas approved and accepted by the Engineer.

Saw-cutting will include the following types of cutting:

- a. Transverse joints in pavement limits for resurfacing.
- b. Saw cut lines for removal of concrete slabs.

The cutter will then use a demo saw to cut the area with straight clean lines. The saw shall have a water attachment on the blade with a hose hooked up and water running at all times while cutting to keep the dust down. The cutter shall also be using all safety equipment that is approved by OSHA standards while using a demo saw.

#### 1.12.04 Method of Measurement and Payment

There will be no separate payment for providing Saw Cutting. The cost of Saw Cutting will be included in the square yard price for “HMA Milling, 3” or less (IAWD)”.

### **1.13 FINE GRADING**

#### 1.13.01 Scope of Work

Contractor shall use this item to grade the sand fill to provide a 8-18” sand layer across the entire reservoir slopes and ledge. The finished depth of the sand layer will be and is expected to have slight variation. However, the Contractor shall make best efforts to keep the sand layer uniform across the side slopes and ledge. No sand is to be removed from the site area.

At no point shall the 8” concrete filled mattress finished elevation be lower than the 4” concrete filled mattress finished elevation.

#### 1.13.02 Materials

The materials and/or classification shall conform to Section 202 of the NJDOT Standard Specifications for Road and Bridge Construction, 2019, as amended therein.

#### 1.13.03 Methods of Construction

In areas where of small rocks have been removed, and after high and low points have been delineated and marked as per section 1.06.03 of these specifications, Contractor shall begin grading operation of the sand/gravel over the geomembrane, using low ground pressure vehicles and equipment.

Contact pressure on the geomembrane from any and all vehicles or equipment shall be less than 7 PSI. Tracked equipment grousers shall be less than 2 inches in height.

The grading operation shall be generally sequenced from the bottom reservoir work limit to the top. It shall be the Contractors responsibility to verify the depths of sand in various locations throughout the reservoir. The Contractor shall be required to maintain a minimum 8” of sand on all ledges and reservoir slopes within the work area. If necessary, the Contractor may retain a deeper finished depth of sand up to a maximum of 12”.

The Contractor shall provide fine grading as to not create abrupt differences in the sand layer. Any variations in the final depth of sand shall be gradual and low slope.

The Contractor shall make all attempts to keep the finished elevation of the 4” mattress and the 8” mattress at the joint at the same elevation. If necessary, the 8” mattress on the ledge can be slightly above the 4” mattress. At no point shall the finished elevation of the 4” mattress ever exceed the 8” mattress finished elevation.

There are two areas within the reservoir that do not currently have a sand layer above the liner. These areas are anticipated to be filled with ¾” stone. The Contractor shall place a sand layer on top of the existing stone to the depth specified on the plans, state herein, or otherwise specified by the Engineer. Extreme care shall be taken when dumping sand in these areas. The Contractor shall not dump sand from a height that could cause the pressure on the stone to puncture the liner. The Contractor shall also not be permitted to run equipment over the stone prior to the placement of a minimum of at least 6” of sand. The depth shall be verified prior to any equipment driving over the stone areas. All work associated with placing sand in these areas and any and all other incidentals resulting from the placement of fill shall be billed under “relocated on-site sand”. All fine grading shall be billed under that pay item.

Any damage to the liner in these areas is the responsibility of the Contractor and shall be repaired at no additional cost to the Owner.

1.13.04 Method of Measurement and Payment

The quantity for Fine Grading will be measured and paid by the square yard.

<u>Item #</u>	<u>Description</u>	<u>Unit</u>
15	Fine Grading	SY

1.15 SITE RESTORATION

1.15.01 Scope of Work

Under this item, the Contractor shall furnish all materials, equipment, and labor necessary to the resetting and/or replacement of site features removed or damaged under the “clearing site” item in this job as shown on the plans or as directed by the Engineer.

Under this item, the Contractor shall furnish all materials, equipment, and labor necessary for topsoil placement, fine grading, seeding, and mulching after construction has been completed, top restore the work site to pre-construction conditions.

The Contractor shall replace all site features removed and stored prior to construction. Site features damaged by the contractor such as wooden guide rail, signs, trash cans, benches, etc. shall be replaced by the Contractor at no cost to the Owner.

The Contractor shall remove and reset all timber 6” posts, to existing height when finished. If the timber rails are in good condition, the contractor shall reset said timber rails, using the existing fasteners. However, if the rails and fasteners are rotted or beyond useful life, then the contractor shall not reset said timber rails, and the owner will finish the replacement and mounting of the rotted, deteriorated timber.

Contractor shall not be responsible for the cost of replacing site features, including wooden guide rail, signs, benches, etc. that are discovered to be damaged through natural causes. The Owner agrees to pay for the replacement of previously damaged site features including, but not limited to rotted wood guard rail, rotted signs, rusted benches, etc.

#### 1.15.02 Materials

The materials and/or classification shall conform to Section 202 of the NJDOT Standard Specifications for Road and Bridge Construction, 2019, as amended therein.

#### 1.15.03 Methods of Construction

At the end of the 6-month slope restoration clock, after permanent slope stabilization construction has been completed, the BTMUA shall resume operational control of the reservoir. The BTMUA will commence refilling of the reservoir.

At this time, the Contractor shall remove turbidity protection screen and construction access ramps from the fill zone.

The Contractor shall restore the rock fill zone to pre-construction conditions.

The shoreline restoration must be completed by April 1, 2026, as noted in the CONTRACT; failure to complete all in-water activities and full shoreline restoration may be cause for liquidated damages.

The Contractor shall then begin repairs of the perimeter roadway, per the construction details. This shall include the removal and disposal of existing roadway materials (asphalt, soils, etc.), boxing out of new roadway section, and placement & compaction of aggregate base and asphalt pavement courses.

The Contractor shall complete topsoil placement as needed, fine grading, seeding, and mulching along the perimeter roadway.

The Contractor shall dismantle construction staging areas and restore to pre-construction conditions (topsoil placement, fine grading, seeding, and mulching)

Site features removed under the “Clearing Site” item in these Specifications shall be reset under this item. Contractor shall be responsible for restoring all features of the work site to pre-construction conditions.

As noted in Agreement, Restoration, milling and paving, repairs to rock perimeter, grass growth, etc. may be completed after the April 1<sup>st</sup> Deadline, but shall be complete by May 1, 2026.

#### 1.15.04 Method of Measurement and Payment

The quantity for Restoration, Complete shall be Lump Sum and will not be measured for payment.

<u>Item #</u>	<u>Description</u>	<u>Unit</u>
22	Restoration, Complete	LS

### **1.16 FINAL CLEANUP**

#### 1.16.01 Scope of Work

Under this item, the Contractor shall furnish and provide all tools, supervision, etc. to clean the Project Limits, to the RE’s satisfaction, of rubbish, excess materials, temporary structures, and equipment. Include borrow source areas, and equipment and material staging areas occupied in connection with the Work.

At Final Clean-up the contractor will be required to prepare and submit as-builts of the work completed.

#### 1.16.02 Materials

The Contractor shall provide all tools and equipment needed to clean up the work site after construction and restoration has been completed. The Contractor shall provide all else necessary to complete the task in a clean and orderly fashion.

#### 1.16.03 Methods of Construction

Pre-construction videos shall be taken of the proposed work site prior to mobilization.

After construction and site restoration has been completed, the Contractor shall be responsible for leaving the site in the condition it was prior to any construction activities as outlined in these Specifications.

Final Cleanup shall be to the RE’s satisfaction. Contractor and Engineer shall meet in the field to discuss Final Cleanup measures.

#### 1.16.04 Method of Measurement and Payment

The quantity for Final Cleanup shall be Lump Sum and will not be measured for payment. There is no specific payment for creating an As-Built Plan.

Item #	Description	Unit
23	Final Cleanup	LS

**1.17 TOPSOIL, FERTILIZER, & SEED**

1.17.01 Scope of Work

Under this Section, the Contractor shall furnish all materials, labor, equipment, etc. necessary to excavate, regrade the subbase, place, grade and level topsoil; lime and fertilize topsoil to form a suitable seed bed; and install seed on all disturbed areas as indicated on the plans, specified herein, or as directed by the Engineer.

Once the reservoir slope stabilization construction has been completed, the Contractor and Engineer will meet in the field to determine if and where Topsoil, Fertilizer, & Seed is required to restore the reservoir area to its original condition prior to construction.

The Contractor is required to import topsoil new topsoil to restore those disturbed areas, at no additional cost to the OWNER.

The cost associated with furnishing restoration topsoil, seed, mulch and fertilizer should be included in the LS price bid for Restoration, Complete in the Proposal.

1.17.02 Materials

A. Topsoil: The topsoil shall be friable and loamy, free of debris and objectionable weeds and stones, and contain no toxic substance that may be harmful to plant growth. The topsoil shall comply with subsection 917.01 of the NJDOT Standard Specifications for Road and Bridge Construction, 2007 or as amended.

B. Fertilizer and Lime

1. Fertilizer
  - a) 10-20-10 Commercial designation Subsection 917.03
  - b) 5-10-10 Commercial designation
2. Pulverized dolomite limestone Subsection 917.04

C. Seed

1. The material used under this Section shall be a NJDOT grass seed mixture Type A, in the proportion listed below or as specified by the Engineer.
2. Seed mixture shall be labeled to show compliance with the requirements of the New Jersey State Seed Law and shall have been tested within 6 months preceding the date of sowing. The kinds and amounts shall be as indicated:

Type A-4 Grass Seed Mixture (400 pounds per acre)

Kind of Seed	Minimum Purity, %	Minimum Germination, %	% of Total Weight of Mixture
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Tall Fescue	95	80	60
Kentucky Bluegrass	85	75	10
Chewing or Hard Fescue	95	85	20
Perennial Ryegrass	98	85	10

1.17.03 Methods of Construction

After the subbase is properly compacted and yard area graded to a proper slope acceptable to the Engineer and property Owner, the Contractor shall be required to place the topsoil on the prepared subbase.

The Contractor can use the topsoil stripped from the existing lawn area if tested and deemed acceptable for use as per the NJDOT standards.

The Contractor shall utilize that suitable topsoil previously stripped and stockpiled as part of the work completed under site preparation. Additional topsoil shall be provided by the Contractor if there is no a sufficient quantity of existing material available to fulfill the requirements of these specifications. The cost of the topsoil to be provided shall be included in the unit price bid within this item. The Contractor shall familiarize himself with the existing site conditions in considering this Section.

The Contractor may mechanically screen to remove all particles greater than 3/4" through a mechanical screening device. The Contractor shall then stockpile the screened material in a manner as to aid the redistribution of topsoil to the disturbed areas.

The areas to be seeded shall be raked, graded and smoothed to an even surface, free of stones, rocks, etc. The Contractor shall apply 90 pounds per 1000 square feet of pulverized dolomite limestone tilled into the entire bed area.

The Contractor shall apply a 10-20-10 fertilizers or equivalent at the rate of 12 pounds per 1000 square feet to be tilled into the entire bed.

The lime and fertilizer shall be worked into the soil as nearly as practical to a depth of 4" with a disc, spring-tooth harrow or other suitable equipment. The final harrowing or disking operation should be on a general contour. Tillage shall continue until a reasonable uniform, fine seedbed is prepared.

Immediately prior to applying the seed the Contractor shall apply a 5-10-10 fertilizer or equivalent at the rate of 2 pounds per 1000 square feet to be worked into the soil as nearly as practical to a depth of 1".

The Contractor shall remove from the surface all objects that would prevent good soil contact shall remove all other debris such as wire, stones, cable, tree roots, pieces of concrete clods, lumps or other unsuitable material.

Prior to applying the seed, the site shall be inspected. If traffic has left the soil compacted, the area must be retilled and firmed as described above.

The seed mixture may be applied by hand, cyclone seeder, drill cultipacker or hydro-seeder. The seed must be uniformly applied at a rate of 7.0 pounds per 1000 square feet and placed to a depth of 1/4 to 1/2 inch.



All hand seeding shall be lightly raked and rolled to cover the seed. Hydro-seedings which are mulched may be left on the surface.

Hydraulic seeding equipment shall be approved by the Engineer.

The Contractor shall apply mulch to all newly seeded areas immediately following seeding and to all disturbed areas if stabilization by seeding cannot occur as herein specified.

Mulching shall be performed as follows: Unrotted hay or small grain straw shall be spread uniformly at a rate of 2 tons per acre and anchored with liquid mulch binder or netting.

1. Synthetic or organic binder shall be applied at the manufacturer's recommended rate.
2. Combined wood cellulose fiber mulch/tack products shall be applied at a rate of 400 pounds per acre.

Mulch nettings may be used in place of liquid mulch binders. Mulch nettings shall be anchored by firmly stapling the netting into the soil over the straw or hay mulch. Regardless of the anchoring method employed, mulch anchoring shall be performed immediately after placement of the hay or straw mulch.

The Contractor shall complete as much of the seeding as possible from March 1 to May 31 and from August 15 to October 31, when weather and soil conditions are suitable therefore. If the Contractor misses the dates of August 15 to October 31 for seeding, then the areas will be mulched with unrolled small grain straw at a rate of 1.5 to 2 tons per acres with appropriate anchoring.

The Contractor shall supply water to the seed areas as may be required for a minimum of two weeks to assure proper growth.

Watering shall be performed as necessary until a firm root mass is established. Each watering shall be performed until water infiltrates through the root zone and into the topsoil zone. Watering shall be performed in a manner that provides equal distribution and coverage to all areas.

#### 1.17.04 Method of Measurement and Payment

The quantity of Topsoil, Fertilizer, & Seed for the type of restoration specified in accordance with the plans, as specified herein, or as directed by the Engineer will not be measured for payment.

The cost of providing all materials, stripping, stockpiling, storing, delivery and installation of materials, watering, etc., all as above described, including all labor, equipment, supervision, and all else necessary therefore and incidental thereto for a complete and satisfactory installation shall be included in the "Restoration, Complete" pay item.

### **1.18 ASPHALT AND FUEL PRICE ADJUSTMENT**

#### 1.18.01 Scope of Work

Under this section the Contractor's compensation shall be adjusted based on fluctuations in the cost for asphalt binder usage. Price adjustments may result in an increased payment to the Contractor for increases in the price index and may result in a reduction in payment for decreases in the price index.

#### 1.18.02 Method of Measurement & Payment

Allowance for Asphalt Price Adjustment has been written in by the Owner in the Allowance Price under Bid Item No. 2, as an allowance, not to be billed by the CONTRACTOR without express written authorization.

This item will not be measured; it will be paid for on an Allowance basis based on Section 160.03.02 of the NJDOT Standard Specifications for Road and Bridge Construction 2007 or as amended.

The Contractor shall only be compensated based on the weigh tickets furnished when paving activities are taking place. Weigh tickets shall be legible and clearly indicate the printed heading of the supplier and location of the plant, the title of the project for which delivery is intended, the time and date, truck number, mix number or material being furnished, and the total net weight in each truck load.

Fuel that is eligible for fuel price adjustment will be the sum of the quantities of the eligible Pay Items in the Contract times the fuel usage factors as listed below. The types of fuel furnished shall be at the option of the Contractor.

The fuel required for items not listed and for eligible Pay Items in the Contract that individually require less than 500 gallons of fuel will not be eligible for fuel price adjustment. If more than one Contract Pay Item has the same nomenclature but with different thicknesses, depths, or types, each individual Contract Pay Item must require 500 gallons or more of fuel to be eligible for fuel price adjustment. If more than one Contract Pay Item has the exact same nomenclature, similar Contract Pay Items will be combined and this total must then require 500 gallons or more of fuel to be eligible for fuel price adjustment.

If the as-built quantity of an eligible Contract Pay Item differs from the sum of the monthly estimates, and the as-built quantity cannot be readily distributed among the months in which the eligible Pay Item was constructed, then the as-built fuel price adjustment will be determined by distributing the difference in the same proportion as each monthly estimate is to the total of the monthly estimates.

<b>Eligible Pay Items</b>	<b>Fuel Usage Factor</b>
MILLING, 3" OR LESS	0.25 Gallons per Square Yard
HOT MIX ASPHALT	2.5 Gallons per Ton

For those Pay Items in which the pay unit differs from that which appears in the fuel usage factor, the appropriate conversion will be figured before applying the fuel usage factor. Fuel price adjustment will be determined on a monthly basis by the following formula:

$$F = (MF - BF) \times G$$

Where: F = Fuel Price Adjustment  
MF = Monthly Fuel Price Index  
BF = Basic Fuel Price Index

G = Gallons of Fuel Eligible for Price Adjustment

The monthly fuel price index, as determined by the Department, will be the average of the retail prices for No. 2 fuel oil and regular unleaded gasoline, as established by the New Jersey Department of Energy. The retail prices for No. 2 fuel oil and regular unleaded gasoline are based on the average of actual retail prices at various locations throughout the State.

The basic fuel price index will be the most recent monthly fuel price index before receipt of bids. Should a monthly fuel price index increase 50 percent or more over the basic fuel price index, no further work shall be performed on items eligible for fuel price adjustment without written approval from the Executive Director of Regional Operations. Should a monthly fuel price index decrease from the basic fuel price index, payments will be decreased accordingly.

Fuel price adjustment will be on a lump sum basis and an estimated amount to cover the fuel price adjustment has been included in the Proposal. Payments for increases will be made from this amount.

Fuel price adjustments will not be made in those months for which the monthly fuel price index has changed by less than five percent from the basic fuel price index.

**Fuel price adjustments will be limited to milling and paving operations only, no exceptions**

For bidding purposes there is an allowance for this item. All bidders shall receive the same allowance. This allowance is for bidding purposes only. The Contractor will be compensated based on the asphalt price adjustment calculations. The Contractor shall be required to submit a calculation for approval by the Engineer prior this item being authorized for payment.

<u>Item #</u>	<u>Description</u>	<u>Unit</u>
A-1	Fuel Price Adjustment	AL
A-2	Asphalt Price Adjustment	AL

## 1.19 SAND IN-FILL

### 1.19.01 Scope of Work

Under this item, the Contractor shall excavate, load up, relocate and place on-site sand fill within the two areas noted on the plans. This “relocated on-site sand” shall be placed and fine graded to meet the finished elevations specified within the plans, in the technical specifications, or otherwise noted herein.

Where required, the contractor shall import sand as necessary to reach the minimum uniform depth required along the slope sections of the reservoir walls as noted on the plans and described in the contract documents. The materials of cover sand imported shall be submitted for review and approved by the Engineer before use on-site.

Sand-in fill operations will be variable, since the extent of sub-grade deterioration is unknown.

There shall be ample sand available, within the reservoir, to collect, load-up, haul and relocate to much needed areas, prior to starting the preparation for the UCS-400 or 800 concrete mattress placement.

Sand-in fill operations will be authorized by OWNER and paid by the Cubic Yard for imported sand and by the Square Yard for relocated on-site sand.

### 1.19.02 Materials

The Contractor shall utilize all on site sand fill material where applicable. Excavated and imported sand shall be stockpiled and kept clean, free from debris and foreign materials, before being placed. Applicable soil erosion measures shall be utilized to keep material clean.

### 1.19.03 Methods of Construction

The Contractor shall utilize sand fill if and where directed. Sand that is excavated from various parts of the reservoir within the work area to fill two sections of the reservoir that have only been covered with 3/4” stone atop the geomembrane liner will be covered under the “relocated on-site sand” line item. These areas eroded and were previously covered with stone only.

Contractor is responsible to provide a 6 to 12” sand layer atop the stone areas that only have 3/4” rock on top of the geomembrane liner. The sand placement shall be completed extremely carefully to not damage the liner.

No equipment shall be permitted to drive over top of the stone areas prior to the placement of at least 6” of sand. The depth shall be verified before the operator drives onto these areas.

Contractor shall be mindful of the finished elevation of the 4 & 8” mattresses. At no time shall the 4” mattress on the slope be above the 8” mattress on the ledge.

Any damage to the liner shall be the responsibility of the Contractor and shall be repaired at no additional cost to the Owner.

1.19.04 Method of Measurement & Payment

Relocated On-Site Sand (IAWD)

The quantity of excavated sand fill for which payment will be made will be the actual area constructed as required in accordance with the plans, as specified above, or as directed by the Engineer.

Payment for excavated sand fill will be made for the quantity as above determined, measured in square yards, at the price per square yard bid for each item in the proposal, which price shall include the cost of preparing subgrade, placement of select fill in and along the roadway area including grading and scarification, pulverization, blending, shaping, compaction, etc., all materials, labor, equipment and all else necessary therefore and incidental thereto.

Imported Sand (IAWD)

The quantity of imported sand fill for which payment will be made will be the actual volume constructed as required in accordance with the plans, as specified above, or as directed by the Engineer.

Payment for excavated sand fill will be made for the quantity as above determined, measured in cubic yards, at the price per cubic yard bid for each item in the proposal, which price shall include the cost of preparing subgrade, placement of select fill in and along the roadway area including grading and scarification, pulverization, blending, shaping, compaction, etc., all materials, labor, equipment and all else necessary therefore and incidental thereto.

<u>Item #</u>	<u>Description</u>	<u>Unit</u>
17A	Relocated On-Site Sand (IAWD)	SY
17B	Imported Sand (IAWD)	CY

## 1.20 HYDROTEX UNIFORM SECTION (US) 400 & 800

### 1.20.01 Scope of Work

The Contractor shall be responsible under these items to place Slope Mattress Hydrotex US 400 and Lower Mattress Hydrotex US 800 or an approved equal. The work shall consist of furnish all labor, materials, equipment, and incidentals required and perform all operations in connection with the installation of the fabric formed concrete erosion control lining systems in accordance with the lines, grades, design, and dimensions shown on the Contract Drawings and as specified herein. If the contractor is inexperienced, then the fabric formed concrete manufacturer's representative shall provide on-site technical assistance at the beginning of the installation for a length of time the contractor is sufficiently experienced to complete the remaining installation.

The work shall consist of installing an unreinforced concrete lining by positioning specially woven, double-layer synthetic forms on the surface to be protected and filling them with a pumpable fine aggregate concrete (structural grout) in such a manner as to form a stable lining of required thickness, weight and configuration.

### **Referenced Documents**

American Society for Testing and Materials (ASTM)

- ASTM C 31 Standard Practice for Making and Curing Concrete Test Specimens in the Field
- ASTM C 33 Standard Specification for Concrete Aggregates
- ASTM C 94 Standard Specification for Ready-Mixed Concrete
- ASTM C 109 Standard Test Method for Compressive Strength Grout (Using 2-inch Cube Specimens or Grout Prisms)
- ASTM C 150 Standard Specification for Portland Cement
- ASTM C 260 Standard Specification for Air-Entraining Admixtures for Concrete
- ASTM C 494 Standard Specification for Chemical Admixtures for Concrete
- ASTM C 618 Standard Specification for Coal Fly Ash and Calcined Natural Pozzolan for Use in Concrete
- ASTM C 685 Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
- ASTM C 1019 Standard Test Method for Sampling and Testing Grout
- ASTM C 1602 Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
- ASTM C 1603 Standard Test Method for Measurement of Solids in Water
- ASTM D 2061 Standard Test Method of Strength of zippers
- ASTM D 2256 Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method
- ASTM D 4354 Practice for Sampling of Geotextiles for Testing
- ASTM D 4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- ASTM D 4533 Standard Test Method for Trapezoidal Tearing Strength of Geotextiles

ASTM D 4595 Test Method for Tensile Properties of Geotextiles by the Wide Width Strip Method  
ASTM D 4632 Test Method for Breaking Load and Elongation of Geotextiles (Grab Method)  
ASTM D 4751 Test Method for Determining Apparent Opening Size for a Geotextile  
ASTM D 4759 Practice for Determining the Specification Conformance of Geotextiles  
ASTM D 4873 Standard Guide for Identification, Storage, and Handling of Geotextiles  
ASTM D 4884 Test Method for Seam Strength of Sewn Geotextiles  
ASTM D 5199 Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes  
ASTM D 5261 Test Method for Measuring Mass per Unit Area of Geotextiles  
ASTM D 6241 Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 2-inch [50-mm] Probe  
ASTM D 6449 Standard Method for Flow of Fine Aggregate Concrete for Fabric Formed Concrete

For the purpose of these specifications, the following definitions shall apply:

#### 1.0 Compaction:

The densification of a soil by means of mechanical manipulation.

#### 2.0 Subgrade:

The ground surface usually specially prepared against which lining shall be placed. In cases where lining is to be retained the same shall be considered as subgrade.

#### 3.0 Hydrotex™ Fabric Form Mattress:

The fabric form mattress are constructed of woven, double-layer synthetic fabric. HYDROTEX linings are installed by positioning fabric forms over the areas to be protected and then pumping, high-strength, fine aggregate concrete into the forms. The fabric forms can be placed and filled either underwater or in-the-dry. The high-strength, fine aggregate concrete is used in place of conventional concrete because of its pumpability, high-strength, impermeability, and absorption resistance.

#### 4.0 Hydrotex™ Uniform Section (US) Lining:

Hydrotex Uniform Section linings provide an erosion resistant, impermeable concrete lining having a brick pattern surface and a relatively low coefficient of hydraulic friction in order to maintain optimum water velocities. The thickness and weight of the lining is controlled by spacer cords.

#### 5.0 Baffle:

Baffles are flow-directing vertical geotextile walls constructed between fabric form

sections layers. Baffles are an integral part of the fabric form design. Baffles are designed to support the panel section, determine the concrete area of the section and direct the flow of fine aggregate concrete for maximum efficiency.

#### 6.0 Slide Fastener (Zipper):

A zipper or zipper like devise having two grooved plastic edges joined by a sliding tab or pull.

### **Submittals**

The Contractor shall furnish the fine aggregate concrete manufacturer's certificates of compliance, mix design, fine aggregate gradation and fineness modulus for the fine aggregate concrete.

The Contractor shall furnish the fabric form manufacturer's certificates of compliance for the fabric forms. The Contractor shall also furnish the manufacturer's specifications, literature, shop drawings for the layout of the concrete lining panels, and any recommendations, if applicable, that are specifically related to the project.

Alternative fabric formed concrete lining materials may be considered. Such materials must be pre-approved in writing by the Engineer prior to the bid date. Alternative material packages must be submitted to the Engineer a minimum of fourteen (14) days prior to the bid date. Submittal packages must include, as a minimum, the following:

Material testing reports prepared by a certified geotextile laboratory attesting to the alternative fabric form material's compliance with this Specification. Material laboratory testing shall have been performed within ninety (90) days of the bid date.

#### 1.20.02 Materials

##### **General - Fabric Formed Concrete Lining**

Fabric formed concrete lining shall be Uniform Section (US400) type and have a finished average thickness of 4 inches, a nominal mass per unit area of 45 lb/ft<sup>2</sup>, and a comparatively uniform section with a brick pattern surface appearance. The shear resistance of the concrete lining shall be a minimum of 14 lb/ft<sup>2</sup>, as demonstrated by full scale flume testing.

Fabric formed concrete lining shall be Uniform Section (US800) type and have a finished average thickness of 8.0 inches, a nominal mass per unit area of 90 lb/ft<sup>2</sup>, and a comparatively uniform section with a brick pattern surface appearance. The shear resistance of the concrete lining shall be a minimum of 14 lb/ft<sup>2</sup>, as demonstrated by full scale flume testing.

##### **Fabric Forms Mattress**

The fabric form mattress for casting the concrete lining(s) shall be as specified, HYDROTEX<sup>®</sup> Uniform Section (US400) fabric forms mattress or approved equal.



The fabric forms shall be composed of synthetic yarns formed into a woven fabric. Yarns used in the manufacture of the fabric shall be composed of polyester. Forms shall be woven with a minimum of 50% textured yarns (by weight). Partially-oriented (POY), draw-textured, and/or staple yarns shall not be used in the manufacture of the fabric. Each layer of fabric shall conform to the physical, mechanical and hydraulic requirements Mean Average Roll Values listed in Table 1.0. The fabric forms shall be free of defects or flaws which significantly affect their physical, mechanical, or hydraulic properties.

<b>Table 1.0 PROPERTY REQUIREMENTS – HYDROTEX FABRIC <sup>1,2</sup></b>			
	<b>Test Method</b>	<b>Units</b>	<b>MARV</b>
<b>Physical Properties</b>			
Composition of Yarns	-	-	Polyester
Mass Per Unit Area (double-layer)	ASTM D 5261	oz/yd <sup>2</sup>	13
Thickness (single-layer)	ASTM D 5199	mils	15
Mill Width (Woven)		inch	84
<b>Mechanical Properties</b>			
Wide-Width Strip Tensile Strength - MD   TD	ASTM D 4595	lbs/inch	300   350
Elongation at Break - MD   TD - Max.		%	15   15
Trapezoidal Tear Strength - MD   TD	ASTM D 4533	lbs	150   175
CBR Puncture Strength	ASTM D 8241	lbs	1250
Mullen Burst Strength	ASTM D 3786 (Mod.)	psi	500
	<b>Test Method</b>	<b>Units</b>	<b>MARV Range</b>
<b>Hydraulic Properties</b>			
Apparent Opening Size (AOS)	ASTM D 4751	U.S. Standard Sieve	30 - 40
Flow Rate	ASTM D 4491	gal/min/ft <sup>2</sup>	30 - 55

Notes:

Conformance of fabric to specification property requirements shall be based on ASTM D 4759.

All numerical values represent minimum average roll values (i.e., average of test results from any sample roll in a lot shall meet or exceed the minimum values). Lots shall be sampled according to ASTM D4354.

Fabric forms shall consist of double-layer woven fabric joined together by spaced, interwoven cords of uniform length to form a concrete lining of the specified average thickness. The cords shall be interwoven between the two layers of fabric, in parallel pairs, so that the two (2) cords together in the top layer and two (2) cords together in the bottom layer cross between layers at drop points. Each cord shall have a minimum breaking strength of 160 lbf when tested in accordance with ASTM D 2256.

Mill widths of fabric shall be a minimum of 84 inches. Each selvage edge of the top and bottom layers of fabric shall be reinforced for a width of not less than 1.35 inches by adding a minimum of 6 warp yarns to each selvage construction. Mill width rolls shall be cut to

the length required, and the double-layer fabric separately joined, bottom layer to bottom layer and top layer to top layer, by means of sewing thread, to form multiple mill width panels with sewn seams on not less than 80-inch centers.

Fabric form panels shall be factory-sewn, by jointing together the layers of fabric, top layer to top layer and bottom layer to bottom layer, into predetermined custom sized panels. Sewn seams shall be downward facing as shown on the Contract Drawings. All sewn seams and zipper attachments shall be made using a double line of U.S. Federal Standard Type 401 stitch. All seams sewn shall be not less than 100 lbf/inch when tested in accordance with ASTM D 4884. Both lines of stitches shall be sewn simultaneously and be parallel to each other, spaced between 0.25 inches to 0.75 inches apart. Each row of stitching shall consist of 4 to 7 stitches per inch. Thread used for seaming shall be polyester.

Baffles shall be installed at predetermined mill width intervals to regulate the distance of lateral flow of fine aggregate concrete. The baffles shall be designed to maintain a full concrete lining thickness along the full length of the baffle. The baffle material shall be nonwoven filter fabric. The grab tensile strength of the filter fabric shall be not less than 180 lbf/inch when tested in accordance with ASTM D 4632.

The fabric forms shall be kept dry and wrapped such that they are protected from the elements during shipping and storage. If stored outdoors, they shall be elevated and protected with a waterproof cover that is opaque to ultraviolet light. The fabric forms shall be labeled as per ASTM D 4873.

The Contractor shall submit a manufacturer's certificate that the supplied fabric forms meet the criteria of these Specifications, as measured in full accordance with the test methods and standards referenced herein. The certificates shall include the following information about each fabric form delivered:

Manufacturer's name and current address;  
Full product name;  
Style and product code number;  
Form number(s);  
Composition of yarns; and Manufacturer's certification statement.

### **Fine Aggregate Concrete**

Fine aggregate concrete consists of a mixture of Portland cement, fine aggregate (sand) and water, so proportioned and mixed as to provide a pumpable fine aggregate concrete.

The water/cement ratio of the fine aggregate concrete shall be determined by the ready-mix manufacturer, but generally should be on the order of 0.65 to 0.70. The pumping of fine aggregate concrete into the fabric forms causes a reduction in the water content by filtering excess mixing water through the permeable fabric. The reduction of mixing water substantially improves the water/cement ratio of the in-place fine aggregate concrete thereby increasing its strength and durability. The sand/cement ratio should be determined by the ready-mix manufacturer and should be on the order of 2.4:1.

The consistency of the fine aggregate concrete delivered to the concrete pump should be proportioned and mixed as to have a flow time of 9-15 seconds when passed through the 19 mm orifice of the standard flow cone that is described in ASTM C6449-99. Additional Pozzolan and/or admixtures may be used with the approval of the Engineer-in-charge. The water/cement ratio varies with the exact granulometry of the fine aggregate (sand) and should be determined by the ready-mix manufacturer using the above referenced flow cone.

The Contractor should demonstrate the suitability by placing the proposed fine aggregate concrete mix into three (3) 2-inch concrete cubes or grout prisms. The mix should exhibit a minimum compressive strength of 3500 psi at 28 days, when made and tested in accordance ASTM C109/C109M-13 and ASTM C 1019.

With a typical loss of approximately 15% of the total mixing water, 27 ft<sup>3</sup> of pumpable fine aggregate concrete will reduce to approximately 25 ft<sup>3</sup> of hardened concrete. The mixing water reduction will also result in an increase of approximately 8% in the sand and cement per cubic foot of concrete. The range of fine aggregate concrete mix proportions provided in Table 2.0 has been developed under a variety of field conditions.

Table 2.0 Typical Range of Mix Proportions		
Material	Mix Proportions lb/yd <sup>3</sup>	After Placement Mix Proportions lb/yd <sup>3</sup>
Cement	750-850	805-915
Sand	2120-2030	2290-2190
Water	540-555	460-470
Air	As Required	As Required

## Components

### Portland Cement

Portland cement should conform to ASTM C 150/150M, Type I, II or V. Pozzolan grade fly ash may be substituted for up to 35% of the cement as an aid to pumpability. (The pumpability of fine aggregate concrete mixes containing course sand is improved by the addition of fly ash.) Pozzolan, if used, should conform to ASTM C 618, Class C, F or N.

### Fine Aggregate (sand)

Fine aggregate should consist of suitable clean, hard, strong and durable natural or manufactured sand. It should not contain dust, lumps, soft or flaky materials, mica or other deleterious materials in such quantities as to reduce the strength and durability of the concrete, or to attack any embedded steel, neoprene, rubber, plastic, etc. Motorized sand washing machines should be used to remove impurities from the fine aggregate. Fine aggregate having positive alkali-silica reaction should not be used. All fine aggregates should conform to ASTM C33/C33M-13. The fine aggregate should not have more than 45% passing any sieve and retained on the next consecutive sieve of those shown in Table 3.0. The fineness modulus of fine aggregate should neither be less than 2.3 nor greater than 3.1. Fine aggregate with grading near the minimum for passing the No. 50 and No. 100 sometimes have difficulties with workability or pumping. The additions of entrained air,

additional cement, or the addition of an approved mineral admixture to supply the deficient fines, are methods used to alleviate such difficulties.

ASTM C33/C33M-13 defines the requirements for grading and quality of fine aggregate for use in fine aggregate concrete and is for use by a contractor as part of the purchase document describing the material to be furnished.

Table 3.0 Grading Requirement for Fine Aggregate	
Sieve	Percent by Weight Passing the Sieve
9.5-mm (3/8-in.)	100
4.75-mm (No. 4)	95 to 100
2.36-mm (No. 8)	80 to 100
1.18-mm (No. 16)	50 to 85
600- $\mu$ m (No. 30)	25 to 60
300- $\mu$ m (No. 50)	5 to 30
150- $\mu$ m (No. 100)	0 to 10
75- $\mu$ m (No. 200)	0 to 3

Fine aggregate failing to meet these grading requirements can be utilized provided that the supplier can demonstrate to the specifier that fine aggregate concrete of the class specified, made with fine aggregate under consideration, will have relevant properties at least equal to those of fine aggregate concrete made with same ingredients, with the exception that the referenced fine aggregate will be selected from a source having an acceptable performance record in similar fine aggregate construction.

#### Water

Water used for mixing and curing should be clean and free from injurious amounts of oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete.

Potable water is permitted to be used as mixing water in fine aggregate concrete without testing for conformance with the requirements of ASTM C1602/C1602M-12.

ASTM C1602/C1602M-12 covers the compositional and performance requirements for water used as mixing water in hydraulic cement fine aggregate concrete. It defines sources of water and provides requirements and testing frequencies for qualified individual or combined water sources.

#### Plasticizing and Air Entraining Admixtures

Grout fluidifier, water reducing or set time controlling agents may be used as recommended by their manufacturers to improve the pumpability and set time of the fine aggregate concrete.

Any air entraining agent or any other admixture may be used, as approved, by the Engineer-in-charge to increase workability, to make concrete impervious and more durable. Air entraining admixture should conform to ASTM C494/C494M and ASTM C260/C260M, respectively. Mixes designed with 5% to 8% air content will improve the pumpability of

the fine aggregate concrete, freeze-thaw and sulfate resistance of the hardened concrete.

## **Ready-Mixed Concrete**

The basis of standard specifications for ready-mixed concrete should be ASTM C94/C94M-13a.

### Ordering

The contractor should require the manufacturer to assume full responsibility for the selection of the proportions for the concrete mixture, the contractor should also specify the following:

1. Requirements for compressive strength as determined on samples taken from the transportation unit at the point of discharge. Unless otherwise specified the age at test should be 28 days.
2. That the manufacturer, prior to the actual delivery of the fine aggregate concrete, furnish a statement to the contractor, giving the dry mass of cement and saturated surface-dry-mass of fine aggregate and quantities, type, and name of admixtures (if any) and the water per cubic yard or cubic metre of fine aggregate concrete that will be used in the manufacture. The manufacturer should also furnish evidence satisfactory to the contractor that the materials to be used and proportions selected will produce fine aggregate concrete of the quality specified.

### Mixing and Delivery

Ready-mixed fine aggregate concrete should be mixed and delivered to the point of discharge by means of one of the following combinations of operation:

*Central-Mixed Concrete* is mixed completely in a stationary mixer and transported to the point of delivery in a truck agitator, or a truck mixer operating at agitating speed, or in non-agitating equipment meeting the requirements of Section 13 of ASTM C94/C94M-13a.

The acceptable mixing time for mixers having capacity of 1 yd<sup>3</sup> or less is one (1) minuet. For mixers of greater capacity, this minimum should be increased 15 seconds for each cubic yard [cubic metre] of fraction thereof of additional capacity.

**Shrink-Mixed Concrete**—Concrete that is first partially mixed in a stationary mixer, and then completely in a truck mixer, should conform to the following: The time for the partial mixing should be the minimum required to intermingle the ingredients. After transfer to a truck mixer the amount of mixing at the designated mixing speed will be that necessary to meet the requirements for uniformity of concrete.

**Truck-Mixed Concrete**—Concrete that is completely mixed in a truck mixer, 70 to 100 revolutions at the mixing speed designated by the manufacturer to produce the uniformity of concrete.

No water from the truck water system should or elsewhere should be added after the initial introduction of mixing water for the batch except when on arrival to the project site the flow rate of the fine aggregate concrete is less than 9 seconds. If the flow rate is less than 9 seconds obtain the desired flow rate within 9 to 15 seconds with a one-time addition of water. A one-time addition of water is not prohibited from being several distinct additions of water provided that no fine aggregate concrete has been discharged except for flow testing. All water additions should be completed within 15 minutes from the start of the first water addition. Such addition should be injected into the mixer under such pressure and direction of flow to allow for proper distribution within the mixer. The drum should be turned an additional 30 revolutions, or more if necessary, at mixing speed to ensure that a homogenous mixture is attained. Water should not be added to the batch at any later time.

Discharge of fine aggregate concrete should be completed within 1 1/2 hours after the introduction of mixing water to the cement and fine aggregate. This limitation may be waived by the contractor if concrete is of such flow after 1 1/2 hours time has been reached that it can be placed, without the addition of water to the batch. In hot weather, or under conditions contributing to rapid stiffening of the fine aggregate concrete, a time less than 1 1/2 hours is permitted to be specified by the contractor. *Depending on the project requirements the technology is available to the manufacture to alter fresh fine aggregate properties (such as setting time or flow.) On some projects the manufacturer may request changes to certain fresh fine aggregate concrete properties due to the distance or projected transportation time between the batch plant and the point of delivery.*

Fine aggregate concrete delivered in cold weather should have the minimum temperature indicated in Table 4.0. The maximum temperature of fine aggregate concrete produced with heated aggregate, heated water, or both, should at no time during its production or transportation exceed 90 °F.

Table 4.0 Minimum Fine Aggregate Temperature as Placed	
Section Size, inch	Temperature, min, °F
< 12	55
12—36	50

#### Sampling for Uniformity

The fine aggregate concrete should be discharged at the normal operating rate for the mixer being tested, with care being exercised not to obstruct or retard the discharge by an incompletely opened gate or seal. As the mixer is being emptied, individual samples should be taken after discharge of approximately 15% and 85% of the load. *No samples should be taken before 10% or after 90% of the batch has been discharged. Due to the difficulties of determining the actual quantity of fine aggregate discharged, the intent is to provide samples that are representative of widely separated portions, but not the beginning and end of the load.*

#### Batch Ticket Information

The manufacturer of the concrete should furnish to the contractor with each batch of fine aggregate concrete before unloading at the site, a delivery ticket with the following

information:

- Name of ready-mix company and batch plant, or batch plant number.
- Serial number of ticket,
- Date,
- Truck number,
- Specific designation of job (name and location),
- Specific call or designation of the concrete in conformance with that employed in project specifications,
- Amount of fine aggregate concrete in cubic yards,
- Time loaded or of first mixing of cement and fine aggregate, and
- Amount of water added to the fine aggregate concrete by the contractor, at site, or the contractor's designated representative and their initials.

The following information, for certification purposes, required by the project specifications should be furnished:

- Type, brand, and amount of cement,
- Class, brand, and amount of coal fly ash, or raw or calcined natural pozzolans,
- Type, brand, and amount of admixtures.
- Source and amount of each metered or weighted water,
- Information necessary to calculate the total mixing water. Total mixing water includes water on fine aggregates, batch water (metered or weighted) including ice batched at the plant, wash water retained in the mixing drum, and water added by the truck operator from the mixer tank,
- Amount of fine aggregate,
- Ingredients certified as being previously approved, and
- Signature or initials of manufacturer's' representative.

### **Geotextile Filter Fabrics**

The geotextile filter fabrics shall be composed of synthetic fibers or yarns formed into a nonwoven or woven fabric. Fibers and yarns used in the manufacture of filter fabrics shall be composed of at least 85% by weight of polypropylene, polyester or polyethylene. They shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including selvages. The geotextile shall be free of defects or flaws which significantly affect its mechanical or hydraulic properties.

The geotextile filter fabric must be permitted to function properly by allowing relief of hydrostatic pressure; therefore fine soil particles shall not be allowed to clog the geotextile. The geotextile filter fabric shall be as specified elsewhere in the Contract Specifications. Final acceptance of the geotextile filter fabric by the Engineer shall be based on project specific soil information, provided by the Contractor/Owner. The geotextile filter shall meet the minimum physical requirements listed in Table 5 or greater as required by the Engineer based on site soil conditions.

The geotextile filter fabric shall be kept dry and wrapped such that they are protected from the elements during shipping and storage. If stored outdoors, they shall be elevated and protected with a waterproof cover that is opaque to ultraviolet light. The fabric forms shall be labeled as per ASTM D 4873.

<b>Table 5.0 MINIMUM PROPERTY REQUIREMENTS – FILTER FABRIC</b>			
	<b>Test Method</b>	<b>Units</b>	<b>Minimum Value</b>
<b>Mechanical Properties</b>			
Grab Tensile Strength	ASTM D 4632	lbf	180 (in any principal direction)
Elongation at Break	ASTM D 4632	%	50 max. (in any principal direction)
Trapezoidal Tear Strength	ASTM D 4533	lbf	75 (in any principal direction)
Puncture Strength	ASTM D 4833	lbs	105 (in any principal direction)
CBR Puncture Strength	ASTM D 6241	lbs	475 (in any principal direction)
<b>Hydraulic Properties</b>			
Apparent Opening Size (AOS)	ASTM D 4751	US Sieve	As Specified Elsewhere in the Contract Specifications
Permittivity	ASTM D 4491	sec <sup>-1</sup>	As Specified Elsewhere in the Contract Specifications
Flow Rate	ASTM D 4491	gal/min/ft <sup>2</sup>	As Specified Elsewhere in the Contract Specifications

Notes:

1. Conformance of fabric to specification property requirements shall be based on ASTM D 4759.
2. All numerical values represent minimum average roll values (i.e., average of test results from any sample roll in a lot shall meet or exceed the minimum values). Lots shall be sampled according to ASTM D4354.

### **Certification (Open Channel Flow)**

Fabric formed concrete lining will only be accepted when accompanied by documented full-scale hydraulic flume performance characteristics that are derived from tests under controlled flow conditions. Test guidelines shall conform to testing protocol as documented in “Hydraulic Stability of Fabric Formed Concrete Lining and Mat Systems During Overtopping Flow.”

The average thickness, mass per unit area and hydraulic resistance of each concrete lining shall withstand the hydraulic loadings for the design discharges along the structure(s). The stability analysis for each concrete lining shall be accomplished using a factor-of-safety methodology. A minimum factor of safety of 1.3 shall be required or higher as determined by lock conditions or critical structures.

### **Performance (Open Channel Flow)**

The Contractor shall provide to the Engineer calculations and design details, provided by the manufacturer or a professional engineer, attesting to the suitability of each fabric formed concrete lining for the purpose contemplated. Each concrete lining shall be accepted only when accompanied by the documented hydraulic performance characteristics derived from full-scale flume tests performed under controlled flow conditions.



### **Site Preparation - Grading**

Areas on which fabric forms are to be placed shall be constructed to the lines, grades, contours, and dimensions shown on the Contract Drawings. The areas shall be graded and uniformly compacted to a smooth plane surface with an allowable tolerance of plus or minus 0.2 feet from bottom grade, as long as ponding does not occur, and plus or minus 0.2 foot from a side slope grade as long as humps or pockets are removed.

The areas shall be free of organic material and obstructions such as roots and projecting stones and grade stakes shall be removed. Where required by the Contract Specifications, soft and otherwise unsuitable subgrade soils shall be identified, excavated and replaced with select materials in accordance with the Contract Specifications. Where areas are below the allowable grades, they shall be brought to grade by placing compacted layers of select material. The thickness of layers and the amount of compaction shall be as specified by the Engineer.

Excavation and preparation of aprons as well as anchor, terminal or toe trenches shall be done in accordance with the lines, grades, contours, and dimensions shown on the Contract Drawings.

The terminal edges of the fabric form lining should be keyed into the subgrade to the lines, grades, and dimensions shown on the Contract Drawings.

### **Inspection**

Immediately prior to placing the fabric forms, the prepared area shall be inspected by the Engineer, and no forms shall be placed thereon until the area has been approved.

### **Geotextile Filter Fabric Placement**

The geotextile filter fabric shall be placed directly on the prepared area, in intimate contact with the subgrade, and free of folds or wrinkles. The geotextile filter fabric shall be placed so that the upstream roll of fabric overlaps the downstream roll. The longitudinal and transverse joints will be overlapped at least two (2) feet. The geotextile will extend at least one (1) foot beyond the top and bottom concrete lining termination points, or as required by the Engineer.

A geotextile filter fabric, as specified elsewhere, shall be placed on the graded surface approved by the Engineer.

### **Fabric Form Placement**

Factory assembled fabric form panels shall be placed over the geotextile filter fabric and within the limits shown on the Contract Drawings. Perimeter termination of the fabric forms shall be accomplished through the use of anchor, flank and toe trenches, as shown on the Contract Drawings. When placing panels an allowance for approximately 10%

contraction of the form in each direction which will occur as a result of fine aggregate concrete filling. The contractor shall gather and fold the additional slope direction fabric form in the anchor trench to be secured in such a manner as to be gradually released as fabric forms contract during filling. The contractor shall gather the additional transverse direction fabric form at each baffle for self-release during filling.

Adjacent fabric form panels shall be joined in the field by means of sewing or zippering closures. Adjacent panels shall be joined top layers to top layer and bottom layer to bottom. All field seams shall be made using two lines of U.S. Federal Standard Type 101 stitches. All sewn seams shall be downward facing.

When conventional joining of fabric forms is impractical or where called for on the Contract Drawings, adjacent forms may be overlapped a minimum of 3 ft to form a lap joint, pending approval by the Engineer. Based on the predominant flow direction, the upstream form shall overlap the downstream form. In no case shall simple butt joints between forms be permitted. Simple butt joints between panels shall not be allowed.

Expansion joints shall be provided as shown on the Contract Drawings, or as specified by the Engineer.

Immediately prior to filling with fine aggregate concrete, the assembled fabric forms shall be inspected by the Engineer, and no fine aggregate concrete shall be pumped therein until the fabric seams have been approved. At no time shall the unfilled fabric forms be exposed to ultraviolet light (including direct sunlight) for a period exceeding five (5) days.

In the event that the Reservoir requires an emergency filling due to unforeseen circumstances, the Contractor shall submit a plan for securing the installed fabric form to date for the Engineer's approval before performing this work.

### **Hydrotex Synthetex System & Rock Interface Connection**

The beginning of the Hydrotex US400 slope mattress shall meet the existing bottom of the rock fill in the reservoir. The two interfaces shall connect by means of tucking the unfilled fabric form under the rock and between the existing cover sand layer. The ledge cover sand varies in thickness throughout the border of the reservoir. The Contractor shall hand dig a test pit every 50' to determine where the bottom of the sand layer meets the existing liner and determine the thickness of the sand layer in that area. The Contractor shall restore the test pit with the excavated cover sand.

Following the restoration of the test pit, the Contractor shall then begin to remove SMALL ROCKS ONLY by means of shovel, skid loader, or by hand. The Contractor shall not be permitted to remove large rocks and no payment shall be made. The Contractor shall also remove a portion of the cover sand layer, while maintaining a 6-inch buffer between the cover sand and existing liner. No payment shall be made for the removal of small rocks and sand, including labor and equipment used to remove. The Contractor shall include the price to remove small rocks and sand in various other pay items in the Proposal. The unfilled fabric form shall then be placed 4" to 6" under the rock with Mirafi 1160N or equal underneath it. The Contractor shall then cut and place 6" strips of C-Grid C12 1.5"x1.5"

that are Tensar Geogrid Model BX 1300 or approved equal.

The Contractor shall then furnish and install 12:1 dry mix grout to fill the voids between the rock and mattress and around the rocks. The Contractor shall then gently water down the dry mix grout to solidify the mix down between the rocks to ensure a tight seal.

No separate payment shall be made for the items discussed herein including labor, equipment, and materials. The Contractor shall include the price for said items under other pay items within the Proposal.

### **Reservoir Weepholes**

This US400 mattress does not require weep holes, however, the Contractor shall sew-in and provide one 2-inch weep hole every 1000 SF around the perimeter, between elevations 83 and 93. Submit a shop drawing showing locations, and row heights to accommodate for these weep hole locations prior to manufacturing.

There is no specific payment for furnishing and installing weep holes and the cost thereof shall be included in the unit price for the respective mattress pay item in the Proposal.

### **Fine Aggregate Concrete Placement**

Following the placement of the fabric forms over the geotextile filter fabric, fine aggregate concrete shall be pumped between the top and bottom layers of the fabric form through small slits to be cut in the top layer of the fabric form or manufacturer supplied valves. The slits shall be of the minimum length to allow proper insertion of a filling pipe inserted at the end of a 2-inch I.D. concrete pump hose. Fine aggregate concrete shall be pumped between the top and bottom layers of fabric, filling the forms to the recommended thickness and configuration. Testing of the fine aggregate concrete will be conducted by the Contractor at a frequency of one sample per 8,000 SF of fabric mattress installed. The contractor will be responsible for providing the fine aggregate material necessary to conduct the desired cylinder testing per ASTM C31. If laboratory tests on cylinders disclose a failure to develop specified strengths, the Engineer may order other tests made on affected structure. Test shall be paid for by the Contractor. If these tests indicate that affected structure cannot safely support the design load, costs of any changes, modifications or replacements required by the Engineer to remedy area in question shall be paid for by the Contractor.

Holes in the fabric forms left by the removal of the filling pipe shall be temporarily closed by inserting a piece of fabric. The fabric shall be removed when the concrete is no longer fluid and the concrete surface at the hole shall be cleaned and smoothed by hand.

Fine aggregate concrete coverage for US400 shall net  $75 \text{ ft}^2/\text{yd}^3$ .

Fine aggregate concrete coverage for US800 shall net  $37.5 \text{ ft}^2/\text{yd}^3$ .

Fine aggregate concrete shall be pumped in such a manner that excessive pressure on the fabric forms is avoided. Consultation with the fabric form manufacturer with regard to the

selection of grout/concrete pumps is recommended.

Cold joints shall be avoided. A cold joint is defined as one in which the pumping of the fine aggregate concrete into a given section of form is discontinued or interrupted for an interval of forty-five (45) or more minutes.

The sequence of fine aggregate concrete shall be such as to ensure complete filling of the fabric formed concrete lining to the thickness specified by the Engineer. The flow of the fine aggregate concrete shall first be directed into the lower edge of the fabric form and working back up the slope, followed by redirecting the flow into the anchor trench.

Prior to removing the filling pipe from the current concrete lining section and proceeding to the fine aggregate concrete filling of the adjacent lining section, the thickness of the current lining section shall be measured by inserting a length of stiff wire through the lining at several locations from the crest to the toe of the slope. The average of all thickness measurements shall be not less than the specified average thickness of the concrete lining. Should the measurements not meet the specified average thickness, pumping shall continue until the specified average thickness has been attained.

Excessive fine aggregate concrete that has inadvertently spilled on the concrete lining surface shall be removed. The use of a high-pressure water hose to remove spilled fine aggregate concrete from the surface of the freshly pumped concrete lining shall not be permitted.

Foot traffic will not be permitted on the freshly pumped concrete lining when such traffic will cause permanent indentations in the lining surface. Walk boards shall be used where necessary.

After the fine aggregate concrete has set, all anchor, flank and toe trenches shall be backfilled and compacted flush with the top of the concrete lining. The integrity of the trench backfill must be maintained so as to ensure a surface that is flush with the top surface of the concrete lining for its entire service life. Toe trenches shall be backfilled as shown on the Contract Drawings. Backfilling and compaction of trenches shall be completed in a timely fashion to protect the completed concrete lining. No more than five hundred (500) linear feet of pumped concrete lining with non-completed anchor, anchor, flank, or toe trenches will be permitted at any time.

#### 1.20.04 Method of Measurement & Payment

The fabric formed concrete erosion control mattress shall be measured by the number of square feet computed from the lines and cross sections shown on the Contract Drawings or from payment lines established in writing by the Engineer. This includes fabric form mattresses, fine aggregate concrete, testing of the fine aggregate concrete, and filter fabric used in the aprons, overlaps, anchor, terminal, or toe trenches. Slope preparation, excavation and backfilling, and bedding are separate pay items.

<u>Item #</u>	<u>Description</u>	<u>Unit</u>
19	Slope Mattress Hydrotex Uniform Section 400, Complete	SF
20	Lower Mattress Hydrotex Uniform Section 800, Complete	SF



## **1.21 - PERMANENT PAVEMENT REPAIR**

### **1. DESCRIPTION**

This section consists of furnishing, placing, and compacting permanent HMA base and surface courses needed to repair existing pavements.

### **2. MATERIALS**

All materials shall be in conformance with the New Jersey Department of Transportation (NJDOT) Standard Specifications for Road and Bridge Construction, 2019 Latest Edition. If OWNER finds that the materials are not compliant, OWNER will then call for full NJDOT Certified HMA Cores and Compliance Testing, to assure proper thickness, air voids and composition.

If penalties arise, as per the Standard Specifications of the 2019 Standard Book, then the Owner will enforce this section of the Specifications.

<u>COURSE</u>	<u>MIX NUMBERS</u>
HMA Stabilized Base	25M654
H MA Patch	25M64
Pavement Surface Course	9.5M64

### **3. METHODS OF CONSTRUCTION**

Layout the trenches and widths; mill out the HMA and materials down to gravel, then start utility work. Save the millings that meet DGA requirements, store nearby and reuse as DGA as required, to minimize hauling and deliveries. Communicate with City Public Works about potential areas to store good millings for re-use.

Pavement repairs shall not be initiated until permission to do so is granted by the Engineer. Pavement repairs shall be made by excavating the trench area to the specified depth, neatly cutting the edges of existing pavements, consolidating or compacting the proposed subgrade (top of backfill) and placing the pavement as shown on the Standard Details and as described herein. The surface course shall not be applied until final acceptance of sewers and the bituminous stabilized base course installation has been given by the Engineer.

#### **3.01 Subbase**

Sub-base material shall be Dense Graded Aggregate with a moisture content of at least six (6) plus or minus two (2) percent based on dry weight, immediately prior to placement.

Courses of not more than 8" compacted thickness shall be constructed in a single layer. Courses of more than 8" compacted thickness shall be constructed in two (2) or more layers or equal compacted thickness. No layer to be more than 8" thick.

If, in the opinion of the Owner or his representatives, the subbase construction is being adversely affected by the moisture content of the material being excessive or deficient, the construction shall not proceed until the moisture content of the material is so sufficiently reduced or increased, as determined by the Owner or his representative, to produce a satisfactory compaction.

Should the sub-base material become contaminated or for any reason be rendered unfit for its intended use after it had been sampled and approved and prior to the placement of pavement courses thereon, the Owner or his representative reserves the right to re-sample and again test the material. It shall be the responsibility of the Contractor, should any deficiencies be found, to correct them or replace the sub-base with material which meets the requirements of the Specifications, all at no additional expense to the Owner.

### **3.02 Base Course**

The base course shall consist of bituminous stabilized base constructed in thicknesses and lifts shown on the detail. Construction methods for laying conditions, placing and compacting the bituminous stabilized base shall be the same as specified below for surface course.

Place 6-inches of HMA Base, across the new trench, then wait a minimum of 3-months for settlement, then return and mill out 2-inches for the final 2-inch overlay.

Prior to opening any road to vehicular traffic, the sanitary manhole casting shall be flush to grade or feathered to grade with bituminous concrete patch. This patch material shall slope from the top of the casting to the existing pavement and provide a smooth surface for safe vehicular traffic.

In addition to manhole castings, all existing utility boxes, grates, and appurtenances within the area proposed for pavement repair shall be raised or adjusted to final grade prior to placement of pavement.

### **3.03 Surface Course**

Surface Course shall consist of a leveling course, if required by the Engineer, and the pavement surface course. The thickness after proper compaction of the pavement surface course shall be the thickness shown on the Standard Details. Prior to paving the top course, the trench area shall be broom swept clean and the bituminous stabilized base course pavement given an application of tack coat at a rate of 0.05 to 0.10 gallons per square yard. The tack coat material shall be Type RS-1 emulsified asphalt, which shall be spread by power operated equipment.

Pavement shall be machine laid, finished and rolled in accordance with the applicable provisions of NJDOT Specifications.

No materials shall be laid when the temperature falls below 40°F or the existing surface is wet or damp. The pavement shall be adequately sloped to provide proper drainage. After spreading and while still hot, the pavement course shall be compacted thoroughly and uniformly by rolling. The initial rolling shall be done with a three-wheel roller followed by a two or three-axle tandem roller. The three-wheel rollers and the three-axle tandem rollers shall have a total metal weight of not less than ten (10) tons. The two-axle tandem roller shall have a total metal weight of not less than nine (9) tons.

The Contractor shall reimburse the Owner for all costs of sampling, transportation, tests and analysis if the material is found to be subject to the maximum adjustment of pavement quantity contained in these specifications. Any price adjustments due the Owner resulting from pavement mixes non-conforming to the requirements of this specification shall be made in accordance with the provisions of the NJDOT Specifications.

### **3.04 Milling, 3” or Less**

Once all pipes, structures and major improvements done accepted, and allowed to settle for a 3-month period, the Contractor will mobilize a milling crew to properly mill all trenches and intersections, curb to curb, as drawn, where the HDD crews mobilized.

Any pilot hole areas shall also require a small mill section and resurface, to assure proper 9.5M64 surface when done.

Milling should be approximately 2-inches thick, thus allowing a final resurface depth of 2-inches compacted.

Milling will be measured by the square yard in the field.

The equipment used for milling shall be a self-propelled, planing, grinding or cutting machine possessing sufficient power, traction, and stability to maintain accurate depth of cut and slope. The machine shall be equipped with automatic grade and slope controls capable of producing a finished profile within  $\pm 0.02$  feet of a referenced elevation and a matching seam within  $\pm 0.01$  feet of an adjacent profile cut. The machine shall be capable of removing, in one pass, the specified layer of pavement to a maximum depth of 4”. Additionally, the machine shall be capable of cutting daylight, which maintains the desired profile. Machines which are equipped with heating devices to soften the pavement shall not be allowed.

All surfaces must be cleaned with a wet vac sweep and tack coated properly before pavement is placed.

OWNER WILL NOT PAY FOR HMA PLACEMENT THAT IS GREATER THAN 2 ½” LOOSE MEASURE, BEFORE COMPACTION. CONTRACTOR SHALL NOT LAY DOWN TOO MUCH HMA.

The speed of the machine shall be variable and adequate in order to produce a finished, textured surface.

Milling shall start at the low side of the cross-section and progress toward the high side. Provisions shall be made for operation, such as by lateral saw cuts into the shoulder area. In the event that all milled areas, which are opened to traffic, have not been milled to a flush surface by the end of the workday, the longitudinal edges of the milled area, exceeding 1½” high, shall be sloped and a smooth transition shall be provided at the transverse edges.

The machine shall be equipped with an integral loading and reclaiming means in order to immediately remove material being cut from the surface of the roadway so as not to present a hazard or allow the material to be re-compacted into the texture. The machine shall also be equipped with an effective means of controlling dust.



The equipment productivity shall commensurate with the scope of the work. In the case of roadway profiling/texturing, it shall be capable of producing 20 square yards per minute of operation.

The surface of the existing bituminous pavement shall be removed to a maximum depth of 2", unless approved otherwise by the Engineer, to provide the desired texture uniformly across the entire pavement surface.

The areas around inlets, manholes, water boxes, gas valves, etc. shall be cut in the new profile of the roadway, leaving only the manhole frames projecting.

Excess material resulting from the operation is to be deposited by the Contractor in trucks, by means of a conveyor belt or other suitable means and disposed of at sites outside the municipality at a location secured by the Contractor. The pavement shall be swept clear by mechanical brooming immediately after completion of the milling operation.

On Municipal roads, and when required on County and State roads, if the distance from the edge of excavation work area to the existing curb is less than two feet, the Contractor shall mill this area as well as the excavation work.

### **3. Cleaning & Tack**

All milled surfaces or trenches ready for final surface course paving MUST be thoroughly swept and cleaned with a WET BRUSH SWEEPER MACHINE.

ALL DEBRIS, SAND, DUST AND ROCKS MUST BE REMOVED BEFORE PLACING TACK COAT.

Tack coat must cover the surface, not only in narrow strips, and be placed at a min. rate of 0.10 gallons per square yard. CONTRACTOR must calibrate meter and provide meter readings each day so INSPECTOR can see that the minimum lay-down is achieved.

### **4. PAYMENT**

<u>Pay item</u>	<u>Pay Unit</u>
Milling, 3" or Less	Square Yard
Hot Mix Asphalt 25M64 Base Course, 6" th	Ton
Hot Mix Asphalt 9.5M64 Surface Course, 2" th	Ton

There is no specific payment for saw-cutting limits of final milling and finish paving, nor is there any specific payment for RS-1 Tack Coat, at 0.10 gallons per square yard; the costs thereof should be included in various other pay items in the Proposal.

## **1.22 CAST IN PLACE CONCRETE**

### **PART 1 - GENERAL**

Under this task, restore any damaged concrete curbs, sidewalks, or flatwork associated with full restoration of the reservoir, resulting from the large equipment and forces accessing the work zones for the 457 days of operations.

At the pre-construction video stage, take notes and clarify with the Owner where concrete features are likely to be damaged as a result of accessing the work zones, traversing the lands, storing materials, etc.

Record those areas and be prepared to remove these damaged features and replace them in-kind, with 4000 psi NJDOT Certified Concrete; any aprons or driving surfaces must be replaced at a minimum depth of 6-inches, with 6x6 6/6 WWF.

### **1.01 SUMMARY**

- A. Provide labor, materials, equipment and services, and perform operations required for installation of Concrete and related work as indicated on the drawings and specified herein.
- B. Related Sections: This section shall include, but not be limited to, the following:
  - 1. Concrete formwork.
  - 2. Cast in place concrete.
  - 3. Concrete reinforcement and accessories.
  - 4. Finishing concrete.
  - 5. Installation of anchors, sleeves, inserts, slots and the like prior to placement of concrete as required by other trades or for the support of their work.

### **1.02 SUBMITTALS**

- A. Product Data: Submit copies of manufacturer's latest published literature for materials specified herein for approval and obtain approval before materials are delivered to the site.
- B. Shop Drawings: Submit shop drawings for the work of this section to the Engineer for approval and obtain approval prior to fabrication of materials.
  - 1. Shop drawings shall show location of work in the project, elevations, profiles and sections. Indicate materials, sizes, shapes and thicknesses; sizes and location of reinforcement and anchors; locations of items required by work of other trades.
  - 2. Prepare clear, precise drawings, drawn to scale of 1/8 inch equals 1 foot or larger, showing location and details of reinforcement including accessories necessary to hold reinforcement in its proper position.
  - 3. Upon completion of work and before final payment is made, make legible reproductions on a minimum of 3 mil mylar of drawings and schedules. Deliver to Engineer.
  - 4. Detail reinforcement as per ACI 318.
  - 5. Engineer's review is for general compliance with structural concept. Contractor is responsible for number and length of reinforcing.
  - 6. Shop drawings submitted for structural review shall consist of (2) sets of prints and (1) set of reproduceable unless otherwise noted. Only one (1) marked up set of reproducible with the Structural Engineer's comments will be returned to the Contractor.
- C. Concrete Design Mix
  - 1. Selection of Concrete Proportions
    - a. Assume full responsibility for design of concrete mixes and maintaining strength and consistency of concrete to be used on this project.

- b. Furnish an affidavit to the Engineer attesting that the material samples submitted to the Laboratory are representative of the materials to be furnished for concrete on this project.
- c. Submit to the Engineer, with a written indication of Contractor's acceptance, three (3) copies of proposed design mix including standard deviation analysis or trial batch test data with required curves, sieve analysis of aggregate and other required tests. Submit proposed mix designs and 28 day test results to the Engineer at least 10 days before initial placement of concrete takes place.
- d. The Engineer's review of Laboratory's report and data shall not relieve Contractor from his responsibility for supplying and installing concrete in accordance with these specifications.
- e. Site and batch plant inspection during construction will be done by a Testing Laboratory retained by the Owner. Cooperate with Testing Laboratory throughout the work, including handling of test cylinders.
- f. Certification: Written conformance to above mentioned requirements and the chloride ion content of the admixture will be required from the admixture manufacturer prior to mix design review by the Engineer.

### **1.03 QUALITY ASSURANCE**

A. Materials and work shall conform to the latest edition of reference specifications listed below and specified herein, required fire ratings and to applicable codes and requirements of local authorities having jurisdiction.

1. The following specifications, codes and publications of the issues listed below, and later referred to by basic designation only, form a part of this specification to the extent indicated:

- a. American Concrete Institute Latest Edition.
  - 1) ACI 211.1 Recommended Practice for Selecting Proportions for Normal Concrete.
  - 2) ACI 301 Specifications for Structural Concrete for Buildings.
  - 3) ACI 302 Guide for Concrete Floor and Construction.
  - 4) ACI 304 Recommended Practice for Measuring, Mixing and Placing Concrete.
  - 5) ACI 305 Hot Weather Concreting.
  - 6) ACI 306 Cold Weather Concreting.
  - 7) ACI 308 Recommended Practice for Curing Concrete.
  - 8) ACI 309 Recommended Practice for Consolidation of Concrete.
  - 9) ACI 315 Details and Detailing of Concrete Reinforcement.
  - 10) ACI 318 Building Code Requirements for Reinforced Concrete.
  - 11) ACI 347 Recommended Practice for Concrete Formwork
- b. Concrete Reinforcing Steel Institute Latest Edition Recommended Practice for Placing Reinforcing Bars.
  - 1) Reinforcing Bar Splices.
- c. Specifications of the American Society for Testing and Materials (ASTM).
  - 1) A82 Specifications for Cold Drawn Steel Wire for Concrete Reinforcement.
  - 2) A185 Specifications for Welded Steel Wire Fabric for Concrete Reinforcement.
  - 3) A615 Specifications for Deformed Billet Steel Bars for Concrete Reinforcement.

- 4) C31 Standard Method of Making and Curing Concrete Test Specimens in the Field.
  - 5) C33 Specifications for Concrete Aggregates.
  - 6) C39 Standard Method of Testing for Compressive Strength of Cylindrical Concrete Specimens.
  - 7) C94 Specifications for Ready Mixed Concrete.
  - 8) C138 Unit Weight, Yield and Air Content (Gravimetric) of Concrete.
  - 9) C143 Slump of Portland Cement Concrete.
  - 10) C150 Portland Cement.
  - 11) C172 Sampling Fresh Concrete.
  - 12) C260 Air Entraining Admixtures for Concrete.
  - 13) C309 Liquid Membrane Forming Compounds for Curing Concrete.
  - 14) C330 Lightweight Aggregates for Structural Concrete.
  - 15) C404 Aggregates for Masonry Grout.
  - 16) C494 Chemical Admixtures for Concrete.
  - 17) D1752 Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.
- d. Code for Welding in Building Construction of the American Welding Society (AWS D 1.1 75).
  - e. New Jersey Building Code.
- B. Allowable Tolerances: Formwork shall comply with tolerances listed in Section 203.1 of ACI 347.
- C. Present Work
1. New work installed adjacent to and connecting with present work shall match same, except as otherwise specified. Joints between new and existing work shall be troweled smooth and even.
- D. Rejections: If laboratory tests on cylinders disclose a failure to develop specified strengths, the Engineer may order other tests made on affected structure. Test shall be paid for by the Contractor. If these tests indicate that affected structure cannot safely support the design load, costs of any changes, modifications or replacements required by the Engineer to remedy area in question shall be paid for by the Contractor.

#### **1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Materials shall be delivered to the site in original unopened containers, clearly indicating manufacturer's name, brand name, and other identifying information.
- B. Protect and store materials in accordance with ACI 301 Section 2.5.
- C. Store materials in a dry location, off the ground, and in such a manner as to prevent damage or intrusion of foreign matter. Replace damaged materials and equipment at no expense to Owner.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Portland Cement: ASTM C150 and shall be of domestic manufacture conforming to the following:
  - 1. Cement: ASTM C150, Type I – Normal Type IA – Air Entraining, Type II – Moderate, Type IIA – Air Entraining, Type III – High Early Strength, Type IIIA – Air Entraining
- B. Aggregates for Normal Weight Concrete: ACI 301, Sections 2.4.1, 2.4.3 and Section 3.6, Paragraph (a) Maximum Size Coarse Aggregate. Size of aggregates:
  - 1. Structural Concrete: 3/4 inch to No. 4.
- C. Air Entraining Admixtures: Shall conform to ASTM C260 and shall be one of the following types:
  - 1. "Air Mix" The Euclid Chemical Co.
  - 2. "MBVR" Master Builders, Inc.
  - 3. "Darex AEA" Construction Products Div., W.R. Grace & Co.
  - 4. "Sika AER" Sika Chemical Corp.
- D. Admixtures: Shall conform to ASTM C494 and contain not more than 0.05 percent chloride ions.
  - 1. Water Reducing Admixture
    - a. Eucon WR 75 by Euclid Chemical Co.
    - b. "Pozzolith 200N" by Master Builders, Inc.
    - c. "Plasto Crete 160" by Sika Chemical Corp.
    - d. "WRDA Hycol" by W.R. Grace & Co.
  - 2. Water Reducing Retarding Admixture
    - a. "Eucon Retarder 75" by Euclid Chemical Co.
    - b. "Pozzolith 100XR" by Master Builders, Inc.
    - c. "Plastiment" by Sika Chemical Corp.
    - d. "Darataro" by W.R. Grace & Co.
  - 3. High Range Water Reducing Admixture (Super Plasticizer)
    - a. "Eucon 37" by Euclid Chemical Co.
    - b. "WRDA 19" or "Daracem" by W.R. Grace & Co.
    - c. "Sikament" by Sika Chemical Corp.
    - d. "Rheo Build" by Master Builders, Inc.
  - 4. Prohibited Admixtures: Calcium chloride, thiocyanates, or any admixture containing more than 0.05 percent chloride items.
  - 5. Certification: Written conformance to the above mentioned requirements and the chloride ion content of the admixture will be required from the admixture manufacturer prior to mix design review by the Engineer.
- E. Bar Reinforcement: ASTM A615 Grade 60.
- F. Wire Mesh: ASTM A82 and A185.
- G. Epoxy Coated Bars: ASTM A775.
- H. Reinforced Paper (two ply with asphaltic adhesion) Approved Manufacturers
  - 1. "Sisalkraft SK10" by St. Regis Laminated and Coated Products Div., St. Regis Paper Company
  - 2. "Grade A" by Glas Kraft, Inc.
  - 3. "Tuff Champ" by Ludlow Corp
- I. Curing Compounds
  - 1. Curing and Sealing Compound: The compound shall be a clear styrene acrylate type, 30

percent solids content minimum, and have test data from an independent laboratory indicating a maximum moisture loss of 0.030 grams per square cm. when applied at a coverage rate of 300 square feet per gallon. Compound shall be one of the following types:

- a. "Super Rez Seal" or "Super Pliocure" by Euclid Chemical Co.
  - b. "Masterkore" by Master Builders, Inc.
2. Dissipating Resin Curing Compound: The compound shall be dissipating resin type compound conforming to ASTM C309, Type I. The film must chemically break down in a two to four week period after application.
- a. "Kurez DR" by Euclid Chemical Co.
  - b. "Sika Gard Cure Hard" by Sika Chem Corp
3. Clear Non Yellowing Curing and Sealing Compound: Compound shall be a clear non yellowing, high solids compound and have test data from an independent testing laboratory indicating a minimum of 500 hours under ultraviolet exposure without yellowing.
- a. Super Diamond Clear" by Euclid Chemical Co.
  - b. "Clear Seal" by AC Horn.
- J. Expansion Joint Filler: ASTM D1752 Type A; Asphalt impregnated fiberboard or felt; ¼ inch thick; tongue and groove profile

## **2.02 MIXES AND MIXING**

- A. Concrete shall be produced in a plant equipped with automatic batching and recording devices for ingredients and acceptable to the Engineer.
- B. The producer shall submit evidence of the uniformity of his concrete, as determined by the coefficient of variation established for his plant by a recognized agency.

## **2.03 DESIGN MIX**

- A. Design mix shall be proportioned and tested by an approved qualified Testing Laboratory as per the New Jersey Building Code.
- B. Admixtures or additives shall not be used to lower freezing point of concrete.
- C. Admixtures
  1. Concrete shall contain a water reducing admixture.
  2. Concrete slabs placed at air temperatures below 50 degrees F shall contain a non corrosive, non chloride accelerator.
  3. Use air entraining agent in normal weight (145 pcf) concrete that will be exposed to freezing and thawing cycles. Total calculated air content shall conform to table 4.2.1 of ACI 318 with volume determined by direct measurement (or by ASTM C138).
  4. Where hardener is used maximum air content shall be 3 percent.
- D. Water Cement Ratio
  1. Concrete subjected to freezing and thawing shall have a maximum water cement ratio of 0.50.
  2. Concrete subjected to de icers and/or required to be watertight shall have a maximum water cement ratio of 0.45.
  3. Reinforced concrete subject to brackish water or salt spray shall have a maximum water cement ratio of 0.40.
- E. Normal Weight Concrete.
  1. Concrete shall weigh approximately 145 pounds per cubic foot dry.
  2. Concrete shall have a minimum compressive strength as noted on the drawings at 28 days as determined by breaking cylinders in accordance with current requirements of ASTM C31 and

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine conditions at the job site where work of this section is to be performed to insure proper arrangement and fit of the work. Start of work implies acceptance of job site conditions.

### **3.02 PREPARATION**

- A. Examine the Contract Drawings and Specifications to insure the completeness of the work required under this Section. Supplementary work necessary to complete concrete, though not specifically indicated on Drawings or specified herein, shall be provided.
- B. Verify measurements and dimensions at the job site and cooperate in the coordination and scheduling of the work of this Section with the work of related trades, with particular attention given to the installation of items embedded in concrete so as not to delay job progress.

### **3.03 FORMWORK**

- A. Construction
  - 1. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until concrete members and structures are of correct size, shape, alignment, elevation and position. Structural stability and efficiency of formwork is Contractor's responsibility.
  - 2. Design formwork to be readily removable without impact, shock or damage to cast in place concrete surfaces.
  - 3. Construct forms to sizes, shapes and dimensions shown, and to obtain accurate, level and plumbness in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, rustications, reglets, chamfers, blocking, anchorages, inserts and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.
  - 4. Fabricate forms for easy removal. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets and recesses to prevent swelling and for easy removal.
  - 5. Build formwork for exposed concrete ceilings, columns and walls of 4 by 8 feet plywood sheets arranged in a uniform pattern unless otherwise indicated. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection.
  - 6. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
  - 7. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
  - 8. Where base is to be installed, chamfer on piers, pilasters and columns shall taper off at 45 degrees and stop 1/2 inch above base.
  - 9. Coat forms with approved non staining coating.
  - 10. Form Ties: Where concrete is exposed, ties shall be of snap tie type so that when forms are

removed and ties are broken no metal shall be closer than 1 inch from finished surface of concrete. Do not use lugs, cones or washers on ties which leave holes in concrete surface larger than 1 inch diameter.

11. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.
12. Cleaning and Tightening: Thoroughly clean forms and adjacent surface to receive concrete. Remove chips, wood, sawdust, dirt or other debris before concrete is placed. Retighten forms and bracing after concrete placement to eliminate mortar leaks and maintain proper alignment
13. Design and construction of formwork shall be governed by applicable sections of the New Jersey Building Code.

B. Camber:

1. The Contractor shall provide a level floor within contract specified tolerances.
2. Periodic level readings shall be supplied to the Engineer and adjustments to camber made on subsequent floors as necessary based on such readings.
3. Where camber is indicated (or for subsequent floors found required by field measurement or observations) raise bottom forms and slope gradually. Thickness of construction shall not be reduced.

### **3.04 REINFORCEMENT**

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and support.
- B. Welding of reinforcing bars shall be as specified under applicable standards of the American Welding Society (AWS).
- C. Clean reinforcement of loose rust and mill scale, earth ice, and other materials which reduce or destroy bond with concrete.
- D. Accurately position, support and secure reinforcement against displacement by formwork, construction or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.
- E. Place reinforcement to obtain minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- F. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.
- G. Where underside of concrete slabs and surfaces of beams and girders are exposed, bolsters, chairs, spacers and other accessories resting on formwork shall be of stainless steel or have plastic legs. Submit samples for approval.
- H. Reinforcement shall be approved in its assigned position, before concrete placement, by the owner's engaged inspector.

### **3.05 CONCRETE ACCESSORIES**

- A. Expansion Joint Filler: Thickness of filler shall exceed joint width by at least 25 percent and shall fill joint. Where sealing compound is required, install filler up to depth required for the compound used.



## B. Water Stops

1. Install and splice water stops in accordance with recommendations of manufacturer. Manufacturer shall have field representative available to visit site and instruct Contractor in proper methods of splicing and installing material.
2. Water stop joints shall be made continuous by butt splicing to provide an impervious connection. Joints shall be made at recommended temperature, with proper tools manufactured for working with material. At each joint, ribs and other details of the water stop shall be restored so joint is identical to approved extruded pattern.

## **3.06 CONCRETE**

### A. Placement

1. Place concrete in accordance with ACI 304, except as modified herein.
2. Place concrete continuously for each piece of work. When interruptions are necessary, leave concrete in an uneven rough condition or provide construction joint. Before starting new work, where no construction joint is provided, roughen concrete surfaces with a chipping pick, wash thoroughly and apply a bonding compound. Place new concrete after bonding compound has dried.
3. Do not deposit concrete from a height exceeding six (6) feet, or 10 feet when using concrete containing the high range water reducing admixture (superplasticizer), unless elephant trunks are used. Do not move concrete horizontally in the forms more than three (3) feet from point of deposit.
4. Place concrete for walls over 6 feet high continuously between vertical construction joints. Build forms for full height of wall and provide casting holes when elephant trunks are not used. Concrete shall not be dropped further than indicated in the preceding paragraph. Care shall be taken so that concrete does not segregate during the placing operations.
5. Limit continuous concrete placement for walls to forty (40) lineal feet. Walls longer than forty (40) lineal feet may be placed in two (2) or more sections but sections of the same day's concrete shall not be in contact with each other.
6. Repair vapor barrier damaged during placement of concrete reinforcing. Repair with vapor barrier material; lap over damaged areas minimum of 6 inches and seal watertight
7. Separate slabs on grade from vertical surfaces with ¼ inch thick joint filler.
8. Place joint filler in sidewalk patten placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
9. Extend joint filler from bottom of slab to within ¼ inch of finished slab surface.
10. Install construction joint devices in coordination with pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
11. Install joint device anchors. Maintain correct position to allow joint cover to be flush with floor and wall finish.
12. Install joint covers in one piece, longest practical length, when adjacent construction activity is complete.
13. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

### B. Pumping Concrete

1. The intent to place concrete by pumping shall be indicated in writing and the proposed design mix as well as method of pumping shall be submitted to the Engineer for approval before any pumping will be permitted. The pump must be suitable for pumping concrete at a maximum slump of 8 inches with the high range water reducing admixture (superplasticizer). The pumping of concrete shall not relieve the Contractor from following the requirements specified

under Mixing and Placement. The design mix, as previously specified, shall have a slump (at nozzle) not in excess of that herein specified for normally placed concrete. Grout, used to lubricate piping prior to pumping, shall not be placed in the project without prior approval of the Engineer. Water used to clean out pipes shall not be allowed to run into forms or come in contact with freshly placed concrete. Pumped concrete may contain the specified high range water reducing admixture (superplasticizer). The approved design mix shall not be modified without the Engineer's approval.

2. Pumping shall be done only with equipment that is in good working condition and by methods which are considered good practice. Excessive stoppages due to breakdown of equipment or plugged lines, or the need to frequently adjust mix water, will be considered just causes for the Engineer to direct that the pumping be stopped, and other methods of placement be used.
3. The use of aluminum pipes for conveying pumped concrete is prohibited.
4. Pumping shall conform to ACI 304 (Chapter 9).

C. Concrete Delivery: When concrete is delivered, provide Owner's representative with a copy of each delivery ticket showing:

1. Source of concrete (name of batch plant).
2. Cubic yards of concrete delivered.
3. Pounds of cement per cubic yard.
4. Weights of cement, sand and stone/gravel per truckload.
5. Gallons of water to be added.
6. Admixtures and amount of same.
7. Time and date of delivery, and time of first mixing, truck numbers and job inspector's name.

D. Slump

1. Slump shall conform to ACI 301 paragraph 3.5. Consistency of any mix shall be that required for specific placing conditions and methods of placement. Use and type of vibrators used to consolidate the concrete shall conform to ACI 309, "Recommended Practice for Consolidation of Concrete". Do not use additional water to compensate for slump loss due to warm weather or delays in delivery. Obtain increased slump, if necessary, with the use of the HRWR admixture (superplasticizer).
2. Where hardener is to be used, maximum slump shall be 4 inches.

E. Curing and Protection

1. Take precautions to assure proper curing and protection of concrete. Protect concrete from the sun and wind. Keep concrete continuously moist and above 50 degrees F for a period of 7 days. If high early strength concrete is used, this temperature requirement may be reduced to 3 days. Start curing as soon as possible without marring finished surfaces and do not hold over until next day. If necessary, perform overtime or night work to maintain continuity between finishing and curing operations during initial period.
2. Use the following methods to protect concrete against loss of moisture or rapid drying:
  - a. Water Curing
    - 1) Cover with burlap or quilted mats kept continuously wet or cover with approved reinforced paper as herein specified, with side and ends lapped at least 3 inches. Seal joints and edges with tape. Keep concrete wet during curing period by admitting water through "windows" provided at laps. Keep material in good condition during curing period. Do not cement material to floor.
    - 2) When, in the Engineer's opinion, favorable atmospheric conditions relating to air temperature, wind and humidity prevail, the use of water as a curing medium may

be discontinued.

b. Curing Compounds

- 1) Apply material by power spray. Maximum coverage for the curing and sealing compound shall be 400 square feet/gallon on steel troweled surfaces and 300 square feet/gallon on floated or broomed surfaces. Maximum coverage for the dissipating resin compound shall be 300 square feet/gallon on steel troweled surfaces and 300 square feet/gallon on floated or broomed surfaces. Respray surfaces subjected to heavy rainfall within 3 hours after application. Keep coated area free for foot or vehicular traffic and construction operation for a period of seven (7) days.
- 2) When, in the Engineer's opinion, unfavorable atmospheric conditions relating to air temperature, wind and humidity prevail, the use of a continuous moisture curing method may be required for the first 24 hours for the above-mentioned surfaces prior to the application.

c. Compatibility: Curing compound cannot be used on any slab that is to receive an applied floor covering (tile), paint or any applied material unless the compound is compatible with the applied material or finish. Contractor shall submit proof of compatibility prior to use of the curing compound.

d. Field Curing and Protection of Concrete Test Cylinders: Provide and maintain for the use of the Testing Laboratory adequate facilities for the safe storage and proper curing of concrete test cylinders on the site as required by ASTM C31. The cost for providing these facilities shall be part of this contract.

F. Screed Coat Membrane Waterproofing: Apply screed coat, approximately ½ inch thick unless otherwise shown or required, composed of 1:3 cement mortar, floated level, smooth and even, over slab receiving membrane waterproofing.

G. Environmental Conditions

1. Cold Weather Concreting: Approved practices for winter concreting, protecting and curing shall follow those outlined in ACI 306. Only the specified non corrosive, non chloride may be used. Calcium chloride, thiocyanates or admixtures containing more than 0.05 percent chloride ions are not permitted.
2. Hot Weather Concreting: Take preventative measures recommended in ACI 305 to control temperature of concrete prior to and after placement. When temperature and/or humidity conditions require its use, the specified water reducing, retarding admixture may be used.

### **3.07 FINISHING**

A. Base Slab- Floor or Roof

1. Scratch Finish: For top of concrete surfaces receiving cement coat waterproofing or other bonded cementitious finishes.
  - a. Strike off concrete; consolidate and level off to required elevation. The finished surface shall be level and to a FF 15/FL 13 tolerance. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes or rakes.
  - b. Before application of bonded topping, remove dirt, oil, loose aggregate and laitance from the surface with stiff wire brooms and leave coarse aggregate slightly exposed. Protect the scratched surface until topping is placed. New topping shall be placed after specified bonding compound has been applied and has dried
2. Float Finish: For horizontal surfaces receiving insulation, felt waterproof membrane or as indicated.

- a. The concrete shall be placed, consolidated, struckoff and leveled. After the concrete has stiffened sufficiently to permit the operation and the water sheen has disappeared, the surface shall be floated at least twice, to a uniform sandy texture with a power driven float. Hand floating with a wood float shall be done in areas not accessible to the machine.
  - b. The finished surface shall be within 5/16 inch above or below the specified elevation and shall achieve an FF 20/FL 17 tolerance with shores in place.
  - c. High and low spots exceeding these tolerances shall be brought to required elevations before concrete has hardened and then refloated to a smooth uniform surface. If concrete has hardened, high spots shall be ground down and low areas filled with material acceptable to the Engineer.
3. Steel Trowel Finish
- a. The concrete shall receive a floated finish as previously specified. The surface shall then be troweled, at least twice, to a smooth, hard, dense surface free of blemishes or trowel marks.
  - b. The finished surface shall be flat and level to achieve an FF 25/FL 20 tolerance. In addition, the entire floor surface must be within plus/minus 3/4 inch of the floor elevation indicated on the plans.
  - c. High and low spots exceeding these tolerances shall be brought to required elevations before concrete has hardened and then refloated to a smooth uniform surface. If concrete has hardened, high spots shall be ground down and low areas filled with the specified underlayment compound in a manner acceptable to the Engineer.

B. Wearing Surface Treatment

1. Non Slip Finish: Apply non slip aggregate not less than 30 minutes after slab has been floated to its final position, or when pressure from finger fails to make an indentation on surface. Aggregate shall be soaked in clean water for about 15 minutes, shall be sprinkled uniformly over surface and floated into concrete until aggregate is thoroughly embedded but not entirely below the surface. Apply steel trowel finish.
2. Sealer/Dustproofing (Surface Film Treatment): Wearing surface to receive surface film treatment shall be dry, clean and free from oil, grease or other foreign matter that would affect the proper application and penetration of the materials used. The penetrating dustproofing treatment, of selected color, shall be applied by manufacturer of the materials.
3. 3. Floor Dustproofing (Penetrating Treatment): Treat floors to be dustproofed with a concrete surface dustproofing compound of magnesium fluosilicate, applied in strict accordance with the manufacturer's instructions.
4. Metallic Floor Hardener
  - a. Metallic floor hardener and dustproofer shall be a premixed, ready to use material; proportioned, blended and packaged at the manufacturer's own plant and delivered to the job ready to apply at the rate of 15 pounds per 100 square feet.
  - b. Broadcast mixture over surface of freshly floated concrete in two separate shakes. Finish with a steel trowel to produce a smooth level surface. Application shall be made in strict accordance with manufacturer's recommendations and directions.
  - c. The manufacturer of the hardener shall provide at no cost the services of a trained technician during the initial periods of installation. Give a minimum of three (3) days notice to the hardener manufacturer prior to initial use of the product.
5. Non-Metallic Floor Hardener
  - a. Non metallic floor hardener and dustproofer shall be a premixed, ready to use material; proportioned, blended and packaged at the manufacturer's own plant and delivered to the job ready to apply at the rate of 12 pounds per 100 square feet.

- b. Broadcast mixture over surface of freshly floated concrete in two separate shakes. Finish with a steel trowel to produce a smooth level surface. Application shall be made in strict accordance with manufacturer's recommendations and directions.
- c. The color shall be as indicated on Finish Schedule
- d. The manufacturer of the hardener shall provide at no cost the services of a trained technician during the initial periods of installation. Give a minimum of three (3) days notice to the hardener manufacturer prior to initial use of the product.

### C. Exposed Concrete Finishes

#### 1. Type B Concrete Finish

- a. On surfaces which are to be permanently exposed to view, whether painted or unpainted: remove fins or other projections on surfaces, fill voids and honeycombed areas and repair any damaged areas as herein specified. Exposed surfaces are to be left smooth and in plane, free of stains or dirt, and of a uniform color and texture throughout. Grind down offsets due to form joints with carborundum stone and water to leave a smooth surface. Finish top horizontal surfaces with a wood float, unless otherwise indicated, and round edges slightly by tooling with an edger of small radius (1/8 inch max.) or rubbing with carborundum stone and water. On exterior surfaces, carry finish down 4 inches below finished grade.
- b. Joints to be left exposed shall be straight and lie in a true vertical or horizontal line.

#### 2. Type C Concrete Finish: Remove projecting fins, rough edges and closely clip off nails or wires projecting from surface of concrete. Cut form ties back 1 inch and patch holes or voids with 1:3 mortar. Repair honeycombed or defective areas in accordance with Sections 9.1 through 9.4 of ACI 301.

#### 3. Type D Concrete Finish

- a. Finished surface of ceiling slabs, beams, girders, walls and columns shall present a smooth and even surface, within tolerances specified, to receive a skim coat of plaster applied directly to concrete over a bonding agent. Application of bonding agent and plaster will be done under another division of specifications.
- b. Upon removal of forms, remove joint marks and fins and by wire brushing remove all loose surface material. Cut form ties back 1 inch and patch any holes or voids with 1:3 mortar. Repair honeycombed or defective areas as herein specified. Remove any excess form oil left on concrete.
- c. For this type of finish, the sample panels shall include an entire bay, consisting of ceiling, one column and a wall, as required.

### **3.08 GROUTING**

- A. Grout, except under steel bearing or base plates, shall be composed of one (1) part cement to one (1) part loose sand by volume and shall have a 2-inch maximum slump. Mix together dry until mixture has even color and then add water while mixing until grout is of required consistency.

### **3.09 EXPOXY JOINT FILLER**

- A. Contraction or construction joints, in areas receiving metallic or mineral aggregate hardener, shall be filled with specified epoxy joint filler. The epoxy joint filler shall be mixed and installed in strict accordance with manufacturer's instructions. The joint shall not be filled sooner than 90 days after slab placement.

### **3.10 PATCHING**

- A. Allow Engineer to inspect concrete surfaces immediately upon removal of form
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon

discovery.

C. Patch imperfections as directed by Engineer

### **3.11 DEFECTIVE CONCRETE**

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements.
- B. Repair or replacement of defective concrete will be determined by Engineer
- C. Do not patch, fill, touch up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

### **MEANS AND METHODS OF MEASUREMENT AND PAYMENT**

Any repairs, removals and replacements of concrete curbs, walks, ramps or aprons, resulting from staging, storage, access, etc, will NOT be measured for payment, and the costs associated with the repairs to broken curbs, walks, aprons, etc, should be included in the lump sum bid for 'Restoration, Complete' in the Proposal.

HMA loop road repairs, however, will be measured and paid for separately, if the HMA loop road does fail during operations.

**-- END OF DIVISION 2 SITE WORK --**



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REV	DATE	DESCRIPTION	DRAWN BY	DATE	DESCRIPTION
1	12/14/2024		JDD		

**Jordan R. Volk**  
 NEW JERSEY LICENSED PROFESSIONAL ENGINEER  
 LICENSE NUMBER: GE47012  
 COLLIER'S ENGINEERING & DESIGN, INC.  
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RESERVOIR  
 INFRASTRUCTURE  
 MAINTENANCE  
 IMPROVEMENTS PROJECT  
 UCS UNIFORM CONCRETE  
 LINING  
 FOR  
 BRICK TOWNSHIP  
 MUNICIPAL  
 UTILITIES  
 AUTHORITY  
 TOWNSHIP OF BRICK  
 OCEAN COUNTY  
 TOWNSHIP OF WALL  
 MONMOUTH COUNTY  
 NEW JERSEY

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SCALE: AS SHOWN DATE: 09/04/24 DRAWN BY: JDD CHECKED BY: JRV  
 PROJECT NUMBER: BKU066 DRAWING NAME: C-COVER

SHEET TITLE: QUANTITIES

SHEET NUMBER: 3 of 18

PAY ITEM NO.	DESCRIPTION	UNIT	CONTRACT QUANTITY	PLAN SHEET TOTALS	IF AND WHERE DIRECTED	AS - BUILT QUANTITY	PLAN SHEET QUANTITY				
							SHEET C-1	SHEET C-2	SHEET C-3	SHEET C-4	SHEET C-5
1	Mobilization	LS	1	0	1		0	0	0	0	0
2	No Item										
3	Construction Layout	LS	1	0	1		0	0	0	0	0
4	No Item										
5	Inlet Protection	UN	6	6	0		3	0	3	0	0
6	Silt Fence	LF	7100	7100	0		900	0	2800	1700	1700
7	Turbidity Protection Screen, Complete	LF	7600	7600	0		1100	1650	2000	1400	1450
8	No Item										
9	No Item										
10	Clearing Site	LS	1	0	1		0	0	0	0	0
11	Excavation, Test Pit (IAWD)	CY	10	0	10		0	0	0	0	0
12	No Item										
13	Excavation, Unclassified (IAWD)	CY	100	0	100		0	0	0	0	0
14	No Item										
15	Fine Grading	SY	64200	64200	0		9750	13575	16450	12575	11850
16	3/4" Clean Stone (IAWD)	TN	1000	0	1000		0	0	0	0	0
17A	Relocated On-Site Sand (IAWD)	SY	11,500	0	11,500		-	-	-	-	-
17B	Imported Sand (IAWD)	CY	5,250	0	5,250		-	-	-	-	-
18	No Item										
19	Slope Mattress Hydrotex Uniform Section 400, Complete	SF	530000	506000	24000		76000	104000	126000	100000	100000
20	Lower Mattress Hydrotex Uniform Section 800, Complete	SF	80000	78000	2000		11000	17000	20000	15000	15000
21	Concrete Cylinder Testing (Testing of Non-Mattress Injected Concrete)	LOT	8	0	8		0	0	0	0	0
22	Restoration, Complete	LS	1	0	1		0	0	0	0	0
23	Final Cleanup	LS	1	0	1		-	-	-	-	-
	<b>Add-Alternate "A"</b>										
A-1	Fuel Price Adjustment	AL	1	0	1		-	-	-	-	-
A-2	Asphalt Price Adjustment	AL	1	0	1		-	-	-	-	-
A-3	HMA Milling, 3" or less	SY	11100	11100	0		1700	2200	2780	2220	2200
A-4	Hot Mix Asphalt 25M64, Base Course (IAWD)	TN	300	0	300		-	-	-	-	-
A-5	Hot Mix Asphalt 9.5M64 Surface Course	TN	1400	1400	0		220	275	350	280	275
A-6	DGA Base Course, 6" Th. (IAWD)	SY	11100	0	11100		-	-	-	-	-

ISSUED FOR BIDDING

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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