PHILIP D. MURPHY
Governor

TAHESHA L. WAY
Lt. Governor

State of New Jersey
DEPARTMENT OF TREASURY
DIVISION OF PROPERTY MANAGEMENT & CONSTRUCTION
P O BOX 034
TRENTON NJ 08625-0034

ELIZABETH MAHER MUOIO
State Treasurer

CHRISTOPHER CHIANESE
Director

May 9, 2024

Kappa Construction Corp.
One Freehold Road
Ocean, NJ 07712

Re: **Notice to Proceed**
Project #P1222-00
New Visitor Center – Washington Crossing State Park
Titusville (Hopewell Township), NJ – Mercer County
Award Amount: **$18,885,000.**

To Whom It May Concern:

We have received and accepted your certificates of insurance and performance and payment bonds. Attached is a fully executed contract for your records.

Contract performance shall be completed within **540** calendar days of the date of this Notice to Proceed.

You have been authorized to proceed on **May 13, 2024** with **Non-Permit Activities.**

Sincerely,

Christopher R. Geary, Assistant Deputy Director
Contracts and Procurement

C E. Cardone
G. Cardone
J. Langsdorf
B. Mahan
S. Baker
M. Ryan
Central File
Treasury Fiscal

Receipt and Understanding is Hereby Acknowledged.

Gus Kamaratos
Signature

5/9/24
Date

CONTRACT

THIS AGREEMENT, made this 9th day of May, **2024**

by and between The State of New Jersey, herein called "Owner," acting herein through its
(Corporate Name of Owner)

Division of Property Management and Construction, Deputy Director, , and
(Title of Authorized Official)

KAPPA CONSTRUCTION CORP.

(a corporation)

of **One Freehold Road,** City of **Ocean,** County of **Monmouth,** and State of **New Jersey** hereinafter called "Contractor". (FID#22353835200)

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the **OWNER**, the **CONTRACTOR** hereby agrees with the **OWNER** to commence and complete the construction described as follows:

CONTRACT PROJECT NO.: **P1222-00-CC01**
NEW VISITOR CENTER
WASHINGTON CROSSING STATE PARK
MERCER COUNTY – TITUSVILLE (HOPEWELL TOWNSHIP)
NEW JERSEY

LUMP SUM BID ..... $18,885,000.

SPECIFICATIONS:	Dated 10-30-23 included as part of this contract
ALLOWANCES:	Submitted on Pages 3 of 5 of the Bid Proposal Form, included as part of this contract
BULLETINS:	"A" dated 01-08-24, "B" dated 01-08-24, "C" dated 02-23-24, "D" dated 03-14-24, "E" dated 03-20-24 and "F" dated 04-02-24 have been acknowledged by the bidder and included as part of this contract
GEN.CONDITIONS:	Instructions to Bidders & General Conditions revised December 2015, included as part of this contract
DRAWINGS:	See cover sheet dated 10-30-23, included as part of this contract
POST BID REVIEW CERTIFICATION:	Dated 04-16-24, included as part of this contract

hereinafter called the project, for the sum of **EIGHTEEN MILLION EIGHT HUNDRED EIGHTY-FIVE THOUSAND** Dollars (**$18,885,000.**) and all extra work in connection therewith, under the terms as stated in the General and Special Conditions, if applicable, of the Contract Specifications, and at his (its or their) own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendent, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, Special Conditions of the Contract Specifications, the plans, which include all maps, plats, blue prints, and other drawings and printed or written explanatory matter thereof, the specifications and contract documents therefore as prepared by **IKON.5 Architects,** herein entitled the Architect/Engineer, all of which are made a part hereof and collectively evidence and constitute the contract.

The contractor hereby agrees to commence work under this contract on **(See Notice to Proceed)** and to fully complete the project within **540** consecutive calendar days thereafter. Time is of the essence for the completion of this contract. The contractor further agrees to pay, as liquidated damages, the sum of **$9,443.00** for each consecutive calendar day thereafter as hereinafter provided in Article 7.5 of the General Conditions.

The **OWNER** agrees to pay the **CONTRACTOR** in current funds for the performance of the contract, subject to additions and deductions, as provided in the General Conditions of the Contract Specification, and to make payments on account thereof as provided in Article 10 of the General Conditions.

Only domestic materials shall be acquired or used for any public work unless the head of the department, or other public officer charged with the duty by law, shall determine it to be inconsistent with the public interest, or the cost to be unreasonable, or domestic materials of the class or kind to be used are not mined, produced or manufactured, as the case may be, in the United States in commercial quantities and of a satisfactory quality.

The Contractor shall conform to all provisions of "Law Against Discrimination" N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27.

IN WITNESS WHEREOF, the parties to these presents have executed this contract in four (4) counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

ATTEST:

(Witness)

By

DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION

CHRISTOPHER R. GEARY
ASSISTANT DEPUTY DIRECTOR
(Title)

(Witness)

By

KAPPA CONSTRUCTION CORP.
(Contractor)

PRESIDENT
(Title)

ONE FREEHOLD ROAD
OCEAN, NJ 07712
(Address)

WARRANTY:

It is hereby certified and warranted by the undersigned contractor and by the undersigned principals or officers thereof, for said Contractor and for themselves, personally and individually, that no person has been employed to solicit or secure this Contract in violation of the provisions of Section 10, Chapter 48 of the Laws of 1954, N.J.S.A. 52:34-15, or in violation of any other laws of the State of New Jersey; and it is further warranted that all applicable laws and regulations shall be complied within the performance of this contract.

Please be advised that pursuant to N.J.S.A. 54:49-19 et seq. and notwithstanding any provision of the law to the contrary, whenever any taxpayer, partnership or S corporation under contract to provide goods or services or construction projects to the State of New Jersey or its agencies or instrumentalities, including the legislative and judicial branches of State government, is entitled to payment for those goods or services at the same time the taxpayer, partner or shareholder of that entity is indebted for any State tax, the Director of the Division of Taxation shall seek to set off so much of that payment as shall be necessary to satisfy the indebtedness. The amount set-off shall not allow for the deduction of any expense or other deductions which might be attributable to the taxpayer, partner, or shareholder subject to set-off under this Act.

The Director of the Division of Taxation shall give notice of the set-off to the taxpayer, partner or shareholder and provide an opportunity for a hearing within 30 days of such notice under the procedures for protests established under N.J.S.A. 54:49-18. No request for conference, protest, or subsequent appeal to the Tax Court from any protest shall stay the collection of the indebtedness. Interest that may be payable by the State, pursuant to N.J.S.A. 52:32-32 *et. seq.* to the taxpayer shall be stayed.

By signing this contract, I certify, pursuant to N.J.S.A. 52:34-12.2, that the entity for which I am authorized to bid:

has no ongoing business activities in Northern Ireland and does not maintain a physical presence therein through the operation of offices, plants, factories, or similar facilities, either directly or indirectly, through intermediaries, subsidiaries or affiliated companies over which it maintains effective control; or

will take lawful steps in good faith to conduct any business operations it has in Northern Ireland in accordance with the McBride principles of nondiscrimination in employment as set forth in N.J.S.A. 52:18A-89.5 and in conformance with the United Kingdom's Fair Employment (Northern Ireland) Act of 1989, and permit independent monitoring of their compliance with those principles.

I certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are willfully false, I am subject to punishment.

KAPPA CONSTRUCTION CORP.
(Contractor)

(Witness)

By

PRESIDENT
(Title)

ONE FREEHOLD ROAD
OCEAN, NJ 07712
(Address)

This contract conforms to the standard form approved by the Attorney General.

MATTHEW J. PLATKIN
ATTORNEY GENERAL OF NEW JERSEY

* Current Wage Rates dated **May 9, 2024** and are included as part of this contract.

PURSUANT TO N.J.S.A. 10:5-31 ET. SEQ. AND N.J.A.C. 17:27-7.2, "THE MINORITY PERCENTAGE GOAL REQUIREMENT FOR THIS CONTRACT IS **30%** PER SKILLED CRAFT."

PURSUANT TO N.J.S.A. 10:5-31 ET. SEQ. AND N.J.A.C. 17:27-7.2, "THE FEMALE PERCENTAGE GOAL REQUIREMENT FOR THIS CONTRACT IS **6.9%** PER SKILLED CRAFT."

"(The Contractor) shall maintain all documentation related to products, transactions or services under this contract for a period of five years from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller upon request."

****Revised per Bulletin E****

BID PROPOSAL FORM

STATE OF NEW JERSEY
DEPARTMENT OF TREASURY
DIVISION OF PROPERTY MANAGEMENT & CONSTRUCTION
P O BOX 034
TRENTON NEW JERSEY 08625-0034

The bid proposal is to be returned in the pre-addressed envelope and will be accepted no later than 2:00 p.m., **April 9, 2024** after which time the bid proposals will be publicly opened and read.

FIRM NAME:
(Please Type or Print)
(Business Street Address ONLY – No P O Box)

Kappa Construction Corp.
One Freehold Road
Ocean, NJ 07712

PROJECT NO P1222-00
PROJECT: New Visitor Center – Washington Crossing State Park
LOCATION: 355 Washington Crossing – Pennington Road, Titusville, Hopewell Twp
COUNTY: Mercer

The undersigned Single Prime Contractor proposes to be responsible for all work shown in the contract plans and specifications.

☒ Single Bid lump sum all trades $ 18,885,000.00
(Numerical Figures Only)

In accordance with N.J.S.A. 52:35-1 et seq., the Contractor will be classified with the Division of Property Management and Construction (DPMC) in one of the following trades: **Construction Manager as Constructor (C006) or General Construction (C008)**

The proposal is based upon the bid documents listed below.

1. Instructions to Bidders and General Conditions Revised December, 2015
2. Specifications dated October 30, 2023
3. Drawing(s)#: See Cover Sheet dated October 30, 2023

This project will be fully completed and ready for occupancy within 540 calendar days.

Liquidated damages will be assessed at 1/20 of one percent (.05%) of the value of this contract (minimum of $250.00/day).

The above price is good through sixty (60) days after the bid opening date.

Submit only one bid proposal and bid bond form.

A bid bond in the amount of fifty percent (50%) of the TOTAL bid, including alternates if applicable, must accompany this proposal form.

PROJECT NO.: P1222-00

The Contractor must include prices for the base bid and all alternates and unit prices when requested, otherwise the bid may be considered non-responsive.

Having examined the bid documents and the site of the proposed work and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, the Contractor hereby proposes to furnish all labor, materials and supplies, and to construct the project as submitted, within the time set forth therein, and at the price stated. This price is to cover all expenses incurred in performing the work required, of which this proposal is a part.

The Contractor acknowledges and affirms that it has personal knowledge of or has obtained and reviewed a copy of the valid prevailing wage rates for all trades involved in the project for the geographical location of the project as issued by the Commissioner of the Department of Labor, P O Box 389,Trenton, New Jersey, 08625 (609) 292-2259.

The Contractor acknowledges receipt of the following Bulletins:

BULLETIN NUMBER	**DATE OF BULLETIN**
Bulletin A	January 8, 2024
Bulletin B	January 8, 2024
Bulletin C	February 23, 2024
Bulletin D	March 14, 2024
Bulletin E	March 20, 2024
Bulletin F	April 2, 2024

The names and addresses of each Subcontractor included in this Single Bid proposal are listed below and are classified with DPMC in accordance with N.J.S.A. 52:35-1 et seq. at the time of the bid due date. If the Single Prime contractor intends to perform the work described under any of the listed trades sections of this bid proposal form, that Single Prime Contractor must be classified in that trade and listed in the appropriate Subcontractor section of this bid proposal. The Contractor acknowledges the failure to list classified Subcontractors as part of Single Bid proposals shall constitute a non-waivable material deviation resulting in a rejection of the bid.

STRUCTURAL STEEL & ORNAMENTAL IRON (C029)

NAME: SPARTA STEEL CORP.

ADDRESS: 35 WOODPORT RD. SPARTA, NJ 07871

PLUMBING (C030)

NAME: AGP & SONS, INC.

ADDRESS: 918 CHARLES DR, TOMS RIVER NJ 08753

PROJECT NO.: P1222-00

HVACR (C032)

NAME: McCLOSKEY MECHANICAL CONTRACTORS, In

ADDRESS: 445 LOWER LANDING RD., BLACKWOOD, NJ 08012

ELECTRICAL (C047)

NAME: QPI ELECTRICAL CO., INC.

ADDRESS: 1805 WOODBOURNE RD., LEVITTOWN, PA 19057

ALLOWANCES

The following allowances have been included in this proposal.

	Description (Specification section) See Specification Section 01 21 00	TRADE(S)	Amount
1.	Electrical Utility Company Connection Fees for electrical service connection. Specification Section 01 21 00.	C006 or C008	$ 25,000.00

EXECUTION OF CONTRACT

Upon receipt of written notice of the acceptance of this bid, the Contractor shall execute the formal contract within 10 calendar days and deliver a Performance and Payment Bond as well as other information as required in the bid solicitation.

COMMENCEMENT OF WORK

Contractor acknowledges that the work is to commence upon receipt of the Notice to Proceed with the exception of permit activities.

BID SECURITY

Bid Bond is fifty percent (50%) of the TOTAL bid, including alternates if applicable, and is to become the property of the State in the event the contract and bond are not executed within the time set forth as described in Section 6.4 of the Instructions to Bidders.

PROJECT NO.: P1222-00

CERTIFICATION

I certify that the below named firm is classified by the Division of Property Management and Construction in the approved amount of $ 65,000,000 for (trade) C008, C032, & C046 until 10/17/25 (expiration date).

I further certify that this firm's bid for this project does not cause the firm to exceed its aggregate rating limit, including consideration of uncompleted construction work (please refer to N.J.A.C. 17:19-2.13, which describes how certain major trade subcontract work is discounted 85% for purposes of calculating whether a contractor is within its rating).

Respectfully submitted,

(Seal-if Bid proposal is by a corporation)

By: Kappa Construction Corp.
(Name of Firm)

(Signature)

Gus Kamaratos
President
(Title)

One Freehold Road
Ocean, NJ 07712
(Business Street Address ONLY – No P O Box)

(City State County Zip)

Phone No. 732-380-7045 - Phone
732-380-7042 - Fax

Fax No.

Federal Identification No. [redacted]

Any change in ownership information since filing your Request for Classification (Form DPMC 27)

☐ Yes

☒ No

If yes, attach explanation.

PROJECT NO.: P1222-00

STATE OF NEW JERSEY
DEPARTMENT OF TREASURY
DIVISION OF PROPERTY MANAGEMENT & CONSTRUCTION

NON-COLLUSION AFFIDAVIT

PROJECT: P1222-00
New Visitor Center – Washington Crossing State Park
Mercer County

Bid Due Date **April 9, 2024** 02:00 PM

STATE OF NEW JERSEY [
[SS.
COUNTY OF MONMOUTH

I, Gus Kamaratos President of the City of OCEAN TWP.

in the County of MONMOUTH and the State of NEW JERSEY

of full age, being duly sworn according to law on my oath depose and say that:

I am Gus Kamaratos President

of the firm of Kappa Construction Corp.

the Contractor making the Bid Proposal for the above named project, and that I execute the said Bid Proposal with full authority so to do; that said Contractor 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 proposal and in this affidavit are true and correct, and made with full knowledge that the State of New Jersey relies upon the truth of the statements contained in said Bid Proposal and in the statements contained in this affidavit in awarding the contract for the said project.

SIGNATURE OF PRINCIPAL

Gus Kamaratos
President

Subscribed and sworn to before me this 9th day
of April 2024.

Ellen Kamaratos
Notary Public

My Commission expires 02/05/2028

ELLEN KAMARATOS
Notary Public, State of New Jersey
My Commission Expires 02/05/2028

ELLEN KAMARATOS
Notary Public, State of New Jersey
My Commission Expires 02/05/2028

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. 17:27-7.2

CONSTRUCTION CONTRACTS

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

a. 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, up-grading, 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.

b. 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.

c. The contractor or subcontractor will send to each labor union, with which he 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.

d. 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.

e. 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, 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 applicable 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:

(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 subcontractor 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 subcontractor 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.

(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 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 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 of 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 layoff 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 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 subcontractors 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 women is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing with the reasons for the determination and 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, and on forms made available by 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 minority and women advanced trainees and trainees in numbers which result in the employment of advanced 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 website, 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 Division 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.

ANTIDISCRIMATION PROVISIONS

Mandatory Language

N.J.S.A. 10:2-1

The contractor agrees that:

Antidiscrimination provisions. Every contract for or on behalf of the State or any country or municipality or other political subdivision of the State, or any agency of or authority created by any of the foregoing, for the construction, alteration or repair of any public building or public work or for the acquisition of materials, equipment, supplies or services shall contain provisions by which the contractor agrees that:

a. 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, no 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;

b. No contractor, subcontractor, nor any person on his 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 such materials, equipment, supplies or services to be acquired under such contract, on account of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex;

c. There may be deducted from the amount payable to the contractor by the contracting public agency, 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

d. This contract may be canceled or terminated by the contracting public agency, and all money due or to become due hereunder may be forfeited, for any violation of this section of the contract occurring after notice to the contractor from the contracting public agency of any prior violation of this section of the contract.

ADDITIONAL MANDATORY CONSTRUCTION CONTRACT LANGUAGE

It is the policy of the State of NJ Department of the Treasury, Division of Property Management & Construction (DPMC), that its contracts should create a workforce that reflects the diversity of the State of New Jersey. Therefore, contractors engaged by the DPMC, to perform under a construction contract shall put forth a good faith effort to engage in recruitment and employment practices that further the goal of fostering equal opportunities to minorities and women.

The contractor must demonstrate to the DPMC's satisfaction that a good faith effort was made to ensure that minorities and women have been afforded equal opportunity to gain employment under the DPMC's contract with the contractor. Payment may be withheld from a contractor's contract for failure to comply with these provisions.

Evidence of a "good faith effort" includes, but is not limited to:

1. The Contractor shall recruit prospective employees through the State Job bank website, managed by the Department of Labor and Workforce Development, available online at http://NJ.gov/JobCentralNJ;

2. The Contractor shall keep specific records of its efforts, including records of all individuals interviewed and hired, including the specific numbers of minorities and women;

3. The Contractor shall actively solicit and shall provide the DPMC with proof of solicitations for employment, including but not limited to advertisements in general circulation media, professional service publications and electronic media; and

4. The Contractor shall provide evidence of efforts described at 2 above to the DPMC no less frequently than once every 12 months.

5. The Contractor shall comply with the requirements set forth at N.J.A.C. 17:27.

AMERICANS WITH DISABILITIES ACTS
State Contract Language

Equal Opportunity for Individuals with Disabilities

The **CONTRACTORS** and the **STATE** do hereby agree that the provision of Title II of the Americans With Disabilities Act of 1990 (the "Act") (**42 U.S.C. S12101 et. seq.**), which prohibits discrimination on the basis of disability by public entities in all services, programs and activities provided or made available by public entities, and the rules and regulations promulgated pursuant thereunto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the **STATE** pursuant to this contract, the **CONTRACTOR** agrees that the performance shall be in strict compliance with the Act. In the event that the **CONTRACTOR**, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act during the performance of this contract, the **CONTRACTOR** shall defend the **STATE** in any action or administrative proceeding commenced pursuant to this Act. The **CONTRACTOR** shall indemnify, protect, and save harmless the **STATE**, its agents, servants, and employees from and against any and all suits, claims, losses, demands, or damages of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The **CONTRACTOR** shall, at its own expense, appear, defend, and pay any and all charges for legal services and any and all costs and other expenses arising from such action or administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the **STATE**'s grievance procedure, the **CONTRACTOR** agrees to abide by any decision of the **STATE** which is rendered pursuant to said grievance procedure. If any action or administrative proceeding results in an award of damages against the **STATE** or if the **STATE** incurs any expense to cure a violation of the **ADA** which has been brought pursuant to its grievance procedure, the **CONTRACTOR** shall satisfy and discharge the same at its own expense.

The **STATE** shall, as soon as practicable after a claim has been made against it, give written notice thereof to the **CONTRACTOR** along with full and complete particulars of the claim. If any action or administrative proceeding is brought against the **STATE** or any of its agents, servants, and employees, the **STATE** shall expeditiously forward or have forwarded to the **CONTRACTOR** every demand, complaint, notice, summons, pleading, or other process received by the **STATE** of its representatives.

It is expressly agreed and understood that any approval by the **STATE** of the services provided by the **CONTRACTOR** pursuant to this contract will not relieve the **CONTRACTOR** of the obligation to comply with the Act and to defend, indemnify, protect, and save harmless the **STATE** pursuant to this paragraph.

It is further agreed and understood that the **STATE** assumes no obligation to indemnify or save harmless the **CONTRACTOR**, its agents, servants, employees and subcontractors for any claim which may arise out of their performance of this Agreement. Furthermore, the **CONTRACTOR** expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the **CONTRACTOR**'s obligations assumed in this Agreement, nor shall they be construed to relieve the **CONTRACTOR** from any liability, nor preclude the **STATE** from taking any other actions available to it under any other provisions of the Agreement or otherwise at law.

ADVERTISEMENT FOR BIDS

Project No: **P1222-00 – New Visitor Center**
Location: **Washington Crossing State Park – 355 Washington Crossing – Pennington Road – Titusville (Hopewell Township), Mercer County, NJ**

A MANDATORY PRE-BID MEETING IS SCHEDULED FOR 10:00 A.M. FEBRUARY 21, 2024. LOCATION: VISITOR CENTER – WASHINGTON CROSSING STATE PARK – 355 WASHINGTON CROSSING-PENNINGTON ROAD – TITUSVILLE (HOPEWELL TOWNSHIP), MERCER COUNTY, NJ CONTACT PERSON: GENE CARDONE VIA OFFICE (609) 633-2648 OR VIA CELL (609) 306-2574. ONLY BIDS SUBMITTED BY CONTRACTORS WHO ATTEND THIS MEETING WILL BE ACCEPTED.

Sealed proposals must be received and time-stamped in the Plan Room, Division of Property Management & Construction, 33 West State Street, 9th Floor, (PO Box 034) Trenton, NJ 08625 until 2:00 p.m. on March 26, 2024 for:

Single Bid (lump sum all trades)
Construction Manager as Constructor (C006) or
General Construction (C008)
$14,002,541

IN ACCORDANCE WITH N.J.S.A. 52:32-2, THIS PROJECT SHALL BE BID AS A SINGLE BID (LUMP SUM ALL TRADES). BIDDER MUST BE CLASSIFIED THEMSELVES OR NAME THEIR CLASSIFIED SUBCONTRACTOR(S) FOR THE FOLLOWING TRADE(S):

Plumbing (C030)
HVACR (C032)
Electrical (C047)

Failure To List Classified Sub-Contractors Will Make The Bid Non-Responsive.

A list of Classified Contractors / Sub-Contractors are available at the following Web site:
http://www.state.nj.us/treasury/dpmc/contract_search.shtml

This project is subject to a Project Labor Agreement (PLA).

Bid Documents may be examined at the DPMC Plan Room, 33 West State Street, 9th Floor, Trenton, NJ 08625 or obtained for a document fee based on the individual trade estimate shown above, as follows: For cost estimate under $100,000 – bid documents are free of charge. For cost estimate over $100,000 – a fee of $65 is required. An additional $25.00 fee is required for mailing of bid documents via United States Postal Service. **Shipping via Fedex is not available. Shipping via UPS is possible if the Contractor wishes to have the documents delivered by UPS.** If shipping via UPS, Bidder is responsible for paying delivery costs as calculated by UPS. For UPS overnight delivery, Bidder must provide a UPS account number. All fees are non-refundable and must be received by the Division before documents will be released. A company check payable to the "Treasurer, State of New Jersey" is required. Contact **Anthony Mangine at Anthony.Mangine@treas.nj.gov** for further information. Mailing address is as follows: Regular Mail (DPMC, P.O. Box 034, Trenton, NJ 08625) or Overnight Mail (DPMC, 33 West State St, 9th Fl, Trenton, NJ 08608).

Pursuant to N.J.A.C. 17:13, this project has been designated as a **Small Business Set-Aside Opportunity**.

Note: This contract includes a goal of awarding 25 percent of the total contract value to either a prime or subcontract level. The firm determined to be the lowest responsible bidder must produce copies of approval notice from the Division of Revenue and Enterprises Services designating the prime or subcontracting firm as a Small Business Enterprise prior to the **award of contract**.

All questions concerning the Small Business Set-Aside Program should be addressed to:

Division of Revenue and Enterprises Services
Small Business Enterprise
Department of the Treasury
33 West State Street, 5th Floor
P.O. Box 026
Trenton, NJ 08625-0026
Phone: 609-292-2146
www.state.nj.us/njbusiness/contracting

Bidders must be classified by the Division under N.J.S.A. 52:35-1 et seq and must submit bid security as provided in Instructions to Bidders and General Conditions, Revised December 2015. No bidder may withdraw his bid for 60 calendar days after the opening. The State may reject any and all bids in accordance with applicable law.

Bidders are required to comply with the requirements of N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27.

Pursuant to Executive Order No. 166, signed by Governor Murphy on July 17, 2020, the Office of the State Comptroller ("OSC") is required to make all approved State contracts for the allocation and expenditure of COVID-19 Recovery Funds available to the public by posting such contracts on an appropriate State website. Such contracts will be posted on the New Jersey transparency website developed by the Governor's Disaster Recovery Office (GDRO Transparency Website).

The contract resulting from this [RFP/RFQ] is subject to the requirements of Executive Order No. 166. Accordingly, the OSC will post a copy of the contract, including the [RFP/RFQ], the winning bidder's proposal and other related contract documents for the above contract on the GDRO Transparency website.

CHRISTOPHER R. GEARY, ASSISTANT DEPUTY DIRECTOR
CONTRACTS & PROCUREMENT
DIVISION OF PROPERTY MANAGEMENT & CONSTRUCTION
STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY
P. O. BOX 034
TRENTON, NJ 08625-0034

Project #P1222-00
Bulletin A
Revised May 8, 2023

STATE OF NEW JERSEY DEPARTMENT OF TREASURY
DIVISION OF PROPERTY MANAGEMENT AND
CONSTRUCTION PO BOX 034, TRENTON, NJ 08625-0034

PROJECT#: P1222-00

A/E: Ikon.5 Architects

DATE: January 8, 2024

BULLETIN A

Bidder must acknowledge receipt of this Bulletin on bid form in the space provided therefor.

This Bulletin is issued for the purpose of amending certain requirements of the original Contract Documents, as noted hereinafter, and is hereby made part of and incorporated in full force as part of the Contract Documents. Unless specifically noted or specified hereinafter, all work shall comply with the applicable provisions of the Contract Documents.

A) DIANE B. ALLEN EQUAL PAY ACT

Pursuant to N.J.S.A. 34:11-56.14(b), any employer, regardless of the location of the employer, who enters into a contract with a public body to perform any public work for the public body shall provide to the Commissioner of the New Jersey Department of Labor and Workforce Development, through certified payroll records required pursuant to P.L.1963, c.150 (N.J.S.A. 34:11-56.25 et seq.), information regarding the gender, race, job title, occupational category, and rate of total compensation of every employee of the employer employed in the State in connection with the contract. The employer shall provide the commissioner, throughout the duration of the contract or contracts, with an update to the information whenever payroll records are required to be submitted pursuant to P.L.1963, c.150 (N.J.S.A. 34:11-56.25 et seq.).

Information regarding the Diane B. Allen Equal Pay Act and its requirements may be obtained from the New Jersey Department of Labor and Workforce Development (LWD) web site at: https://nj.gov/labor/equalpay/equalpay.html

LWD forms may be obtained from the online web site at: https://nj.gov/labor/forms_pdfs/equalpayact/MW-562withoutfein.pdf

B) NOTICE OF EXECUTIVE ORDER 166 REQUIREMENT

Pursuant to Executive Order No. 166, signed by Governor Murphy on July 17, 2020, the Office of the State Comptroller ("OSC") is required to make all approved State contracts for the allocation and expenditure of COVID-19 Recovery Funds available to the public by posting such contracts on an appropriate State website. Such contracts will be posted on the New Jersey transparency website developed by the Governor's Disaster Recovery Office (GDRO Transparency Website).

The contract resulting from this [RFP/RFQ] is subject to the requirements of Executive Order No. 166.

Accordingly, the OSC will post a copy of the contract, including the [RFP/RFQ], the winning bidder's proposal and other related contract documents for the above contract on the GDRO Transparency website.

In submitting its proposal, a bidder/proposer may designate specific information as not subject to disclosure. However, such bidder must have a good faith legal or factual basis to assert that such designated portions of its proposal: (i) are proprietary and confidential financial or commercial information or trade secrets; or (ii) must not be disclosed to protect the personal privacy of an identified individual. The location in the proposal of any such designation should be clearly stated in a cover letter, and a redacted copy of the proposal should be provided. A Bidder's failure to designate such information as confidential in submitting a bid shall result in waiver of such claim.

The State reserves the right to make the determination regarding what is proprietary or confidential and will advise the winning bidder accordingly. The State will not honor any attempt by a winning bidder to designate its entire proposal as proprietary or confidential and will not honor a claim of copyright protection for an entire proposal. In the event of any challenge to the winning bidder's assertion of confidentiality with which the State does not concur, the bidder shall be solely responsible for defending its designation.

C) PROVISIONS FOR FEDERALLY FUNDED CONTRACTS

The Contractor must adhere to the following Federal Contracting Provisions as this Agreement is funded, in whole or in part, by Federal Funds, as required by 2 CFR 200.317, as applicable. See Statement of Assurances dated September 13, 2023 is attached to this Bulletin.

Contractors shall provide written certification to the DPMC that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award. Please see the Certification Regarding Lobbying and Disclosure of Lobbying Activities attached to the Statement of Assurances to be submitted prior to Contract Award.

The Federal CARES Act requires firms to certify prior to Contract Award that they are not a "Covered Entity" under that Act. Please see the Conflicts of Interest Certification attached to the Statement of Assurances to be submitted prior to Contract Award.

D) NJ SUPPLIER DIVERSITY MANAGEMENT SYSTEM – B2GNOW

The State of New Jersey has partnered with software firm B2GNow to develop and implement a Supplier Diversity Management System ("SDMS") which will be used to track spending on all state contracts. As part of implementing the SDMS, all Contractors will have various administrative obligations to use and update the SDMS as follows:

Contractor Responsibilities:

1. The Contractor/Prime Contractor shall create an account on the SDMS, and for this project, the Prime

Contractor shall acknowledge payment of any and all invoices by the State. The Prime Contractor shall further require its subcontractors (and all sub-subcontractors) and material suppliers to also create an account in the SDMS.

2. The Prime Contractor shall indicate in the SDMS whenever it pays its direct subcontractors or material suppliers, in such detail as is required. The Prime Contractor shall further require its subcontractors (and all sub-subcontractors) and material suppliers to acknowledge in the SDMS when they get paid by the Prime Contractor, and also indicate when they pay any sub-subcontractors, or lower tier suppliers, in as much detail as is required.

3. The Prime Contractor shall include in its bid price the level of effort needed to comply with the above noted contractual obligations, and shall require the same of its subcontractors. No change orders will be allowed to reimburse for administrative effort to properly use the SDMS.

4. Training for any personnel who are going to be using the SDMS will be provided by B2GNow, at no cost to the Prime Contractor, subcontractors, material suppliers, or to the State.

E) IMPORTANT CONTRACTOR INFORMATION – FEDERAL SYSTEM FOR AWARD MANAGEMENT (SAM REGISTRATION):

In accordance with N.J.S.A. 52:32-44.1, any firm seeking to be awarded a contract shall provide a written certification to DPMC that neither the firm nor the firm's affiliates are debarred at the federal level from contracting with a federal government agency. Please see the attached Certification of Non-Debarment Form to be submitted prior to Contract Award.

In addition, any firm seeking to be awarded a contract must register with the Federal System for Award Management (SAM) prior to contract award. In order to comply with this requirement, firms must register in SAM at http://www.sam.gov and DPMC will verify the firm's registration in SAM prior to contract award.

F) EMPLOYEE MISCLASSIFICATION

In accordance with Governor Murphy's Executive Order #25 and the Task Force's July 2019 Report, employers are required to properly classify their employees. Workers are presumed to be employees and not independent contractors, unless the employer can demonstrate all three factors of the "ABC Test" below:

A. Such individual has been and will continue to be free from control or direction of the performance of such service, but under his or her contract of service and in fact; and

B. Such service is either outside the usual course of business for which such service is performed, or that such service is performed outside of all places of business of the enterprise for which such service is performed; and

C. Such individual is customarily engaged in an independently established trade, occupation, profession or business.

These factors have been adopted by New Jersey under its Wage & Hour, Wage Payment and Unemployment Insurance Laws to determine whether a worker is properly classified. Under N.J.S.A. 34:1A-1.17 to 1.19, the Department of Labor and Workforce Development has the authority to investigate potential violations of these laws and issue penalties and stop work orders to employers found to be in violation of the laws.

G) NOTICE OF POST-BID MEETING:

a. After the bids are received and opened, the Apparent Low Bidder is required to attend a Post- Bid meeting at the State's offices at the date, time and location listed herein.

b. The Apparent Low Bidder must bring the following to the Post-Bid meeting concerning the work they are performing by their own forces:

i. The itemized estimate used in preparation of the bid submission; and
ii. The estimator, or other authorized person who can discuss the itemized estimate; and
iii. An employee of the company who is authorized to sign the Post-Bid Review meeting minutes.

c. Each of the Apparent Low Bidder's Sub-Contractors listed on the bid proposal form must attend the meeting and bring the following concerning the work they are performing by their forces:
i. The itemized estimate used in preparation of the bid submission; and
ii. The estimator, or other authorized person who can discuss the itemized estimate;

d. A Post-Bid meeting will be held (<u>tentative and to be confirmed after bids are reviewed</u>):

DATE: TBD
TIME: 10:00 AM
LOCATION: DPMC, 20 W State St, Trenton, NJ or Teleconference

H) AMENDMENTS TO THE INSTRUCTIONS TO BIDDERS & GENERAL CONDITIONS OF THE CONTRACT

Amend the Instructions to Bidders of the Contract as follows:

IB 1 BID PROPOSALS

<u>Replace IB 1.5 in its entirety with the following:</u>

IB 1.5 Bid proposals based upon the plans, specifications, general, special and supplementary conditions and bulletins shall be deemed as having been made by the bidder with full knowledge of the conditions therein. Bidders are required to visit the site prior to submitting proposals for the work herein described, and to have thoroughly examined the conditions under which the contract is to be executed, including those reasonably observable conditions of the premises which would hinder, delay, or otherwise affect the performance of the contractor required under the terms of the contract. The State will not allow claims for additional costs as a result of the contractor's failure to become aware of the reasonably observable conditions affecting its required performance. The bidder is required to make appropriate allowances in the preparation of the bid for the accommodation of such conditions. Bidders must warrant in the bid

documents that the bidder is familiar with conditions existing at the site at the time the bid is submitted.

Replace IB 1.8 in its entirety with the following:

The bidder must include in the bid envelope: (1) the proposal signed by the bidder, (2) the executed affidavit of non-collusion and (3) bid security as further described in Section IB6.

Replace IB 1.11 in its entirety with the following:

a. MacBride Principles - Pursuant to N.J.S.A. 52:34-12.2, a bidder must certify prior to contract award to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates pursuant to N.J.S.A. 52:34-12.2, that the bidder has no ongoing business activities in Northern Ireland and does not maintain a physical presence therein through the operation of offices, plants, factories, or similar facilities, either directly or indirectly, through intermediaries, subsidiaries or affiliated companies over which it maintains effective control; or will take lawful steps in good faith to conduct any business operations it has in Northern Ireland in accordance with the MacBride principles of nondiscrimination in employment as set forth in N.J.S.A. 52:18A-89.8 and in conformance with the United Kingdom's Fair Employment (Northern Ireland) Act of 1989, and permit independent monitoring of their compliance with those principles. If a contractor who would otherwise be awarded a contract or agreement does not certify, then the Director may determine, in accordance with applicable law and rules, it is in the best interest of the State to award the contract or agreement to the next responsible bidder who has completed the certification. If the Director finds the contractor to be in violation of the principles which are the subject of this law, s/he shall take such action as may be appropriate and provided for by law, rule or contract, including, but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the contractor in default and seeking debarment or suspension of the contractor. Upon signing the contract, the bidder certifies that it abides by the MacBride Principles.

b. Investment Activities in Iran - Pursuant to N.J.S.A. 52:32-55, et seq., any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must provide, prior to the time a contract is awarded or renewed, a certification on the DPMC form provided to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of Treasury's Chapter 25 list as a person or entity engaging in investment activities in Iran. The Chapter 25 list is found on the Division of Purchase and Property's website at www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf. Bidders must review this list prior to completing the certification. If the Director finds a person or entity to be in violation of law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party. This form must be submitted by the bidder prior to contract award.

IB 2 BID MODIFICATIONS

Replace IB 2.1 in its entirety with the following:

IB 2.1 A bidder may modify its bid proposal by electronic mail or letter at any time prior to the scheduled closing time for receipt of bids, provided such communication is received by the DPMC prior to such closing time. A mailed confirmation of any modification signed by the bidder must have been mailed and time-stamped by the US Postal Service, Fedex, UPS, etc. prior to the specified closing time. Such

confirmation, whether transmitted electronically or by mail, shall be accompanied by a newly executed affidavit of non-collusion.

Replace IB 2.2 in its entirety with the following:

IB 2.2 Communications shall not reveal the basic bid price but shall only provide the amount to be added, subtracted or modified so that the final prices or terms will not be revealed until the sealed proposal is opened. If written confirmation of the modification is not received within two working days after the scheduled closing time, no consideration will be given to the modification.

IB 3 CONSIDERATION OF BIDS

Replace IB 3.1, Items c and d in its entirety with the following:

c. The Director reserves the right to waive any bid requirements where such waiver is permitted by law. Such waiver shall be at the sole discretion of the Director.

d. The Director reserves the right to reject any and all bids, in accordance with applicable law, when such rejection is in the best interests of the State. The Director also may reject the bid of any bidder which, in the Director's judgment, is not responsible or capable of performing the contract obligations based on financial capability, past performance, or experience. A bidder whose bid is so rejected may request a hearing before the Director by filing a written notice.

IB 4 AWARDS

Replace IB 4.5, in its entirety with the following:

IB 4.5 The successful bidder and all of its subcontractors are required to comply with the requirements of N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27 et seq., regarding Equal Employment Opportunity in Public Works Contracts.

IB 5 QUALIFICATION OF BIDDERS

Replace IB 5.1 in its entirety with the following:

IB 5.1 If the successful bidder is a corporation not organized under the laws of the State of New Jersey or is not authorized to do business in this State (foreign corporation), the award of the contract shall be conditioned upon the prompt filing by the said corporation of a certificate to do business in this State and complying with the laws of this State in that regard. This filing must be made with the Division of Revenue and Enterprise Services. No award of contract will be made until the Division of Revenue and Enterprise Services confirms this authorization.

Replace IB 5.2 in its entirety with the following:

IB 5.2 The DPMC requires that each contractor, except in the case of a single contractor, shall perform a minimum of 35 percent of the contract work by the contractor's own forces. However, the Director has the sole discretion to reduce this percentage depending upon the nature and circumstances in any particular

case, if the Director determines that to do so would be in the best ii")>
_ State, and provided that the bidder submits a written request with the original bid proposal.

Replace IB 5.5 in its entirety with the following:

IB 5.5 At the time of the bid due date, the bidder and the subcontractors must be registered in accordance with "The Public Works Contractor Registration Act", N.J.S.A. 34:11-56.48, *et seq*. All questions regarding registration shall be addressed to:

Contractor Registration Unit

New Jersey Department of Labor &
Workforce Development
Division of Wage & Hour Compliance
P O Box 389
Trenton NJ 08625-0389
Telephone: 609-292-9464
FAX: 609-633-8591

Replace IB 5.6 in its entirety with the following:

IB 5.6 In accordance with N.J.S.A. 52:32-44 all contractors and subcontractors providing goods/services to State agencies and authorities are required to provide the contracting agency or authority with proof of registration with the Department of the Treasury, Division of Revenue and Enterprise Services. The basic registration process involves the filing of Form NJ-Reg., which can be filed online at www.state.nj.us/njbgs/services.html or by calling (609) 292-7077 or (609) 292-1730. The bidder and subcontractors must submit a valid Business Registration Certificate prior to contract award.

Pursuant to N.J.S.A. 54:49-4.1, firms who fail to provide a copy of a Business Registration or who provide false information of business registration under the requirements of N.J.S.A. 52:32-44, shall be liable for a penalty of $25 for each day of violation, not to exceed $50,000 for each business registration copy not properly provided under a contract with DPMC.

IB 8 BULLETINS AND INTERPRENTATIONS

Replace IB 8.2 in its entirety with the following:

IB 8.2 Every request for an interpretation relating to clarification or correction of the plans, specifications, or other bid documents must be made in writing, addressed to the architect/engineer and the DPMC Director, and must be received at least five (5) working days prior to the date fixed for the opening of the bids. Any and all interpretations, clarifications or corrections and any supplemental instructions must be issued by the Director in the form of written bulletins and mailed by certified mail, return receipt requested, or by electronic notice to all prospective bidders not later than three (3) working days prior to the date of the opening of bids. All bulletins issued shall become part of the contract documents and must be acknowledged in all bid proposals.

IB 12 OFFER OF GRATUITIES

Replace IB 12.1, Items a, b and f in their entirety with the following:

a. No vendor shall pay, offer to pay, or agree to pay, either directly or indirectly, any fee, commission, compensation, gift, gratuity, or other thing of value of any kind to any State officer or employee or special State officer or employee, as defined by N.J.S.A. 52:13D-13b. and e., in the Department of the Treasury or any other agency with which such vendor transacts or offers or proposes to transact business, or to any member of the immediate family, as defined by N.J.S.A. 52:13D-13i., of any such officer or employee, or any partnership, firm, or corporation with which they are employed or associated, or in which such officer or employee has an interest within the meaning of N.J.S.A. 52:13D-13g.

b. The solicitation of any fee, commission, compensation, gift, gratuity or other thing of value by any State officer or employee or special State officer or employee from any State vendor shall be reported in writing forthwith by the vendor to the Attorney General and the State Ethics Commission.

f. The provisions cited above in paragraphs IB12.1.a. through e. shall not be construed to prohibit a State officer or employee or special State officer or employee from receiving gifts from or contracting with vendors under the same terms and conditions as are offered or made available to members of the general public subject to any guidelines the State Ethics Commission may promulgate under paragraph IB12.1.c. above.

Amend the General Conditions of the Contract as follows:

ARTICLE 1 – GENERAL PROVISIONS

1.5 ASSIGNMENTS

Delete 1.5 in its entirety and replace with the following:

The Contractor shall not assign all or any part of this Contract without the written consent of the Director. Money due (or to become due) the Contractor hereunder shall not be assigned for any purpose whatsoever.

ARTICLE 4 – THE CONTRACTOR

4.1 REVIEW OF THE CONTRACT DOCUMENTS AND FIELD CONDITIONS

Delete 4.1.1 in its entirety and replace with the following:

The Contractor shall thoroughly examine and be familiar with all of the Contract Documents and the Site. The Contractor shall investigate and accurately determine the nature and location of the Work, the current building equipment and systems, labor and material conditions, and all matters which may in any way affect the Work or its performance.

4.3 PERMITS, LAWS, AND REGULATIONS

Delete 4.3.1 in its entirety and replace with the following:

The DPMC will obtain and pay for the construction permits and inspections (building, plumbing, electrical, elevator and fire), required by the Department of Community Affairs (DCA). When permits are issued by DCA, the appropriate licensed Contractors and/or Subcontractors shall be required to fill out the Contractor section of the Sub-Code Technical Section and sign and affix their raised seal thereto.

Delete 4.3.7 in its entirety and replace with the following:

The Contractor shall perform all sewerage disposal work in conformance with the regulations of the State's Department of Environmental Protection.

Delete 4.3.9 in its entirety and replace with the following:

Consistent with section 4.4 and 4.5 of these General Conditions, the Contractor shall be responsible for its own actions and protect, defend and indemnify the State from all fines, penalties or loss incurred for, or by reason of, the violation of any municipal ordinance or regulation or law of the State while the said work is in progress.

Delete 4.3.13 in its entirety and replace with the following:

The Contractor shall establish an approved Silica Health and Safety Program when tasks generating crystalline silica dust are being performed. This program shall include engineering, work practice, and respiratory protection controls to reduce worker exposure to airborne respirable crystalline dust to levels that are as low as reasonably achievable. When tasks are performed that generate airborne crystalline dust, the Contractor will minimize worker exposure to dust by one, or a combination of the following methods:1) dust suppression with water, 2) local exhaust ventilation to a high-efficiency dust collector, and/or 3) appropriate respiratory protection devices. The Contractor shall provide a trained, competent person, as defined by OSHA 29 CFR 1926, on site at all times to implement the Silica Health and Safety Program when tasks generating crystalline silica dust are being performed.

4.4 RESPONSIBILITY FOR THE WORK

Delete 4.4.2 in its entirety and replace with the following:

The Contractor shall be responsible for all damage or destruction caused directly or indirectly by its operations to all parts of the Work, both temporary and permanent, and to all adjoining property at no cost to the State.

4.9 EXCAVATIONS, CUTTING AND PATCHING

Delete 4.9.1 in its entirety and replace with the following:

Soil borings, test pits or other subsurface information may be secured by an independent contractor retained by the State prior to design and construction of the Project and, if obtained, may be included in the Contract Documents for the Contractor's use. The Contractor assumes full responsibility for interpretation of said information.

4.11 EQUIPMENT AND MATERIALS

4.11.5 Delete the second sentence - *Wherever practicable, preference shall be given at all times to material and equipment manufactured or produced in the State of New Jersey, where such preference is reasonable and will best serve the interest of the State.*

4.12 TEMPORARY FACILITIES

Delete 4.12.5, Item a in its entirety and replace with the following:

a. The Contractor shall be responsible for providing and maintaining unobstructed traffic lanes on the designated construction access routes shown on the Contract Drawings or as reasonably required so as to perform the Work. The Contractor shall provide and maintain all reasonably required safety devices. The Contractor shall provide any necessary additional materials, grading and compaction, and shall remove snow and debris as necessary to provide and maintain the access roadway and pedestrian ways in serviceable condition.

4.15 PROTECTION/SAFETY

Delete 4.15.2, Item c in its entirety and replace with the following:

The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including but not limited to rails, night-lights, aircraft warning lights, the posting of danger signs and other warnings against hazards, promulgating safety regulations, notifying owners and users of adjacent utilities and other means of protection against accidental injury or damage to persons and property.

4.18 PROJECT SIGN

Delete 4.18 in its entirety

Add the following paragraphs and sub-paragraphs:

4.18.1 SIGNS AT THE PROJECT SITE

4.18.1.1The Contractor is not required to provide a project sign.

4.18.1.2Signs provided by others will not be permitted at the site.

4.20 DPMC FIELD OFFICE

Delete 4.20.1 in its entirety and replace with the following language:

A separate on-site field office for the use of DPMC personnel is not required for this project.

Delete 4.20.2 in its entirety and replace with the following language:

If required, a separate on-site field office for the use by the Contractor is specified elsewhere in the construction documents.

4.21 PHOTOGRAPHS

Delete 4.21.1 in its entirety and replace with the following language:

The Contractor shall submit pre-construction photographs and videos and monthly progress photographs in duplicate to the DPMC, giving six (6) views of the Work with each application for payment until the Project is completed.

ARTICLE 5 - SUBCONTRACTORS

5.1 SUBCONTRACTORS AND MATERIAL SUPPLIER APPROVALS

Delete 5.1.1 in its entirety and replace with the following:

Upon their execution, but not less than fourteen (14) calendar days prior to Subcontractor mobilization on the site, and/or Subcontractor billing, the Contractor shall forward to the Architect/Engineer on the form provided by the DPMC the names of all its Subcontractors and suppliers, of such others as the DPMC may direct, proposed to perform the principal parts of the Work. The Contractor shall forward the appropriate DPMC form to the Architect/Engineer for approval. Department of Labor and Workforce Development Public Works Contractor Registration and New Jersey Business Registration Certificate are required for all Subcontractors.

Delete 5.1.2 in its entirety and replace with the following:

If the DPMC has objection to any proposed or approved material supplier, the Contractor shall substitute another material supplier acceptable to DPMC. Under no circumstances shall the State be obligated for additional cost due to such substitution.

5.2 CONTRACTOR-SUBCONTRACTOR RELATIONSHIP

Delete 5.2.3 in its entirety

ARTICLE 6 - CONSTRUCTION PROGRESS SCHEDULE
Revise Article 6 as follows:

6.1 GENERAL

Delete 6.1 in its entirety and replace with the following:

The Contractor shall be required to provide Graphic Format progress schedules, as defined in section 6.4 below.

6.2 CONSTRUCTION PROGRESS SCHEDULE (CRITICAL PATH METHOD - CPM CONSULTANT RETAINED BY THE STATE).

Delete 6.2 in its entirety:

6.3 CONSTRUCTION PROGRESS SCHEDULING PROVIDED BY THE CONTRACTOR. Delete

6.3.1 in its entirety and replace with the following language:

6.3.1 Schedule Format: The contractor shall be responsible for preparing, updating and distributing a Gantt chart progress schedule constructed using either Microsoft Project or a Microsoft Project compatible software ["Schedule"] for the project work in accordance with this Sub- paragraph.

6.3.1.1The Schedule must be furnished as a Microsoft Project file and in paper format if required.

6.3.2 Requirements for what is included in the Schedule: The Schedule shall fully describe the project work in sufficient detail to satisfy the architect/ engineer and the Director.

6.3.2.1 The Schedule must be accurate in its depiction of all project activities.

6.3.2.2 The Schedule shall, at a minimum, indicate in suitable detail, all significant features of the work or work activities to be performed, including the placing of orders and anticipated delivery dates for critical items, dates for submissions and approvals of submittals and shop drawings, all change order work , all necessary inspections, the beginning and time duration for all tasks, predecessors and successors for each task , contract milestones, , the NTP, the dates of substantial and final completion of the work and significant Agency or State milestones, when applicable.

6.3.2.3 The Schedule must show the project's critical path.

6.3.2.4 The contractor may be required to add other information to the Schedule including, but not limited to, costs and resources.

6.3.2.5 The Schedule must show the durations in calendar day and acknowledge weekends and State holidays as non-working days, unless otherwise required by the contract.

6.3.2.6 *The Schedule must show the date of Substantial Completion occurring on or before the contract duration end date unless otherwise approved by the architect / engineer and the Director.*

6.3.3 The Schedule as the project record: The contractor agrees that the Schedule shall constitute the official historical record of project's progress.

6.3.4 Approved Schedule: All references herein to the Schedule shall mean a Schedule that is approved by the Project Team including, but not limited to the architect/engineer and the Director.

6.3.4.1 The architect/engineer or Director can request the addition of information to the schedule when it is, in their opinion, necessary to better describe the contractor's work effort prior to granting their approval.

6.3.5 Complying with the Schedule: The contractor shall furnish sufficient labor, materials and equipment to ensure the prosecution of the work in accordance with the Schedule.

6.3.6 Recovery Schedule: The contractor is required to provide a recovery schedule if the completion time for any task deemed necessary for Substantial Completion is not scheduled to be complete prior to the contract duration allotted in the contract.

6.3.6.1 To create the recovery schedule the contractor shall, among other things, revise the sequence of tasks and /or the time for performance of tasks through concurrent operations, additional manpower or, when allowable, overtime or additional shifts etc. until it is assured that Substantial Completion will occur on or before the contract completion date.

6.3.6.2 The State will not allow any additional charges for work performed or made necessary in order for the contractor to comply with the dates shown in the recovery schedule i.e. no additional charges will be allowed the contractor for overtime, additional manpower, equipment, additional shifts, etc., except as provided for elsewhere in the contract.

6.3.6.3 The contractor is required to perform in accordance with the tasks and durations as shown in the recovery schedule including meeting the dates shown for Substantial and Final Completion.

6.3.3.4 The recovery schedule must comply with all requirements of this section and all references to and requirements for the Schedule shall also apply to the recovery schedule.

6.3.7 Submission and review requirements for the project schedule:

6.3.7.1 The contractor must submit and obtain approval of the initial schedule within 30 days after the Notice to Proceed, but in no case later than the first application for payment.

6.3.7.2 Subsequently the contractor must update and submit the project schedule immediately upon the occurrence of a change in an activity or event that may, in the architect's/engineers/s opinion, significantly change the current approved schedule, but at a minimum the schedule must be updated every two weeks and submitted at the bi-weekly progress meeting.

6.3.7.3 The updated schedule must include any activities that were added for any reason including, but not limited to change order work approved to date.

6.3.7.4 The updated progress schedule shall include the progress achieved for each activity that was

scheduled including the actual dates the work was started and completed.

6.4.7.5 The project schedule shall be reviewed in detail at every bi-weekly progress meeting.

6.3.7.6 The absence of bi-weekly meetings does not relieve the contractor of his obligation to provide a schedule every two weeks.

6.3.7.7 The architect/engineer or Director reserves the right to cancel or reschedule the bi- weekly meeting or otherwise take preemptive action if the contractor does not have an approved progress schedule ready for submission as described herein.

6.3.8 Schedules and payments or extensions of time:

6.3.8.1 The contractor will make no claim for, and have no right to, additional payment or extension of time for completion of the work in accordance with the schedule, or any other concession because of any misinterpretation or misunderstanding on the contractor's part of the project schedule, or because of any failure on the contractor's part to become fully acquainted with all conditions relating to the project schedule and the manner in which it will be used on the project, or because of any other contractor's failure to properly participate in the development of a schedule or to perform the contract in accordance with the schedule.

6.3.8.2 A copy of the current, updated and approved schedule is a required attachment to each application for payment.

6.3.8.3 Failure to include a copy of the current, updated and approved schedule with the payment request shall be cause for rejection of the progress payment request.

6.3.9 Two week look ahead/look behind work plan: In addition to the project schedule requirements, the contractor is required to submit a two week look ahead/look behind work plan at every bi-weekly project meeting.

6.3.9.1 The work plan shall focus on the activities that have been completed in the last two weeks and those planned for the next two weeks.

6.3.9.2 The work plan shall be in greater depth than the overall project schedule.

6.3.9.3 The work plan shall identify the contractor's activities that impact the operations and occupants of the State building or facility of the subject project.

6.3.9.4 The work plan shall be a subset of the current schedule and all activities shall coordinate between them.

6.3.9.5 The absence of a bi-weekly meeting shall not relieve the contractor of his responsibility to provide this work plan.

6.3.9.6 This work plan is in addition to and not in lieu of the schedule requirements described in Sub-paragraph 6.4 et al.

6.3.10 The Contractor agrees that no time extension will be granted for time lost due to normal seasonal weather conditions. In order to qualify for consideration for a time extension due to adverse weather conditions, it must be shown by clear and convincing evidence that the weather conditions during a given quarterly period (summer, fall, winter, spring) were more severe than the previous five-year (5) average for the Project geographical area, and that these weather conditions critically impacted the final Project completion date by delaying the performance of work. If abnormal weather losses can be shown to have impacted the Project completion date, a non-compensable time extension will be considered for that portion of the proven weather-related delays, which exceeded normal weather losses that should have been anticipated for the quarterly period in question.

6.3.11 The "Construction Duration" identified on the Bid Proposal Form shall be from the Notice to Proceed to Substantial Completion.

ARTICLE 7 – TIME OF COMPLETION

7.5 DELAY, DISRUPTION AND INTERFERENCE

Delete 7.5.2, Contractor's Damage for Delay, Disruption or Interference in its entirety and replace with the following:

The Contractor shall not be entitled to recovery of money damages from the DPMC caused by delay, disruption or interference with the Contractor's Work except as expressly provided under section 7.5.2 of these General Conditions paragraph. The Contractor expressly agrees that the Contractor's remedy for delay, disruption of interference shall be limited to an extension of time only and that there shall be no recovery of money damages by the Contractor for any delay, disruption or interference with the Contractor's work attributable to any cause whatsoever (other than the State's negligence, bad faith, active interference or other tortious conduct). The Contractor expressly agrees that it shall not be entitled to recover damages due to delay, disruption or interference caused by any of the following:

a. Delayed execution of the contract or any of the causes referenced in paragraph 7.5.2;

b. Any act or omission by any party other than the State, including, but not limited to, the Architect-Engineer, any other Contractor or Subcontractor, any CPM or other consultant retained by the State, any construction manager retained by the State, any agency or instrumentality of the federal government or of any local governmental entity or any utility (e.g., gas, electric, telephone, cable);

c. Any act or omission of any agency or instrumentality of the State , other than the DPMC, including, without limitation, the Department of Environmental Protection and the Department of Community Affairs;

d. Weather;

e. Subsurface conditions of any type including, without limitation rock and underground utilities, whether or not such conditions were reasonably ascertainable to the Contractor at the time of bidding;

f. Use of all or any portion the Project premises prior to completion of the Work to the extent that such use is permitted under the terms of the Contract;

g. Delay in obtaining any permit or approval;

h. Delay caused by the issuance of any court order, injunction or restraining order;

i. Any delay which does not entitle the Contractor to an extension of the Contract Completion Time under Section 6.2.8 of these General Conditions; or

j. Delay attributable to any other cause, other than a cause for which the State is

legally restricted from enforcing a contractual "no damage for delay" clause under N.J.S.A. 2A:58B-3 or any other provision of law restricting or barring the enforcement of such clauses.

In interpreting this provision, the negligence or other wrongful conduct of others, including, without limitation, the Architect/Engineer, the CPM consultant, any construction management firm and any other firm or person retained by the State shall not be imputed to the State. Further, to the extent that the Contractor is entitled to recover monetary damages for delay under this Contract, such recovery shall be limited to actual direct costs incurred on account of the delay, and shall not include profit or other markup on such costs, home office overhead calculated under the Eichleay formula or any other kind of consequential or indirect cost or damage, including but not limited to any alleged cost or damage under the total cost method, the modified total cost method, or productivity factors (costs for inefficiency based on industry productivity factors such as those provided by the Mechanical Contractors Association of America (MCAA) Factors Affecting Labor Productivity).

ARTICLE 9 – PAYMENTS

9.1 INVOICES

Delete 9.1.5, Item a in its entirety and replace with the following:

a. A proper invoice will be deemed to have been received by the Owner when it is received by the person or entity designated by the State to review and sign the invoice on the State's behalf at the address designated in the pre-construction conference for receipt of invoices. Receipt of an invoice by such person or entity shall commence the running of the 20-day period for formal approval and certification as provided under N.J.S.A. 2A:30A-2(a);

Delete 9.1.6 in its entirety and replace with the following:

The provisions of this Article 9 shall not govern the State's payment obligations nor shall they supersede or modify any other contractual provision allowing the withholding of monies from the contractor to the extent that the contractor has not performed in accordance with the provisions of the contract. Nor shall this Article 9 govern the State's payment obligations nor supersede or modify any other contractual provision governing Contractor claims for additional compensation beyond the base contract price and approved change orders.

9.2 INTEREST

Delete 9.2.2 in its entirety and replace with the following:

Interest may be paid by separate payment to the Contractor, but shall be paid within thirty (30) calendar days of payment of the principal amount of the approved invoice.

Delete 9.2.3 in its entirety and replace with the following:

Nothing in this Article 9 shall be construed as entitling the Contractor to payment of interest on any sum withheld by the State for any reason permitted under the Contract or applicable law, or on any claim for additional compensation, over and above sums due under the base Contract or approved change orders.

9.8 MISCELLANEOUS

Delete 9.8.1 in its entirety and replace with the following:

Disputes regarding nonpayment of a Contractor's invoice under this Article 9 may be submitted to non-binding Alternative Dispute Resolution (ADR) upon mutual agreement of the State and the Contractor. In such event, the State and the Contractor shall share equally the fees and expenses of the selected mediator, arbitrator, umpire or other ADR neutral. Provided, however, that nothing herein shall be construed, in whole or in part, as a waiver, release or modification of the provisions of the New Jersey Contractual Liability Act, N.J.S.A. 59:13-1, et seq., which governs claims against the DPMC.

ARTICLE 13 – OTHER REQUIREMENTS

13.1 PREVAILING WAGE

Delete 13.1.1, Item a, 2 in its entirety and replace with the following:

(2) At the time of the bid due date, the Bidder and any Subcontractors identified by the Bidder must be registered in accordance with "The Public Works Contractor Registration Act" (N.J.S.A. 34:11-56.48 et seq.) All questions regarding registration shall be addressed to:

Contractor Registration Unit
New Jersey Department of Labor and Workforce Development
Division of Wage & Hour Compliance
P O Box 389
Trenton NJ 08625-0389
Telephone: 609-292-9464
FAX: 609-633-8591

13.4 INSURANCE

Rename 13.4.1, Item b: "Business/Commercial Automobile Liability":

I) REVISIONS AND/OR CLARIFICATIONS TO THE DRAWINGS, SPECIFICATIONS AND/OR PROJECT REQUIREMENTS;

1. UCC Permits have been paid by the State.

2. All Technical Sections that reference manufacturers and products are hereby revised to include "Or Approved Equal." Technical Sections of the Specifications have not been reissued as part of this Bulletin A.

3. "Approved Equal" requests must be presented in writing during the Question and Answer period of the Bid Phase, after which they will not be considered. The Question and Answer period will be provided by the DPMC during the bid phase or announced at the Pre-Bid Meeting. A response will be provided by the Consultant via Bulletin.

4. As it relates to testing and inspections, all testing and inspections indicated in the specifications shall be performed by a DPMC prequalified firm and arranged and paid for by the Contractor and in no situation by the Owner.

5. INSTALLER, MANUFACTURER & FABRICATOR QUALITY ASSURANCE & QUALIFICATIONS: Eliminate any and all references to “Installer” and/or “Fabricator” quality assurance requirements which specifically pertain to stated minimum required experience in years and number of previous projects. All other requirements for QA/QC, including but not limited to compliance with relevant codes, standards, and manufacturer installation instructions remain applicable.

6. Delete any and all references to “Supplemental General Conditions” and “Special Conditions”.

7. The Investment Activities in Iran Form is attached to this Bulletin. The apparent low bidder will be required to submit this form prior to Contract Award.

8. This project is subject to a Project Labor Agreement (PLA). See attached sample PLA for this project.

9. Wherever there is a reference to AISC Certification: neither the Contractor nor the Fabricator is required to be AISC Certified, but all related work must conform to the AISC Standards referenced in the currently adopted building code.

10. Please note that electrical services to the site will be provided by Jersey Central Power & Light, cable will be provided through Comcast, the site is served by septic and well water, and there is no gas service.

11. Please note that there are no allowances on this project. Delete any reference to “allowances.”

12. Specification Section 01 25 00 – Substitution Procedures (Vol 1): 1.2, B, 1: Delete reference to “Section 00 26 00 – Procurement Substitution Procedures.”

13. Specification Section 01 29 00 – Payment Procedures (Vol 1): 1.2, B, 1: Delete reference to “Section 00 43 73 – Proposed Schedule of Values.”

14. Specification Section 01 50 00 – Temporary Facilities and Controls (Vol 1): 3.5, F: Delete reference to “Section 01 56 39 – Temporary Tree and Plant Protection.” Add “Section 31 13 00 – Tree Protection.”

15. Specification Section 01 77 00 – Closeout Procedures (Vol 1): 3.1, D: Delete reference to “Division 01 – Construction Waste Management and Disposal.”

16. Specification Section 02 82 00 – Asbestos Abatement (Vol 1): 1.4, B: Delete reference to "the City of Newark." Add," All free water and/or wastewater shall be retrieved and added to asbestos waste or solidified with an acceptable polymer and placed in plastic lined leak tight drums." 1.4, C: Delete reference to "the City of Newark." Add, "Wastewater: The Asbestos Contractor shall be responsible for all water filtration systems, and other items necessary to collect, transport, filter, and dispose of the wastewater." The site is served by septic, not sanitary sewer.

17. Specification Section 02 82 60 – Identification and Disposal of Hazardous Waste (Vol 1): Revise Specification Section 02 82 60 title to "Hazardous Waste Disposal." Revise footer to "Hazardous Waste Disposal."

18. Specification Section 02 83 90 – Incidental Disturbance of LCP (Vol 1): Appendix A, B, 4: Delete reference to "NYSDEC."

19. Specification Section 02 84 00 – Universal and Regulated Waste (Vol 1): 1.2, C: Delete reference to "Section 02 82 60 – Identification and Disposal of Hazardous Waste." Add "Section 02 82 60 – Hazardous Waste Disposal."

20. Specification Section 03 30 00 – Cast-in-Place Concrete (Vol 1): 1.2, B, 1: Delete reference to "Division 01 – Construction Waste Management and Disposal." 1.2, B, 11: Delete reference to "Division 07 – Expansion Joint Covers."

21. Specification Section 04 72 00 – Cast Stone Masonry (Vol 1): 2.6, A: Delete reference to "Section 04 26 13 – Masonry Veneer." Add "Section 04 43 13.13 – Anchored Stone Masonry Veneer."

22. Specification Section 05 12 00 – Structural Steel Framing (Vol 1): 1.2, B, 1: Delete reference to "Division 01 – Construction Waste Management and Disposal." 1.2, B, 8: Delete reference to "Division 07 – Expansion Joint Covers."

23. Specification Section 07 56 00 – Cold Fluid Applied Roofing / Waterproofing (Vol 1): 1.2, C: Delete reference to "Section 15 14 00 – Plumbing Fixtures: Roof Drain and Plumbing Vent Flashing Flanges." Add "Section 22 14 23 – Storm Drainage Piping Specialties."

24. Specification Section 07 62 00 – Sheet Metal Flashing and Trim (Vol 1): 1.1, B, 3: Delete reference to "Section 07 71 00 – Roof Specialties." 1.1, B, 4: Delete reference to "Section 07 72 00 – Roof Accessories."

25. Specification Section 07 92 00 – Joint Sealants (Vol 1): 1.1, B, 3: Delete reference to "Section – 32 13 73 – Concrete Paving Joint Sealants." Add "Section 32 12 64 – Pavement Joint Sealants."

26. Specification Section 07 92 10 – Sitework Joint Sealants (Vol 1): 1.2, B, 1: Delete reference to "Division 33 – Concrete Paving." Add "Division 03 – Cast-in-Place Concrete."

27. Specification Section 08 71 00 – Door Hardware (Vol 1): 2.2, A, 5: Add manufacturers Bommer Industries, Stanley, and "or approved equal." 2.2, B, 1: Add manufacturers Markar, Ives, and "or approved equal." 2.3, A, 2: Add manufacturers Stanley, Ives, and "or approved equal." 2.4, A, 5: Add manufacturers Burns Manufacturing, Hiawatha, and "or approved equal." 2.5, B, 1: Add manufacturers Corbin Russwin, Medeco, and "or approved equal." 2.5, D, 1: Add manufacturers Corbin Russwin, Medeco, and "or approved equal." 2.7, A, 2: Add manufacturers Corbin Russwin, Schlage, and "or approved equal." 2.9, A, 3: Add manufacturers CR Laurence, PRL, and "or approved equal." 2.10, B, 1: Add manufacturers Corbin Russwin, Precision, and "or approved equal." 2.10, C, 6: Add manufacturers CR Laurence, PRL, and "or approved equal." 2.11, A, 3: Add manufacturers Corbin Russwin, Precision, and "or approved equal." 2.12, B, 1: Add manufacturers Corbin Russwin, Sargent, and "or approved equal." 2.12, C, 1: Add manufacturers Corbin Russwin, Sargent, and "or approved equal." 2.13, I: Add manufacturers Besam, Stanley, and "or approved equal." 2.14, A, 1: Add manufacturers LCN, Sargent, and "or approved equal." 2.15, A, 6: Add manufacturers Burns Manufacturing, Trimco, and "or approved equal." 2.16, B, 1: Add manufacturers Ives, Reese, and "or approved equal." 2.17, G: Add manufacturers National Guard, Reese, and "or approved equal." 2.18, A, 1: Add manufacturers SDC, and "or approved equal." 2.18, B, 1: Add manufacturers SDC, and "or approved equal." 2.18, C, A, 2: Add manufacturers Altronix, Alarm Control, and "or approved equal."

28. Specification Section 08 80 00 – Glazing (Vol 1): 1.7, E, 1: Delete reference to "Section 08 51 13 – Aluminum Windows."

29. Specification Section 09 29 00 – Gypsum Board (Vol 1): 2.4, A, 1, a: Add manufacturers Hardie Backerboard, Perma-Base Cement Board.

30. Specification Section 09 65 19 – Resilient Tile Flooring (Vol 1): 3.1, A: Delete reference to "Section 09 05 61 – Common Work Results for Flooring Preparation." 3.2, B, 1: Delete reference to "Section 09 05 61 – Common Work Results for Flooring Preparation."

31. Specification Section 11 30 13 – Residential Appliances (Vol 1): 1.2, B, 1: Delete reference to "Section 22 41 00 – Residential Plumbing Fixtures."

32. Specification Section 22 05 29 – Hangers and Supports for Plumbing Piping and Equipment (Vol 2): 3.6, A: Delete reference to "Section 09 91 13 – Exterior Painting."

33. Specification Section 22 07 19 – Plumbing Piping Insulation (Vol 2): 3.8, A: Delete reference to "Section 09 91 13 – Exterior Painting."

34. Specification Section 22 11 13 – Facility Water Distribution Piping (Vol 2): 1.2, B, 1: Delete reference to "Division 01 – Construction Waste Management and Disposal." 3.1, A: Delete reference to "Division 01 – Construction Waste Management and Disposal."

35. Specification Section 22 11 16 – Domestic Water Piping (Vol 2): 3.2, I: Remove reference to "Section 22 05 48 – Vibration and Seismic Controls for Plumbing Piping and Equipment." 3.5, A: Delete reference to "Section 22 05 48 – Vibration and Seismic Controls for Plumbing Piping and Equipment."

36. Specification Section 22 31 00 – Domestic Water Softeners (Vol 2): 3.1, A, 2: Delete reference to "Section 22 05 48 – Vibration and Seismic Controls for Plumbing Piping and Equipment." 3.1, A, 3: Remove reference to "Section 22 05 48 – Vibration and Seismic Controls for Plumbing Piping and Equipment." 3.2, C, 1: Delete reference to "Section 22 05 23.13 – Butterfly Valves for Plumbing Piping." 3.2, C, 1: Delete reference to "Section 22 05 23.14 – Check Valves for Plumbing Piping." 3.2, C, 1: Delete reference to "Section 22 05 23.15 – Gate Valves for Plumbing Piping." 3.2, E, 1: Delete reference to "Section 22 05 23.13 – Butterfly Valves for Plumbing Piping." 3.2, E, 1: Delete reference to "Section 22 05 23.14 – Check Valves for Plumbing Piping." 3.2, E, 1: Delete reference to "Section 22 05 23.15 – Gate Valves for Plumbing Piping." 2.2, A: Add, "Manufacturers: Subject to compliance with requirements, provide products by one of the following: Culligan International Company, Marlo Incorporated, WATTS; A Watts Water Technologies Company, or approved equal."

37. Specification Section 22 32 00 – Domestic Water Filtration Equipment (Vol 2): 2.1, A: Add, "Manufacturers: Subject to compliance with requirements, provide products by one of the following: Aquion, Inc., Marlo Incorporated, WATTS; A Watts Water Technologies Company, or approved equal." 2.2, A, 1: Add, "Manufacturers: Subject to compliance with requirements, provide products by one of the following: Aquion, Inc., Marlo Incorporated, WATTS; A Watts Water Technologies Company, or approved equal." 2.2, B, 1: Add, "Manufacturers: Subject to compliance with requirements, provide products by one of the following: Aquion, Inc., Marlo Incorporated, WATTS; A Watts Water Technologies Company, or approved equal." 2.3, A: Add, "Manufacturers: Subject to compliance with requirements, provide products by one of the following: Aquion, Inc., Marlo Incorporated, WATTS; A Watts Water Technologies Company, or approved equal." 2.4, A, 1: Add, "Manufacturers: Subject to compliance with requirements, provide products by one of the following: Aquion, Inc., Marlo Incorporated, WATTS; A Watts Water Technologies Company, or approved equal." 2.4, B, 1: Add, "Manufacturers: Subject to compliance with requirements, provide products by one of the following: Aquion, Inc., Marlo Incorporated, WATTS; A Watts Water Technologies Company, or approved equal." 2.4, C, 1: Add, "Manufacturers: Subject to compliance with requirements, provide products by one of the following: Aquion, Inc., Marlo Incorporated, WATTS; A Watts Water Technologies Company, or approved equal." 2.5, A: Add, "Manufacturers: Subject to compliance with requirements, provide products by one of the following: LAKOS Filtration Solutions, PEP Filters, Inc., Puroflux Corporation, Rosedale Products, Inc., or approved equal." 3.8, D, 1: Delete reference to "Section 22 05 23.13 – Butterfly Valves for Plumbing Piping." 3.8, D, 1: Delete reference to "Section 22 05 23.15 – Gate Valves for Plumbing Piping." 3.8, F, 1: Delete reference to "Section 22 05 23.13 – Butterfly Valves for Plumbing Piping." 3.8, F, 1: Delete reference to "Section 22 05 23.14 – Check Valves for Plumbing Piping." 3.8, F, 1: Delete reference to "Section 22 05 23.15 – Gate Valves for Plumbing Piping."

38. Specification Section 22 32 00 – Electric, Domestic Water Heaters (Vol 2): 3.1, C, 1: Delete reference to "Section 22 05 23.13 – Butterfly Valves for Plumbing Piping." 3.1, C, 1: Delete reference to "Section 22 05 23.15 – Gate Valves for Plumbing Piping." 3.1, I: Delete reference to "Section 22 05 23.13 – Butterfly Valves for Plumbing Piping." 3.1, I: Delete reference to "Section 22 05 23.15 – Gate Valves for Plumbing Piping."

39. Specification Section 22 42 16.16 – Commercial Sinks (Vol 2): 1.2, B, 1 Delete reference to "Section 22 41 00 – Residential Plumbing Fixtures." 3.2, E, 1: Delete reference to "Section 22 05 23.15 – Gate Valves for Plumbing Piping."

40. Specification Section 22 47 13 – Drinking Fountains (Vol 2): 3.2, C: Delete reference to "Section 22 05 23.15 – Gate Valves for Plumbing Piping." 3.3, C: Delete reference to "Section 22 05 23.15 – Gate Valves for Plumbing Piping."

41. Specification Section 23 05 29 – Hangers and Supports for HVAC Piping and Equipment (Vol 2): 1.2, B, 2: Delete reference to "Section 23 05 16 – Expansion Fittings and Loops for HVAC Piping." 3.2, E, 2: Delete reference to "Division 07 – Roof Accessories."

42. Specification Section 23 05 48.13 – Vibration Controls for HVAC (Vol 2): 1.2, B, 1: Delete reference to "Division 22 – Vibration and Seismic Controls for Plumbing Piping and Equipment."

43. Specification Section 23 05 93 – Testing, Adjusting, and Balancing for HVAC (Vol 2): 3.3, B, 3: Delete reference to "Section 23 07 16 – HVAC Equipment Insulation."

44. Specification Section 23 07 13 – Duct Insulation (Vol 2): 1.2, C, 1: Delete reference to "Section 23 07 16 – HVAC Equipment Insulation." 3.8, A: Delete reference to "Section 09 91 13 – Exterior Painting."

45. Add Specification Section 23 07 19 – HVAC Piping Insulation.

46. Specification Section 23 09 23 – Direct Digital Control (DDC) System for HVAC (Vol 2): 1.2, B, 1, a: Delete reference to "Section 26 05 23 – Control-Voltage Electrical Power Cables." 1.2, B, 1, b: Delete reference to "Section 27 15 13 – Communications Copper Horizontal Cabling." 1.2, B, 1, c: Delete reference to "Section 27 15 23 – Communications Optical Fiber Horizontal Cabling." 1.2, B, 4: Delete reference to "Section 27 05 53 – Identification for Communications Systems." 2.20, D, 2: Delete reference to "Section 26 05 23 – Control-Voltage Electrical Power Cables." 2.22, A: Remove reference to "Division 27 – Communications Copper Backbone Cabling." 2.22, B: Delete reference to "Section 27 15 23 – Communications Optical Fiber Horizontal Cabling." 3.2, B, 2, a: Delete reference to "Section 26 09 13 – Electrical Power Monitoring and Control." 3.2, B, 2, b: Delete reference to "Section 26 09 26 – Lighting Control Panelboards." 3.2, B, 2, d: Delete reference to "Section 28 31 21 – Area and Perimeter Intrusion Detection." 3.3, A, 2: Delete reference to "Section 23 09 23.12 – Control Dampers." 3.3, A, 3: Remove reference to "Section 23 09 23.14 – Flow Instruments." 3.3, A, 3: Delete reference to "Section 23 09 23.23 – Pressure Instruments." 3.3, A, 4: Delete reference to "Section 23 09 23.27 – Temperature Instruments." 3.13, B, 1: Delete reference to "Section 26 05 23 – Control-Voltage Electrical Power Cables." 3.13, B, 2: Delete reference to "Division 27 – Communications Copper Backbone Cabling." 3.13, B, 3: Delete reference to "Section 27 15 13 – Communications Copper Horizontal Cabling." 3.14, A: Delete reference to "Division 27 – Communications Copper Backbone Cabling." 3.14, B: Delete reference to "Section 27 15 23 – Communications Optical Fiber Horizontal Cabling."

47. Specification Section 23 23 00 – Refrigerant Piping (Vol 2): 3.2, J: Delete reference to "Section 23 09 93 – Sequence of Operations for HVAC Controls." Add "Section 23 09 23 – Direct Digital Controls (DDC) for HVAC."

48. Specification Section 23 31 13 – Metal Ducts (Vol 2): 1.2, B, 2: Delete reference to "Section 23 31 19 – HVAC Casings." 3.6, A: Delete reference to "Section 09 91 13 – Exterior Painting."

49. Specification Section 23 34 3.13 – Commercial Air Curtains (Vol 2): 3.4, B: Delete reference to "Section 26 05 23 – Control-Voltage Electrical Power Cables."

50. Specification Section 23 36 00 – Air Terminal Units (Vol 2): 3.5, B: Delete reference to "Section 26 05 23 – Control-Voltage Electrical Power Cables."

51. Specification Section 23 41 00 – Particulate Air Filtration (Vol 2): 3.4, D: Delete reference to "Section 26 05 23 – Control-Voltage Electrical Power Cables."

52. Specification Section 23 74 33 – Dedicated Outdoor Air Units (Vol 2): 3.5, B: Delete reference to "Section 26 05 23 – Control-Voltage Electrical Power Cables."

53. Specification Section 23 81 26 – Split-System Air-Conditioners (Vol 2): 2.4, A: Delete reference to "Section 23 09 93.11 – Sequence of Operations for HVAC DDC." 3.1, C, 2: Delete reference to "Section 23 05 48 – Vibration and Seismic Controls for HVAC." Add "Section 23 05 48 – Vibration Controls for HVAC." 3.8, A: Delete reference to "Section 23 05 48 – Vibration and Seismic Controls for HVAC." Add "Section 23 05 48 – Vibration Controls for HVAC."

54. Specification Section 23 81 29 – Variable-Refrigerant-Flow HVAC Systems (Vol 2): 3.8, F, 2: Delete reference to "Division 07 – Roof Accessories."

55. Specification Section 23 83 13 – Radiant Heating Electric Cables (Vol 2): 2.3, A: Delete reference to "Section 23 09 93.11 – Sequence of Operations for HVAC DDC."

56. Specification Section 26 05 26 – Grounding and Bonding for Electrical Systems (Vol 2): 3.3, 19: Delete reference to "Section 26 05 43 – Underground Ducts and Raceways for Electrical Systems."

57. Specification Section 26 05 33 – Raceways and Boxes for Electrical Systems (Vol 2): 1.2, B, 1: Delete reference to "Section 26 05 43 – Underground Ducts and Raceways for Electrical Systems."

58. Specification Section 26 09 23 – Lighting Control Devices (Vol 2): 2.1, 2: Delete reference to "Section 26 09 43.13 – Addressable-Fixture Lighting Controls." 2.1, 2: Delete reference to "Section 26 09 43.23 – Relay-Based Lighting Controls." 3.7, A: Delete reference to "Section 26 09 43.13 – Addressable-Fixture Lighting Controls." 3.7, A: Delete reference to "Section 26 09 43.23 – Relay-Based Lighting Controls."

59. Specification Section 26 24 16 – Panelboards (Vol 2): 1.2, B, 2: Delete reference to "Division 26 – Electrical System Studies." 2.2, A: Delete reference to "Section 26 05 48.16 – Seismic Controls for Electrical Systems." 3.2, H, 1: Delete reference to "Division 26 – Overcurrent Protective Device Studies." 3.5, A: Delete reference to "Division 26 – Overcurrent Device Studies."

60. Specification Section 26 27 13 – Electricity Metering (Vol 2): 2.1, B, 1: Delete reference to "Section 26 05 23 – Control-Voltage Electrical Power Cables." 2.1, E, 1: Delete reference to "Section 26 24 13 – Switchboards." 2.1, F, 1: Delete reference to "Section 26 05 73.19 – Arc Flash Studies." 2.2, A: Delete reference to "Section 26 24 13 – Switchboards." 2.4, E: Delete reference to "Section 26 05 23 – Control-

Voltage Electrical Power Cables." 3.1, F, 2: Delete reference to "Section 27 15 13 – Communications Copper Horizontal Cabling."

61. Specification Section 26 28 16 – Enclosed Switches and Circuit Breakers (Vol 2): 1.2, B, 2: Delete reference to "Division 26 – Over Current Protective Device Studies."

62. Specification Section 26 29 13.03 – Manual and Magnetic Motor Controllers (Vol 2): 1.2, B, 2: Delete reference to "Section 26 05 73.19 – Arc-Flash Studies." 2.11, B, 1: Delete reference to "Section 26 05 73.19 – Arc-Flash Studies." 3.2, D: Delete reference to "Section 26 05 48.16 – Seismic Controls for Electrical Systems."

63. Specification Section 26 43 13 – Surge Protection for Low-Voltage Electrical Power Citcuits (Vol 2): 1.2, B, 1: Delete reference to "Section 26 24 13 – Switchboards."

64. Specification Section 26 51 19 – LED Interior Lighting (Vol 2): 1.2, C, 2: Delete reference to "Section 26 09 43.13 – Addressable-Fixture Lighting Controls."

65. Add Specification Section 27 05 00 – Common Work Results for Communications.

66. Specification Section 27 05 28 – Pathways for Communications Systems (Vol 2): 3.2, E: Remove reference to "Section 27 05 44 – Sleeves and Sleeve Seals for Communications Pathways and Cabling." 3.2, D: Remove reference to "Section 27 05 29 – Hangers and Supports for Communications Systems." 3.3, A, 7: Remove reference to "Section 27 05 53 – Identification for Communications Systems." 3.5, A: Remove reference to "Section 27 05 44 – Sleeves and Sleeve Seals for Communications Pathways and Cabling."

67. Specification Section 27 11 00 – Communications Equipment Room Fittings (Vol 2): 1.2, C: Delete reference to "Division 26 – Cable Trays for Electrical Systems." 1.2, G: Delete reference to "Division 26 – Vibration and Seismic Controls for Electrical Systems." 1.2, H: Delete reference to "Division 26 – Overcurrent Protective Device Coordination Study." 2.1, C: Delete reference to "Division 26 – Cable Trays for Electrical Systems."

68. Add Specification Section 27 15 00 – Communications Horizontal.

69. Add Specification Section 27 16 00 – Communications Connecting Cords, Devices and Adapters.

70. Specification Section 27 41 16 – Audiovisual Systems (Vol 2): 1.3: Delete this section. 1.22, C: Delete this section.

71. Add Specification Section 28 05 00 – Common Work Results for Electronic Safety and Security.

72. Specification Section 28 10 00 – Electronic Access Control and Intrusion Detection (Vol 2): 1.2, E: Delete reference to "Division 26 – Vibration and Seismic Controls for Electrical Systems." 1.2, F: Delete reference to "Division 26 – Overcurrent Protective Device Coordination Study."

73. Specification Section 28 20 00 – Electronic Surveillance (Vol 2): 1.2, B: Delete reference to "Division 26 – Cable Trays for Electrical Systems." 1.2, F: Delete reference to "Division 26 – Vibration and Seismic Controls for Electrical Systems." 1.2, G: Delete reference to "Division 26 – Overcurrent Protective Device Coordination Study." 1.2, H: Delete reference to "Division 27 – Communications Copper Backbone Cabling."

74. Specification Section 28 46 21.11 – Addressable Fire-Alarm Systems (Vol 2): 1.2, C, 3: Delete reference to "Division 28 – Air Sampling Detection Systems." 2.15, A, 1: Delete reference to "Section 23 09 93.11 – Sequence of Operations for HVAC DDC."

75. Specification Section 31 23 16 – Trenching for Utilities (Vol 2): 3.1, A: Delete reference to "Division 01 – Construction Waste Management and Disposal."

76. Specification Section 31 23 19 – Dewatering (Vol 2): 1.2, C: Delete reference to "Division 01 – Construction Waste Management and Disposal."

77. Specification Section 31 27 70 – Curb, Sidewalk and Pavement (Vol 2): 1.2, A, 1: Delete reference to "Division 01 – Construction Waste Management and Disposal." 3.2, A: Delete reference to "Division 01 – Construction Waste Management and Disposal."

78. Specification Section 32 11 60 – Stone Aggregate (Vol 2): 1.2, B, 3: Delete reference to "Division 33 – Concrete Paving." Add "Division 03 – Cast-in-Place Concrete."

79. Specification Section 32 12 10 – Specialty Asphalt Paving (Vol 2): 2.4, A, 2: Add suppliers Silvi Materials (355 Newbold Rd, Fairless Hills, PA 19030, 215-295-0777, www.silvi.com), Mount Construction, Inc. (427 S White Horse Pike, Berlin, NJ 08009, 856-768-8493, www.themountgroup.com), and "or approved equal."

80. Specification Section 32 12 16 – Bituminous Concrete Pavement (Vol 2): 1.2, A, 1: Delete reference to "Division 01 – Construction Waste Management and Disposal." 3.1, A: Delete reference to "Division 01 – Construction Waste Management and Disposal."

81. Specification Section 32 12 64 – Pavement Joint Sealants (Vol 2): 1.2, A, 1: Delete reference to "Division 01 – Construction Waste Management and Disposal." 1.3, B, 1: Delete reference to "Division 01 – Construction Waste Management and Disposal." 3.1, A: Delete reference to "Division 01 – Construction Waste Management and Disposal."

82. Specification Section 32 13 20 – Landscape Concrete Finishes (Vol 2): 1.3, C: Delete reference to "Division 33 – Concrete Paving." Add "Division 03 – Cast-in-Place Concrete." 2.1, A: Delete reference to "Division 33 – Concrete Paving." Add "Division 03 – Cast-in-Place Concrete." 2.2, A: Delete reference to "Division 33 – Concrete Paving." Add "Division 03 – Cast-in-Place Concrete." 2.3, A: Delete reference to "Division 33 – Concrete Paving." Add "Division 03 – Cast-in-Place Concrete." 2.3, B: Delete reference to "Division 33 – Concrete Paving." Add "Division 03 – Cast-in-Place Concrete." 2.3, F: Delete reference to "Division 33 – Concrete Paving." Add "Division 03 – Cast-in-Place Concrete."

83. Specification Section 32 92 10 – Turf Grasses (Vol 2): 1.2, B, 5: Delete reference to "Division 33 – Subdrainage." Add "Division 33 – Planting Drainage Systems."

84. Specification Section 32 97 00 – Green Roof System (Vol 2): 1.4, A, 1: Add "The vegetated roof assemblies are continuous systems and not trays." 1.4, A, 2: Delete this section.

85. Specification Section 33 42 00 – Stormwater Conveyance (Vol 2): 1.2, B, 2: Delete reference to "Division 33 – Subdrainage."

86. Interpretive Specification Section 00300 – Bid Form Instructions (Vol 3): Delete Specification Section 00300 – Bid Form Instructions in its entirety.

87. Interpretive Specification Section 00301 – Bid Form Description (Vol 3): 1.03: Delete this section from the specification. 1.05: Delete this section.

88. Interpretive Specification Section 05500 – Metal Fabrication and Finishing (Vol 3): 1.03, A: Delete reference "Certified by AISC Fabricator Certifications Program."

89. Interpretive Specification Section 08800 – Glass and Glazing (Vol 3): 2.01, A, 1: Add manufacturers Talas Art Sorb Silica Beads (330 Morgan Ave, Brooklyn, NY 11211, 212-219-0770, www.talasonline.com), SmallCorp Silica Gel Beads (19 Butternut Street, Greenfield, MA 01301, 800-392-9500, www.smallcorp.com), Gaylord Archival Silica Gel Beads (PO Box 4901 Syracuse, NY 13221, 1-800-448-6160, www.gaylord.com), and "or approved equal."

90. Interpretive Specification Section 09900 – Painting and Finishing (Vol 3): 2.01, A, 1: Add manufacturers Sherwin-Williams (101 W. Prospect Ave, Cleveland, Ohio 44115, 216-566-2000, www.sherwin-williams.com), PPG Pittsburgh Paints (800-441-9695, www.ppgpaints.com), Behr Premium Plus (1-800-854-0133, www.behr.com), and "or approved equal."

91. Interpretive Specification Section 12200 – Artifacts, Objects, and Models (Vol 3): 2.01: Add manufacturers Uniboard NU Green MR50 (5555 Ernest-Cormier Street, Suite 100, Laval, Québec, H7C 2S9, Canada, 1-800-263-5240, www.uniboard.com), Georgia-Pacific Ultrastock MR (133 Peachtree Street, NE, Atlanta, GA 30303, 1-800-652-4777, www.buildgp.com), Roseburg Medite II (3660 Gateway Street, Springfield, OR 97477, 541-679-3311, www.roseburg.com), and "or approved equal."

92. Interpretive Specification Appendix 9 – Mandatory Bid Form (Vol 3): Delete Appendix 9 – Mandatory Bid Form in its entirety.

ATTACHMENTS:

1. Certification of Non-Debarment Form
2. Investment Activities in Iran Form
3. Sample Project Labor Agreement (PLA)
4. Statement of Assurances dated September 13, 2023
5. Certification Regarding Lobbying & Disclosure of Lobbying Activities Form

6. Conflicts of Interest Certification Form
7. Specification Section 23 07 19 – HVAC Piping Insulation
8. Specification Section 27 05 00 – Common Work Results for Communications
9. Specification Section 27 15 00 – Communications Horizontal Cabling
10. Specification Section 27 16 00 – Communications Connecting Cords, Devices and Adapters
11. Specification Section 28 05 00 – Common Work Results for Electronic Safety and Security

END OF BULLETIN A

NEW JERSEY DEPARTMENT OF THE TREASURY

DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION

CERTIFICATION OF NON-DEBARMENT FORM

DPMC Contract No: _____

Contract Name: _____

Contractor Name: _____

Contractor Address: _____

CERTIFICATION

Pursuant to N.J.S.A. 52:32-44.1, I, the undersigned, being duly authorized to complete this certification on behalf of the above-named Contractor, do hereby certify and attest, under the pains and penalties of perjury, that:

- The Contractor is not debarred at the federal level from contracting with the federal government;
- None of the parent entities, subsidiaries, related entities or affiliates of the Contractor are debarred at the federal level from contracting with the federal government;
- I am authorized to execute this certification on behalf of the Contractor;
- I acknowledge that the State of New Jersey is relying on the information contained herein;
- I acknowledge that I am under a continuing obligation from the date of this certification through the completion of any contract(s) with DPMC to notify DPMC in writing of any changes to the information contained herein; and
- I acknowledge that it is a criminal offense to make a false statement or misrepresentation in this certification. If I do so, I will be subject to criminal prosecution, and such misrepresentation may be considered fraudulent, and/or a material breach of the Contractor's contract(s) with the State of New Jersey.

If DPMC finds a person or entity to be in violation of the law, it shall take action as may be appropriate and permitted by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and/or seeking debarment or suspension of the party.

Signature: _____

Print Name: _____

Title: _____

Date: _____

DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN FORM

BID SOLICITATION # AND TITLE: _____

BIDDER NAME: _____

Pursuant to N.J.S.A. 52:32-57, et seq. (P.L. 2012, c.25 and P.L. 2021, c.4) any person or entity that submits a bid or proposalor otherwise proposes to enter into or renew a contract with the State of New Jersey must certify that neither the person nor entity, nor any of its parents,subsidiaries, or affiliates, is identified on the New Jersey Department of the Treasury's Chapter 25 List as a person or entity engaged in investment activities in Iran. The Chapter 25 list is found at https://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf. Bidders must review this list prior to completing the below certification. If the Director of the Division of Property Management and Construction finds a person or entity to be in violation of the law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to; imposing sanctions, seeking compliance, recovering damages, declaring the party in default and/or seeking debarment or suspension of the party.

CHECK THE APPROPRIATE BOX

☐ I certify, pursuant to N.J.S.A. 52:32-57, et seq. (P.L. 2012, c.25 and P.L. 2021, c.4), that neither the Bidder listed above nor any of its parents, subsidiaries, or affiliates is listed on the New Jersey Department of the Treasury'sChapter 25 List of entities determined to be engaged in prohibited activities in Iran.

OR

☐ I am unable to certify as above because the Bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the New Jersey Department of the Treasury's Chapter 25 List. I will provide a detailed, accurate and precise description of the activities of the Bidder, or one of its parents, subsidiaries or affiliates, has engaged in regarding investment activities in Iran by completing the information requested below.

Entity Engaged in Investment Activities _____
Relationship to Bidder _____
Description of Activities _____
_____
Duration of Engagement _____
Anticipated Cessation Date _____
Attach Additional Sheets If Necessary.

CERTIFICATION

I, the undersigned, certify that I am authorized to execute this certification on behalf of the Bidder, that the foregoing information and any attachments hereto, to the best of my knowledge are true and complete. I acknowledge that the State of New Jersey is relying on the information contained herein, and that the Bidder is under a continuing obligation from the date of this certification through the completion of any contract(s) with the State to notify the State 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. If I do so, I will be subject to criminal prosecution under the law, and it will constitutea material breach of my agreement(s) with the State, permitting the State to declare any contract(s) resulting from this certification void and unenforceable.

_____ _____
Signature Date

_____
Print Name and Title

PROJECT LABOR AGREEMENT

COVERING NEW VISITOR CENTER,

WASHINGTON CROSSING STATE PARK, MERCER COUNTY

ARTICLE 1-PREAMBLE

WHEREAS, the State of New Jersey, Department of the Treasury, Division of Property Management and Construction (DPMC) (the "Owner"), desires to provide for the efficient, safe, quality, and timely completion of construction of the "New Visitor Center, Washington State Park, Mercer County" (the "Project") in a manner designed to afford lower costs to the Owner and the public it represents, and the advancement of public policy objectives; and

WHEREAS, this Project Labor Agreement will foster the achievement of these goals, inter alia by:

(1) Ensuring a reliable source of skilled and experienced labor;

(2) Standardizing the terms and conditions governing the employment of labor on the Project;

(3) Permitting wide flexibility in work scheduling and shift hours and times from those which otherwise might obtain;

(4) Receiving negotiated adjustments as to work rules and staffing requirements from those which otherwise might obtain;

(5) Providing comprehensive and standardized mechanisms for the settlement of work disputes, including those relating to jurisdiction;

(6) Avoiding the costly delays of potential strikes, slowdowns, walkouts, picketing and other disruptions arising from work disputes and promote labor harmony and peace for the duration of the Projects;

(7) Furthering public policy objectives as to improved employment opportunities for minorities, women and the economically disadvantaged in the construction industry; and

(8) Expediting the construction process;

WHEREAS, the signatory Unions desire the stability, security and work opportunities afforded by a Project Labor Agreement;

WHEREAS, the Parties desire to maximize Project safety conditions for both workers and public,

NOW, THEREFORE, the Parties enter into this Project Labor Agreement:

SECTION 1: PARTIES TO THE AGREEMENT

This is a Project Labor Agreement ("Agreement") entered into by and between DPMC (the "Owner") and its successors and assigns, for certain construction work to be performed on the Project and by the Mercer County and Vicinity Building and Construction Trades Council ("the County Council"), on behalf of itself and its affiliated local union members, and the signatory Local Unions on behalf of themselves and their members.

ARTICLE 2 – GENERAL CONDITIONS

SECTION 1: DEFINITIONS

Throughout this Agreement, the Union parties and the signatory Local Unions and County Council are referred to singularly and collectively as "Union(s)." Where specific reference is made to "Local Unions," that phrase is sometimes used. The term "Contractor(s)" shall include all signatory contractors, and their subcontractors of whatever tier, engaged in on-site Project construction work within the scope of this Agreement as defined in Article 3; DPMC is referenced as "Owner"; the Mercer County and Vicinity Building and Construction Trades Council is referenced as the "County

Council"; and the work covered by this Agreement (as defined in Article 3) is referred to as the "Project."

SECTION 2: CONDITIONS FOR AGREEMENT TO BECOME EFFECTIVE

The Agreement shall not become effective unless executed by the County Council and the Owner and will remain in effect until the completion of the Project.

SECTION 3: ENTITIES BOUND & ADMINISTRATION OF AGREEMENT

This Agreement shall be binding on all signatory Unions and the Owner and all signatory Contractors performing on-site Project work, including site preparation and staging area, as defined in Article 3. The Contractors shall include in any subcontract that they let for performance during the term of this Agreement, a requirement that their subcontractors, of whatever tier, become signatory and bound by this Agreement with respect to subcontracted work performance within the scope of Article 3 and execute the Letter of Assent attached as Schedule B. This Agreement shall be administered by the Owner, on behalf of all Contractors.

SECTION 4: SUPREMACY CLAUSE

This Agreement, together with the local Collective Bargaining Agreements appended hereto as Schedule A, represents the complete understanding of all signatories and supersedes any national agreement, local agreement or other collective bargaining agreement of any type which would otherwise apply to this Project, in whole or in part except for all work performed under the NTD National Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, all instrument calibration work and loop checking shall be performed under the terms of the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians and the National Agreement of the International Union of Elevator Constructors, with the

exception of Article VII, IX, and X of this Project Agreement, which shall apply to such work. Where a subject covered by the provisions, explicit or implicit, of this Agreement is also covered by a Schedule A, the provisions of this Agreement shall prevail. It is further understood that neither the Owner nor any Contractor shall be required to sign any other agreement as a condition of performing work on this Project. No practice, understanding or agreement between a Contractor and a Local Union which is not explicitly set forth in this Agreement shall be binding on this Project unless endorsed in writing by the Owner.

SECTION 5: LIABILITY

The liability of any Contractor and the liability of any Union under this Agreement shall be several and not joint. The Owner and any Contractor shall not be liable for any violations of this Agreement by any other Contractor; and the County Council and Local Unions shall not be liable for any violations of this Agreement by another Union.

SECTION 6: THE OWNER

The Owner shall require in its bid specifications for all work within the scope of Article 3 that all successful bidders, and their subcontractors of whatever tier, become bound by, and signatory to, this Agreement. The Owner is not a party to and shall not be liable in any manner under this Agreement. It is understood that nothing in this Agreement shall be construed as limiting the sole discretion of the Owner in determining which Contractors shall be awarded contracts for Project work. It is further understood that the Owner has sole discretion at any time to terminate, delay or suspend the work, in whole or part, on this Project.

SECTION 7: AVAILABILITY AND APPLICABILITY TO ALL SUCCESSFUL BIDDERS

The Unions agree that this Agreement will be made available to, and will fully apply to any successful bidder to Project work who becomes signatory thereto, without regard to whether that successful bidder performs work at other sites on either a union or non- union basis and without regard to whether employees of such successful bidder are, or are not, members of any unions. This Agreement shall not apply to the work of any Contractor which is performed at any location other than the Project site, as defined in Article 3, Section 1.

ARTICLE 3 – SCOPE OF THE AGREEMENT

The Project work covered by this Agreement shall be as defined and limited by the following sections of this Article.

SECTION 1: THE WORK

This Agreement shall only apply to the on-site construction work, including site preparation, demolition and hazardous waste remediation, performed on the project defined as the "New Visitor Center, Washington State Park, Mercer County" (the "Project") during the time period of this Agreement as set forth in the bid documents covering Construction Contract P1222-00.

The scope of work is confined to the on-site Project work contained in the scope of the Owner's final construction contract.

SECTION 2: EXCLUDED EMPLOYEES

The following persons are not subject to the provisions of this Agreement, even though performing work on the Project:

a. Superintendents, supervisors (excluding general and forepersons specifically covered by a craft's Schedule A), engineers, inspectors and testers (excluding divers specifically covered by a craft's Schedule A), quality control/assurance personnel, timekeepers, mail carriers, clerks, office workers, messengers, guards, non-manual employees, and all professional, engineering, administrative and management persons;

b. Employees of the Owner or any other state agency, authority or entity or employees of any municipality or other public employer;

c. Employees and entities engaged in off-site manufacture, modifications, repair, maintenance, assembly, painting, handling or fabrication of project components, materials, equipment or machinery. However, employees and entities involved in off-site operations who are covered by the Prevailing Wage Act (for example, by being dedicated exclusively to the performance of the public work contract or building project and are adjacent to the site of work), or are involved in deliveries to and from the project site (except for local deliveries of all major construction materials including fill, ready mix concrete and cement, asphalt, and other items), shall be subject to this Agreement. Provided, however, local deliveries of ready mix, concrete, cement and asphalt shall not be contracted except to a subcontractor who pays wages and benefits not less than the economic equivalent of the wages and benefits set forth in Exhibit A.

d. Employees of the Contractor, excepting those performing manual, on-site construction labor who will be covered by this Agreement;

e. Employees engaged in on-site equipment warranty work;

f. Employees engaged in geophysical testing (whether land or water) other than boring for core samples;

g. Employees engaged in laboratory or specialty testing or inspections;

h. Employees engaged in ancillary Project work performed by third parties such as electric utilities, gas utilities, telephone companies and railroads.

SECTION 3. NON-APPLICATION TO CERTAIN ENTITIES

This Agreement shall not apply to the parents, affiliates, subsidiaries, or other joint or sole ventures of any Contractors that do not perform work at this Project. It is agreed, for the purposes of this Agreement only, that this Agreement does not have the effect of creating any joint employment, single employer or alter ego status among the Owner and/or any Contractor. The Agreement shall further not apply to the Owner or

any other state or county agency, authority, or other municipal or public entity and nothing contained herein shall be construed to prohibit or restrict the Owner or its employees or any other state authority, agency or entity and its employees from performing on or off-site work related to the Project. As the contracts which comprise the Project work are completed and accepted, the Agreement shall not have further force or effect on such items or areas except where inspections, additions, repairs, modifications, check-out and/or warranty work are assigned in writing (copy to Local Union involved) by the Owner or Contractor for performance under the terms of this Agreement.

ARTICLE 4 – UNION RECOGNITION AND EMPLOYMENT

SECTION 1. PRE-HIRE RECOGNITION

The Contractors recognize the signatory Unions as the sole and exclusive bargaining representatives of all craft employees who are performing on-site Project work within the scope of this Agreement as defined in Article 3.

SECTION 2. UNION REFERRAL

A. The Contractors agree to hire craft employees covered by this Agreement through the job referral systems and hiring halls (where the referrals meet the qualifications set forth in items 1, 2 and 4 of subparagraph B) established in the Local Unions' area collective bargaining agreements (attached as Schedule A to this Agreement). Notwithstanding this, the Contractors shall have sole rights to determine the competency of all referrals; the number of employees required (except with regard to pile driving and cranes); the selection of employees to be laid-off (except as

provided in Article 5, Section 3); and the sole right to reject any applicant referred by a Local Union, subject to the show-up payments required in the applicable Schedule A. In the event that a Local Union is unable to fill any request for qualified employees within a 48-hour period after such requisition is made by the Contractor (Saturdays, Sundays and holidays excepted), the Contractor may employ qualified applicants from any other available source. In the event that the Local Union does not have a job referral system, the Contractor shall give the Local Union first preference to refer applicants, subject to the other provisions of this Article. The Contractor shall notify the Local Union of craft employees hired within its jurisdiction from any source other than referral by the Union.

B. Following the employment of the first employee in each craft under Schedule A or the procedure set forth above in paragraph A, a Contractor may request by name, and the Local will honor, referral of persons who have applied to the Local for Project work and who meet the following qualifications as determined by a Committee of 3 designated, respectively, the applicable Local Union, the Owner, a mutually selected third party or, in the absence of agreement, the permanent arbitrator (or designee) designated in Article 7:

(1) possess any license required by New Jersey law for the Project work to be performed;

(2) have worked a total of at least 1000 hours in the Construction craft during the prior three years;

(3) were on the Contractor's active payroll for at least 60 out of the 180 calendar days prior to the contract award; and

(4) have demonstrated ability to safely perform the basic functions of the applicable trade.

Following the employment of the first employee in each craft under Schedule A, no more than 12 per centum of the employees covered by this Agreement, per Contractor by craft, shall be hired through the special provisions above (any fraction shall be rounded to the next highest whole number).

SECTION 3. NON-DISCRIMINATION IN REFERRALS

The Unions represent that their hiring halls and referral systems will be operated in a non-discriminatory manner and in full compliance with all applicable federal, state and local laws and regulations which require equal employment opportunities. Referrals shall not be affected in any way by the rules, regulations, bylaws, constitutional provisions or any other aspects or obligations of union membership, policies or requirements and shall be subject to such other conditions as are established in this Article. No employment applicant shall be discriminated against by any referral system or hiring hall because of the applicant's union membership, or lack thereof.

SECTION 4. MINORITY AND FEMALE REFERRALS

In the event a Union either fails, or is unable, to refer qualified minority or female applicants in percentages equaling Project affirmative action goals as set forth in the Owner's bid specifications, the Contractor may employ qualified minority or female applicants from any other available source as Apprentice Equivalents. Apprentice Equivalents will have completed a Department of Labor (DOL) approved training program, applied to take a construction Apprenticeship test, and will be paid at not less then the applicable equivalent Apprentice rate. With the approval of the Local

Administrative Committee (LAC), experience in construction related areas may be accepted as meeting the above requirements.

SECTION 5. CROSS AND QUALFIED REFERRALS

The Unions shall not knowingly refer to a Contractor an employee then employed by another Contractor working under this Agreement. The Local Unions will exert their utmost efforts to recruit sufficient numbers of skilled and qualified crafts employees to fulfill the requirements of the Contractor.

SECTION 6. UNION DUES / WORKING ASSESSMENTS

The union security provisions contained in the applicable Schedule A local agreements, shall not apply to the employees covered by this Agreement as for the period of time during which they are performing on-site Project work. No employee shall be discriminated against at the Project site because of the employee's union membership or lack thereof. In the case of unaffiliated employees who have voluntarily executed dues checkoff authorization cards provided in a Schedule A local agreement, the dues payment can be received by the Unions as a working assessment fee.

SECTION 7. CRAFT FOREPERSONS AND GENERAL FOREPERSONS

The selection of craft forepersons and/or general forepersons and the number of forepersons required shall be solely the responsibility of the Contractor except where otherwise provided by specific provisions of an applicable Schedule A. All forepersons shall take orders exclusively from the designated Contractor representatives. Craft forepersons shall be designated as working forepersons at the request of the Contractor, except when an existing local Collective Bargaining Agreement prohibits a foreperson from working when the craftpersons he is leading exceed a specified number.

ARTICLE 5 – UNION REPRESENTATION

SECTION 1. LOCAL UNION REPRESENTATIVE

Each Local Union representing on-site Project employees shall be entitled to designate in writing (copy to Contractor and Owner) one representative, including the Business Manager, who shall be afforded access to the Project.

SECTION 2. STEWARDS

(a) Each Local Union shall have the right to designate a working journeyperson as a Steward and an alternate, and shall notify the Contractor and Owner of the identity of the designated Steward (and alternate) prior to the assumption of such duties. Stewards shall not exercise supervisory functions and will receive the regular rate of pay for their craft classifications. There will be no non-working Stewards on the Project.

(b) In addition to his or her work as an employee, the Steward shall have the right to receive complaints or grievances and to discuss and assist in their adjustment with the Contractor's appropriate supervisor. Each Steward shall be concerned with the employees of the Steward's Contractor and, if applicable, subcontractors of that Contractor, but not with the employees of any other Contractor. The Contractor will not discriminate against the Steward in the proper performance of Union duties.

(c) The Stewards shall not have the right to determine when overtime shall be worked, or who shall work overtime except pursuant to a Schedule A provision providing procedures for the equitable distribution of overtime.

SECTION 3. LAYOFF OF A STEWARD

Contractors agree to notify the appropriate Union 24 hours prior to the layoff of a Steward, except in cases of discipline or discharge for just cause. If a Steward is protected against layoff by a Schedule A, such provisions shall be recognized to the extent the Steward possesses the necessary qualifications to perform the work required. In any case in which a Steward is discharged or disciplined for just cause, the Local Union involved shall be notified immediately by the Contractor.

ARTICLE 6 – MANAGEMENT'S RIGHTS

SECTION 1. RESERVATION OF RIGHTS

Except as expressly limited by a specific provision of this Agreement, Contractors retain full and exclusive authority for the management of their Project operations including, but not limited to: the right to direct the work force, including determination as to the number to be hired and the qualifications thereof; the promotion, transfer, layoff of its employees; or the discipline or discharge for just cause of its employees; the assignment and schedule of work; the promulgation of reasonable Project work rules; and the requirement, timing and number of employees to be utilized for overtime work. No rules, customs, or practices which limit or restrict productivity or efficiency of the individual, as determined by the Contractor or Owner, and/or joint working efforts with other employees shall be permitted or observed.

SECTION 2. MATERIALS, METHODS & EQUIPMENT

There shall be no limitations or restriction upon the Contractor's choice of materials, techniques, methods, technology or design, or, regardless of source or location, upon the use and installation of equipment, machinery, package units, pre-cast, pre-

fabricated, pre-finished, or pre-assembled materials, tool, or other labor-saving devices. Contractors may, without restriction, install or use materials, supplies or equipment regardless of their source. The on-site installation or application of such items shall be performed by the craft having jurisdiction over such work; provided, however, it is recognized that other personnel having special qualifications may participate, in a supervisory capacity, in the installation, check-out or testing of specialized or unusual equipment or facilities as designated by the Contractor. Notwithstanding the foregoing statement of Contractor rights, prefabrication issues relating to work traditionally performed at the job site shall be governed pursuant to the terms of the applicable Schedule A. There shall be no restrictions as to work, which is performed off-site for the Project, except for 1) offsite operations work covered under the New Jersey Prevailing Wage Act or 2) work done in a fabrication center, tool yard, or batch plant dedicated exclusively to the performance of work on the Project, and located adjacent to the "site of work".

ARTICLE 7 – WORK STOPPAGES AND LOCKOUTS

SECTION 1. NO STRIKES – NO LOCKOUTS

There shall be no strikes, sympathy strikes, picketing, work stoppages, slowdowns, hand billing, demonstrations or other disruptive activity at the Project for any reason by any Union or employee against any Contractor or employer while performing work at the Project. There shall be no other Union, or concerted or employee activity which disrupts or interferes with the free flow of traffic in the Project area. Failure of any Union or employee to cross any picket line established by any Union, signatory or non-signatory to this Agreement, or the picket or demonstration line of any other

organization, at or in proximity to the Project site is a violation of this Article. There shall be no lockout at the Project by any signatory Contractor. Contractors and Unions shall take all steps necessary to ensure compliance with this Section 1 and to ensure uninterrupted construction and the free flow of traffic in the Project area for the duration of this Agreement.

SECTION 2. DISCHARGE FOR VIOLATION

A Contractor may discharge any employee violating Section 1, above, and any such employee will not be eligible thereafter for referral under this Agreement for a period of 100 days.

SECTION 3. NOTIFICATION

If a Contractor contends that any Union has violated this Article, it will notify the appropriate district or area council of the Local Union involved advising of such fact, with copies of the notification to the Local Union and the County Council. The district or area council and the County Council shall each instruct, order and otherwise use their best efforts to cause the employees, and/or the Local Unions to immediately cease and desist from any violation of this Article. A district or area council, and/or the County Council complying with these obligations shall not be liable for the unauthorized acts of a Local Union or its members.

SECTION 4. EXPEDITED ARBITRATION

Any Contractor or Union alleging a violation of Section 1 of this Article may utilize the expedited procedure set forth below (in lieu, of, or in addition to, any actions at law or equity) that may be brought.

a. A party invoking this procedure shall notify J.J. Pierson, Jr., Esq., at 51 JFK Parkway, First Floor West, Short Hills, New Jersey 07078, telephone

number (973) 359-8161, who shall serve as Arbitrator under this expedited arbitration procedure. In the event that J.J. Pierson is unable to serve, a party invoking this procedure shall notify Gary Kendellen, who shall serve as Arbitrator under this expedited procedure. Copies of such notification will be simultaneously sent to the alleged violator and, if a Local Union is alleged to be in violation, it's International, the Owner, the County Council, and the Contractor.

b. The Arbitrator shall thereupon, after notice as to time and place to the Contractor, the Local Union involved, the County Council and the Owner, hold a hearing within 48 hours of receipt of the notice invoking the procedure if it is contended that the violation still exists. The hearing will not, however, be scheduled for less than 24 hours after the notice to the district or area council required by Section 3, above. Hearings shall be held at the jobsite or at the Newark office of the New Jersey State Board of Mediation, as directed by the Arbitrator.

c. All notices pursuant to this Article may be by telephone, email, telegraph, hand delivery, or fax, confirmed by overnight delivery, to the arbitrator, Contractor or Union involved. The hearing may be held on any day including Saturdays or Sundays. The hearing shall be completed in one session which shall not exceed eight hours duration (no more than four hours being allowed to either side to present their case, and conduct their cross-examination) unless otherwise agreed. A failure of any Union or Contractor to attend the hearing shall not delay the hearing of evidence by those present or the issuance of an award by the Arbitrator.

d. The sole issue at the hearing shall be whether a violation of Section 1, above, occurred. If a violation is found to have occurred, the Arbitrator shall issue a Cease and Desist Award restraining such violation and serve copies on the Contractor and Union involved. The Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages, which issue is reserved solely for court proceedings, if any. The Award shall be issued in writing within three hours after the close of the hearing, and may be issued without an opinion. If any involved party desires an opinion one shall be issued within 15 calendar days, but its issuance shall not delay compliance with, or enforcement of, the Award.

e. An award issued under this procedure may be enforced by any court of competent jurisdiction upon the filing of this Agreement together with the Award. Notice of the filing of such enforcement proceedings shall be given to the Union or Contractor involved. In any court proceeding to obtain a temporary or preliminary order enforcing the arbitrator's Award as issued under this expedited procedure, the involved Union and Contractor waive their right to a hearing and agree that such proceedings may be ex parte, provided notice is given to opposing counsel. Such agreement does not waive any party's right to participate in a hearing for a final court order of enforcement or in any contempt proceeding.

f. Any rights created by statute or law governing arbitration proceedings which are inconsistent with the procedure set forth in this Article, or

which interfere with compliance thereto, are hereby waived by the Contractors and Unions to whom they accrue.

g. The fees and expenses of the Arbitrator shall be equally divided between the involved Contractor and Union.

SECTION 5. ARBITRATION OF DISCHARGES FOR VIOLATION

Procedures contained in Article 9 shall not be applicable to any alleged violation of this Article, with the single exception that an employee discharged for violation of Section 1, above, may have recourse to the procedures of Article 9 to determine only if the employee did, in fact, violate the provisions of Section 1 of this Article; but not for the purpose of modifying the discipline imposed where a violation is found to have occurred.

ARTICLE 8 – LOCAL ADMINISTRATIVE COMMITTEE (LAC)

SECTION 1. MEETINGS

The Local Administrative Committee (LAC) will meet on a regular basis to 1) Implement and oversee the Agreement procedures and initiatives; 2) monitor the effectiveness of the Agreement; and 3) identify opportunities to improve efficiency and work execution.

SECTION 2. COMPOSITION

The LAC will be co-chaired by designees of the President of the County Council or his designee and the designated official of the Owner. It will be comprised of representatives of the Local Union's signatory to this Agreement, and representatives of the Owner and Contractors on this project.

ARTICLE 9 – GRIEVANCE & ARBIRTRATION PROCEDURE

SECTION 1. PROCEDURE FOR RESOLUTION OF GRIEVANCES

Any question, dispute or claim arising out of, or involving the interpretation of application of this Agreement (other than jurisdictional disputes or alleged violations of Article 7, Section 1) shall be considered a grievance and shall be resolved pursuant to the exclusive procedure of the steps described below; provided, in all cases, that the question, dispute or claim arose during the term of this Agreement.

STEP 1:

(a) When any employee covered by this Agreement feels aggrieved by a claimed violation of this Agreement, the employee shall, through the Local Union business representative or job steward, give notice of the claimed violation to the work site representative of the involved Contractor. To be timely, such notice of the grievance must be within 7 business days after the act, occurrence, or event, giving rise to the grievance or after the act, occurrence or event became known or should have become known to the Union. The business representative of the Local Union or the job steward and site representative of the involved Contractor shall meet and endeavor to adjust the matter within 3 business days after timely notice has been given. If they fail to resolve the matter within the prescribed period, the grieving party, may, within 7 calendar days thereafter, pursue Step 2 of the grievance procedure by serving the involved Contractor and the Owner with written copies of the grievance setting forth a description of the claimed violation, the date of which the grievance occurred, and the provisions of the

Agreement alleged to have been violated. Grievances and disputes settled at Step 1 are non-precedential except as to the specific Local Union, employee and Contractor directly involved unless the settlement is accepted in writing by the Contractor as creating a precedent.

(b) Should any signatory to this Agreement have a dispute (excepting jurisdictional disputes or alleged violations of Article 7, Section 1) with any other signatory to this Agreement and, if after conferring, a settlement is not reached within 9 business days, the dispute shall be reduced to writing and proceed to Step 2 in the same manner as outlined in subparagraph (a) for the adjustment of employee grievances.

STEP 2:

The Business Manager or designee of the involved Local Union, together with representatives of the County Council, the involved Contractor, and the Contractor shall meet in Step 2 within 5 calendar days of the written grievance to arrive at a satisfactory settlement.

STEP 3:

(a) If the grievance shall have been submitted but not resolved in Step 2, any of the participating Step 2 entities may within fourteen (14) calendar days after the initial Step 2 meeting, submit the grievance in writing (copies to other participants) to the next available arbitrator of the panel of arbitrators consisting of J.J. Pierson Jr., Esq., Gary Kendellen and Wellington Davis, who shall act as the Arbitrator under this expedited procedure. The Labor Arbitration Rules of the American Arbitration Association shall govern the conduct of the arbitration hearing, at which all Step 2 participants shall be parties. Hearings shall be held at

the jobsite or at the Newark office of the New Jersey State Board of Mediation, as directed by the Arbitrator. The decision of the Arbitrator shall be final and binding on the involved Contractor, Local Union and employees and the fees and expenses of such arbitrations shall be borne equally by the involved Contractor and Local Union.

(b) Failure of the grieving party to adhere to the time limits set forth in this Article shall render the grievance null and void. These time limits may be extended only by written consent of the involved Contractor and involved Local Union at the particular step where the extension is agreed upon. The Arbitrator shall have authority to make decisions only on the issues presented to him and shall not have the authority to change, add to, delete or modify any provision of this Agreement.

SECTION 2. LIMITATION AS TO RETROACTIVITY

No arbitration decision or award may provide retroactivity of any kind exceeding 30 calendar days prior to the date of service of the written grievance on the Owner and the involved Contractor or Local union.

SECTION 3. PARTICIPATION BY OWNER

The Owner and the President of the County Council shall be notified by the involved Contractor of all actions at Steps 2 and 3 and, at its election, the Owner may participate in full in all proceedings at these Steps, including Step 3 arbitration.

ARTICLE 10 – JURISDICTIONAL DISPUTES

SECTION 1. NO DISRUPTIONS

There will be no strikes, sympathy strikes, work stoppages, slowdowns, picketing or other disruptive activity of any kind arising out of any jurisdictional dispute. Pending the resolution of the dispute, the work shall continue uninterrupted and as assigned by the Contractor. No jurisdictional dispute shall excuse a violation of Article 7.

SECTION 2. ASSIGNMENT

A. There shall be a mandatory pre-job markup / assignment meeting prior to the commencement of any work. Attending such meeting shall be designated representatives of the Union signatories to this Agreement, the Owner, Contractor, and the involved Contractors. Best efforts will be made to schedule the pre-job meeting in a timely manner after the Notice to Proceed is issued but not later then 30 days prior to the start of the Project.

B. All Project construction work assignments shall be made by the Contractor according to the criteria set forth in Section 3, Subsection D 1-3.

C. When a Contractor has made an assignment of work, he shall continue the assignment without alteration unless otherwise directed by an arbitrator or there is agreement between the National or International Unions involved. Claims of a change of original assignment shall be processed in accordance with Article I of the Procedural Rules of the Plan for the Settlement of Jurisdictional Disputes in the Construction Industry (the "Plan").

D. In the event that a Union involved in the change of original assignment dispute is an affiliate of a National or International Union that is not affiliated with the Building

and Construction Trades Council AFL-CIO and does not wish to process a case through the Plan, the parties shall mutually select one of the following Arbitrators: Arbitrator J.J. Pierson, Arbitrator Richard Greenburg or Arbitrator Richard K. Hanft and submit the dispute directly to the Arbitrator. The selected Arbitrator shall determine whether the case requires a hearing or may be decided upon written submissions. In rendering his determination on whether there has been a change of original assignment, the Arbitrator shall be governed by the following:

1. The contractor who has the responsibility for the performance and installation shall make a specific assignment of the work which is included in his contract to a particular union(s). For instance, if contractor A subcontracts certain work to contractor B, then contractor B shall have the responsibility for making the specific assignments for the work included in his contract. If contractor B, in turn, shall subcontract certain work to contractor C, then contractor C shall have the responsibility for making the specific assignment for the work included in his contract. After work has been so assigned, such assignment will be maintained even though the assigning contractor is replaced and such work is subcontracted to another contractor. It is a violation of the Agreement for the Contractor to hold up disputed work or shut down a project because of a jurisdictional dispute.

2. When a contractor has made an assignment of work, he shall continue the assignment without alteration unless otherwise directed by an arbitrator or there is agreement between the National and International Unions involved.

a. Unloading and/or handling of materials to stockpile or storage by a trade for the convenience of the responsible contractor when his employees are not on the

job site, or in an emergency situation, shall not be considered to be an original assignment to that trade.

b. Starting of work by a trade without a specific assignment by an authorized representative of the responsible contractor shall not be considered an original assignment to that trade, provided that the responsible contractor, or his authorized representative, promptly, and, in any event, with eight working hours following the start of work, takes positive steps to stop further unauthorized performance of the work by that trade.

SECTION 3. PROCEDURE FOR SETTLEMENT OF DISPUTES

A. Any Union having a jurisdictional dispute with respect to Project work assigned to another Union will submit through its International the dispute in writing to the Administrator, Plan for the Settlement of Jurisdictional Disputes in the Construction Industry (the "Plan") within 72 hours and send a copy of the letter to the other Union involved, the Contractor involved, the Contractor, the County Council, and the district or area councils of the unions involved. Upon receipt of a dispute letter from any union, the Administrator will invoke the procedures set forth in the Plan to resolve the jurisdictional dispute. The jurisdictional dispute letter shall contain the information described in Article IV of the Procedural Rules of the Plan.

B. Within five calendar days of receipt of the dispute letter, there shall be a meeting of the Contractor, any other Contractor(s) or subcontractors involved, the Local Unions involved and designees of the County Council and the district or area councils of the Local Unions involved for the purpose of resolving the jurisdictional dispute.

C. In order to expedite the resolution of jurisdictional disputes, the parties have agreed in advance to mutually select one of the following designated Arbitrators:

Arbitrator J.J. Pierson, Arbitrator Richard Greenburg or Arbitrator Richard K. Hanft to hear all unresolved jurisdictional disputes arising under this Agreement. All other rules and procedures of the Plan shall be followed. If none of the three Arbitrators is available to hear the dispute within the time limits of the Plan, the Plan's arbitrator selection process shall be utilized to select another arbitrator.

D. In the event that a Union involved in the dispute is an affiliate of a National or International Union that is not affiliated with the Building and Construction Trades Council AFL-CIO and does not wish to process a case through the Plan as described in paragraphs A-C above, the parties to the dispute shall mutually select one of the following Arbitrators: Arbitrator J.J. Pierson, Arbitrator Richard Greenburgor Arbitrator Richard K. Hanft to hear the dispute and shall submit the dispute directly to the selected Arbitrator. The time limits for submission and processing disputes shall be the same as provided elsewhere in this Section. The selected Arbitrator shall schedule the hearing within seven business days from the date of submission. If he cannot hear the case within the required timeframe, one of the other Arbitrators will be selected to hear the case unless all parties to the dispute agree to waive the seven day time limit. In rendering his decision, the Arbitrator shall determine:

1. First whether a previous agreement of record or applicable agreement, including a disclaimer agreement, between the National and International Unions to the dispute governs;

2. Only if the Arbitrator finds that the dispute is not covered by an appropriate or applicable agreement of record or agreement between the crafts to the dispute, he shall then consider the established trade practice in the industry and prevailing practice in the locality. Where there is a previous decision of record

governing the case, the Arbitrator shall give equal weight to such decision of record governing the case, unless the prevailing practice in the locality in the past ten years favors one craft. In that case, the Arbitrator shall base his decision on the practice in the locality. Except, that if the Arbitrator finds that a craft has improperly obtained the prevailing practice in the locality through raiding, the undercutting of wages or by the use of vertical agreements, the Arbitrator shall rely on the decision of record and established trade practice in the industry rather than the prevailing practice in the locality.

3. Only if none of the above criteria is found to exist, the Arbitrator shall then consider that because efficiency, cost or continuity and good management are essential to the well-being of the industry, the interests of the consumer or the practices of the employer shall not be ignored.

The Arbitrator shall set forth the basis for his decision and shall explain his findings regarding the applicability of the above criteria. If lower-ranked criteria are relied upon, the Arbitrator shall explain why the higher-ranked criteria were not deemed applicable. The Arbitrator's decision shall only apply to the job in dispute.

Each party to the arbitration shall bear its own expense for the arbitration and agrees that the fees and expenses of the Arbitrator shall be borne by the losing party or parties as determined by the Arbitrator.

E. The Arbitrator will render a short-form decision within five (5) days of the hearing based upon the evidence submitted at the hearing, with a written decision to follow within 30 days of the close of hearing.

F. This Jurisdictional Dispute Resolution Procedure will only apply to work performed by Local Unions on the Project.

G. Any Local Union involved in a jurisdictional dispute on this Project shall continue working in accordance with Section 2 above and without disruption of any kind.

SECTION 4. AWARD

Any award rendered pursuant to this Article shall be final and binding on the disputing Local Unions and the involved Contractor on this Project only, and may be enforced in accordance with the provisions of Article VII of the Plan. Any award rendered pursuant to the alternate procedures of this Article shall be final and binding on the disputing Local Unions and the involved Contractor on this Project only, and may be enforced in any court of competent jurisdiction. Such award or resolution shall not establish a precedent on any other construction work not covered by this Agreement. In all disputes under this Article, the Contractor and the involved Contractors shall be considered parties in interest.

SECTION 5. LIMITATIONS

The Arbitrator shall have no authority to assign work to a double crew, that is, to more employees than the minimum required by the Contractor to perform the work involved; nor to assign the work to employees who are not qualified to perform the work involved; nor to assign work being performed by non-union employees to union employees. This does not prohibit the establishment, with the agreement of the involved Contractor, of composite crews where more than one employee is needed for the job. The aforesaid determinations shall decide only to whom the disputed work belongs.

SECTION 6. NO INTERFERENCE WITH WORK

A. There shall be no interference or interruption of any kind with the work of the Project while any jurisdictional dispute is being resolved. The work shall proceed as

assigned by the Contractor until finally resolved under the applicable procedure of this Article. The award shall be confirmed in writing to the involved parties. There shall be no strike, work stoppage or interruption in protest of any such award. Any claims of a violation of this section shall be submitted and processed in accordance with the impediment to job progress provisions of the Plan.

B. In the event a Union alleged to have engaged in an impediment to job progress is an affiliate of a National or International Union that is not affiliated with the Building and Construction Trades Council AFL-CIO and does not wish to have the impediment to job progress charge processed through the Plan, the parties to the dispute shall mutually select one of the three Arbitrators designated in this Article to hear the dispute. The selected Arbitrator shall schedule the hearing within two business days from the date of submission. If he cannot hear the case within the required timeframe, one of the other Arbitrators shall be selected by the parties to hear the case unless all parties to the dispute agree to waive the two-day time limit. The sole issue at the hearing shall be whether or not a violation of this Section has in fact occurred, and the Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages. The Arbitrator's decision shall be issued in writing within 3 hours after the close of the hearing, and may be issued without an opinion. If any party desires an opinion, one shall be issued within 15 days, but its issuance shall not delay compliance with, or enforcement of, the decision. The Arbitrator may order cessation of the violation of this Section and other appropriate relief, and such decision shall be served on all parties by facsimile upon issuance. Each party to the arbitration shall bear its own expense for the arbitration and agrees that the fees and expenses of the Arbitrator shall be borne by the losing party or parties as determined by the Arbitrator.

ARTICLE 11 – WAGES AND BENEFITS

SECTION 1. CLASSIFICATION AND BASE HOURLY RATE

All employees covered by this Agreement shall be classified in accordance with the work performed and paid the base hourly wage rates for those classifications as specified in the attached Schedules A, as amended during this Agreement. Recognizing, however, that special conditions may exist or occur on the Project, the parties, by mutual agreement may establish rates and/or hours for one or more classifications which may differ from Schedule A. Parties to such agreements shall be the Owner, Contractor, the contractor/subcontractor involved, the involved Local Unions and the County Council.

SECTION 2. EMPLOYEE BENEFIT FUNDS

A. The Contractor agrees to pay contributions to the established funds in the amounts designated in Schedule A. Bona fide jointly trusteed fringe benefit plans established or negotiated through collective bargaining during the life of this Agreement may be added.

B. The Contractor agrees to be bound by the written terms of the legally established Trust Agreements specifying the detailed basis on which payments are to be paid into, and benefits paid out of, such Trust Funds but only with regard to work done on this Project and only for those employees to whom this Agreement requires such benefits Payments.

C. Should any contractor or subcontractor become delinquent in the payment of contributions to the fringe benefit funds, then the subcontractor at the next higher tier, or upon notice of the delinquency claim from the Union or the Trust Funds, agrees to

withhold from the subcontractor such disputed amount from the next advance, or installment payment for work performed and the amount claimed and owed will be paid within thirty (30) days after receipt of the notification by the General Contractor, if not paid prior to said date by the delinquent contractor/subcontractor.

ARTICLE 12 – HOURS OF WORK, PREMIUM PAYMENTS, SHIFTS AND HOLIDAYS

SECTION 1. WORK WEEK AND WORK DAY

A. The standard work week shall consist of 40 hours of work at straight time rates per the following schedule:

(1) Five-Day Work Week: Monday – Friday; five days, eight hours plus ½ hour unpaid lunch period per day.

(2) Four-Day Work Week: Monday – Thursday; four days ten hours plus ½ hour unpaid lunch period per day.

B. The Day Shift shall commence between the hours of 6:00 a.m. and 9:00 a.m. and shall end between the hours of 2:30 p.m. and 5:30 p.m. Starting and quitting times shall occur at the employees' place of work as may be designated by the Contractor in accordance with area practice.

C. Notice – the Contractor shall provide not less than five days prior notice to the Local Union involved as to the work hour schedules to be worked or such lesser notice as may be mutually agreed upon.

SECTION 2. OVERTIME

Overtime pay for hours outside of the standard work week and work day, described in paragraph A above, shall be paid in accordance with the applicable Schedule A. There will be no restriction upon the Contractor's scheduling of overtime or the non-

discriminatory designation of employees who shall be worked. There shall be no pyramiding of overtime pay under any circumstances. The Contractor shall have the right to schedule work so as to minimize overtime.

SECTION 3. SHIFTS

A. Flexible Schedules – Scheduling of shift work shall remain flexible in order to meet Project schedules and existing Project conditions including the minimization of interference with traffic. It is not necessary to work a day shift in order to schedule a second shift. Shifts must be worked a minimum of five consecutive work days, must have prior approval of the Owner, and must be scheduled with not less than five work days notice to the Local Union.

B. Second Shift – The second shift (starting between 2 p.m. and 8 p.m.) shall consist of eight hours work (or ten hours of work) for and equal number of hours pay at the straight time rate plus 15% in lieu of overtime and exclusive of a ½ hour unpaid lunch period.

C. Flexible Starting Times – Shift starting times will be adjusted by the Contractor as necessary to fulfill Project requirements subject to the notice requirements of paragraph A.

D. It is agreed that when project circumstances require a deviation from the above shifts, the involved unions, contractors and the Owner shall adjust the starting times of the above shifts or establish shifts which meet the project requirements. It is agreed that neither party will unreasonably withhold their agreement.

SECTION 4. HOLIDAYS

A. Schedule - There shall be 8 recognized holidays on the Project:

New Years Day Labor Day

Presidents Day	Veterans Day
Memorial Day	Thanksgiving Day
Fourth of July	Christmas Day

*Work shall be scheduled on Good Friday pursuant to the craft's Schedule A.

All said holidays shall be observed on the dates designated by New Jersey State Law. In the absence of such designations, they shall be observed on the calendar date except those holidays which occur on Sunday shall be observed on the following Monday. Holidays falling on Saturday are to be observed on the preceding Friday.

B. Payment - Regular holiday pay, if any, and/or premium pay for work performed on such a recognized holiday shall be in accordance with the applicable Schedule A.

C. Exclusivity - No holidays other than those listed in Section 4-A above shall be recognized nor observed except in Presidential Election years when Election Day is a recognized holiday. Columbus Day and the Friday after Thanksgiving shall be observed as a holiday for Elevator Constructors Local 1 only.

SECTION 5. REPORTING PAY

A. Employees who report to the work location pursuant to regular schedule and who are not provided with work or whose work is terminated early by a Contractor, for whatever reason, shall receive minimum reporting pay in accordance with the applicable Schedule A.

B. When an employee who has completed his/her scheduled shift and left the Project site is "called out" to perform special work of a casual, incidental or irregular nature, the employee shall receive pay for actual hours worked with a minimum guarantee, as may be required by the applicable Schedule A.

C. When an employee leaves the job or work location of his/her own volition or is discharged for a cause or is not working as a result of the Contractor's invocation of Section 7 below, he/she shall be paid only for he actual time worked.

D. Except as specifically set forth in this Article, there shall be no premiums, bonuses, hazardous duty, high time or other special payments of any kind.

E. There shall be no pay for time not actually worked except as specifically set forth in this Article or except where specifically provided in applicable Schedule A.

SECTION 6. PAYMENT OF WAGES

A. Payday- Payment shall be made by check, drawn on a New Jersey bank with branches located within commuting distance of the job site. Paychecks shall be issued by the Contractor at the job site by 10 a.m. on Thursdays. Not more than 3 day's wages shall be held back in any pay period. Paycheck stubs shall contain the name and business address of the Contractor, together with an itemization of deductions from gross wages.

B. Termination – Employees who are laid off or discharged for cause shall be paid in full for that which is due them at the time of termination. The Contractor shall also provide the employee with a written statement setting forth the date of layoff or discharge.

SECTION 7. EMERGENCY WORK SUSPENSION

The Contractor may, if considered necessary for the protection of life and/or safety of employees or others, suspend all or a portion of Project Work. In such instances, employees will be paid for actual time worked; provided, however, that when the Contractor requests that employees remain at the job site available for work, employees will be paid for "stand-by" time at their hourly rate of pay.

SECTION 8. INJURY/DISABILITY

An employee, who, after commencing work, suffers a work-related injury or disability while performing work duties, shall receive no less than eight hours wages for

that day. Further, the employee shall be rehired at such time as able to return to duties provided there is still work available on the Project for which the employee is qualified and able to perform.

SECTION 9. TIME KEEPING

A Contractor may utilize brassing or other systems to check employees in and out. Each employee must check in and out. The Contractor will provide adequate facilities for checking in and out in an expeditious manner.

SECTION 10. MEAL PERIOD

The Contractor shall schedule an unpaid period of not more than ½ hour duration at the work location between the 3rd and 5th hour of the scheduled shift. A Contractor may, for efficiency of operations, establish a schedule that coordinates the meal periods of two or more crafts. If an employee is required to work through the meal period, the employee shall be compensated in a manner established in the applicable Schedule A.

SECTION 11. BREAK PERIODS

Local area practice will prevail for coffee breaks.

ARTICLE 13 - APPRENTICES

SECTION 1. RATIOS

Recognizing the need to maintain continuing supportive programs designed to develop adequate numbers of competent workers in the construction industry and to provide craft entry opportunities for minorities, women and economically disadvantaged non-minority males, the Contractor will employ apprentices in their respective crafts to perform such work as is within their capabilities and which is customarily performed by the craft in which they are indentured. The Contractor may utilize apprentices and such

other appropriate classifications as are contained in the applicable Schedule A in a ratio not to exceed 25% of the work force by craft (without regard to whether a lesser ratio is set forth is Schedule A), unless the applicable Schedule A provide for a higher percentage. Apprentices and such other classifications as are appropriate shall be employed in a manner consistent with the provision of the appropriate Schedule A.

SECTION 2. DEPARTMENT OF LABOR

To assist the Contractors in attaining a maximum effort on this Project, the Unions agree to work in close cooperation with, and accept monitoring by, the New Jersey State and federal Departments of Labor to ensure minorities, women, or economically disadvantaged are afforded opportunities to participate in apprenticeship programs that result in the placement of apprentices on this Project. To further ensure that this Contractor effort is attained, up to 50% of the apprentices placed on this Project should be first year, minority, women or economically disadvantaged apprentices. The Local Unions will cooperate with Contractor requests for minority, women or economically disadvantaged referrals to meet this Contractor effort.

ARTICLE 14 – SAFETY PROTECTION OF PERSON AND PROPERTY

SECTION 1. SAFETY REQUIREMENTS

The Contractor will ensure that applicable OSHA requirements and other requirements set forth in the contract documents are at all times maintained on the Project and the employees and Unions agree to cooperate fully with these efforts. Employees must perform their work at all times in a safe manner and protect themselves and the property of the Contractor and the Owner from injury or harm. Failure to do so will be grounds for discipline, including discharge.

SECTION 2. CONTRACTOR RULES

Employees covered by this Agreement shall at all times be bound by the reasonable safety, security, and visitor rules as established by the Contractor and the Owner for this Project. Such rules will be published and posted in conspicuous places throughout the Project.

SECTION 3. INSPECTIONS

The Contractor and Owner retain the right to inspect incoming shipments of equipment, apparatus, machinery and construction materials of every kind.

ARTICLE 15 – NO DISCRIMINATION

SECTION 1. COOPERATIVE EFFORTS

The Contractor and Unions agree that they will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin or age in any manner prohibited by law or regulation. It is recognized that special procedures may be established by the Contractor and Local Unions and the New Jersey State Department of Labor and Workforce Development for the training and employment of persons who have not previously qualified to be employed on construction projects of the type covered by this Agreement. The parties to this Agreement will assist in such programs and agree to use their best efforts to ensure that the goals for female and minority employment are met on this Project.

SECTION 2. LANGUAGE OF AGREEMENT

The use of the masculine or feminine gender in this Agreement shall be construed as including both genders.

ARTICLE 16 – GENERAL TERMS

SECTION 1. PROJECT RULES

The Owner and Contractor shall establish such reasonable Project rules as are appropriate for the good order of the Project provided they do not violate the terms of this Agreement. These rules will be explained at the pre-job conference and posted at the Project site and may be amended thereafter as necessary. Failure of an employee to observe these rules and regulations shall be grounds for discipline, including discharge. The fact that no order was posted prohibiting a certain type of misconduct shall not be a defense to an employee disciplined or discharge for such misconduct when the action taken is for cause.

SECTION 2. TOOLS OF THE TRADE

The welding/cutting torch and chain fall are tools of the trade having jurisdiction over the work performed. Employees using these tools shall perform any of the work of the trade. There shall be no restrictions on the emergency use of any tools or equipment by any qualified employee or on the use of any tools or equipment for the performance of work within the employee's jurisdiction.

SECTION 3. SUPERVISION

Employees shall work under the supervision of the craft foreperson or general foreperson.

SECTION 4. TRAVEL ALLOWANCES

There shall be no payments for travel expenses, travel time, subsistence allowance or other such reimbursements or special pay except as expressly set forth in this Agreement.

SECTION 5. FULL WORK DAY

Employees shall be at their staging area at the starting time established by the Contractor and shall be returned to their staging area by quitting time after performing their assigned functions under the supervision of the Contractor. The signatories reaffirm their policy of a fair day's work for a fair day's wage.

SECTION 6. COOPERATION

The Owner and the Unions will cooperate in seeking any NJ Department of Labor and Workforce Development approvals that may be required for implementation of any terms of this Agreement.

ARTICLE 17 – SAVINGS AND SEPARABILITY

SECTION 1. THIS AGREEMENT

In the event that the application of any provision of this Agreement is enjoined, on either an interlocutory or permanent basis, or otherwise found in violation of law, the provision involved shall be rendered, temporarily or permanently, null and void but the remainder of the Agreement shall remain in full force and effect. In such event, the Agreement shall remain in effect for contracts already bid and awarded or in construction where the Contractor voluntarily accepts the Agreement. The parties to this Agreement will enter into negotiations for a substitute provision in conformity with the law and the intent of the parties for contracts to be let in the future.

SECTION 2. THE BID SPECIFICATIONS

In the event that the bid specifications, or other action, requiring that a successful bidder become signatory to this Agreement is enjoined, on either an interlocutory or

permanent basis, or otherwise found in violation of law, such requirement shall be rendered, temporarily or permanently, null and void but the Agreement shall remain in full force and effect to the extent allowed by law. In such event, the Agreement shall remain in effect for contracts already bid and awarded or in construction where the Contractor voluntarily accepts the Agreement. The parties will enter into negotiations as to modifications to the Agreement to reflect the court action taken and the intent of the parties for contracts to be let in the future.

SECTION 3. NON-LIABILITY

In the event of an occurrence referenced in Section 1 or Section 2 of this Article, neither the Owner, the Contractor, nor any signatory Union shall be liable, directly or indirectly, for any action taken, or not taken, to comply with any court order, injunction or determination. Project bid specifications will be issued in conformance with court orders then in effect and no retroactive payments or other action will be required if the original court determination is ultimately reversed.

SECTION 4. NON-WAIVER

Nothing in this Article shall be construed as waiving the prohibitions of Article 7 as to signatory Contractors and signatory Unions.

ARTICLE 18 – FUTURE CHANGES IN SCHEDULE A AREA CONTRACTS

SECTION 1. CHANGES TO AREA CONTRACTS

A. Schedule A to this Agreement shall continue in full force and effect until the Contractor and/or Union parties to the Area Collective Bargaining Agreements which are the basis for Schedule A notify the Contractor in writing of the mutually agreed upon

changes in provision of such agreements which are applicable to the Project, and their effective dates.

B. It is agreed that any provisions negotiated into Schedule A collective bargaining agreements will not apply to work on this Project if such provisions are less favorable to this Project than those uniformly required of contractors for construction work normally covered by those agreements; nor shall any provision be recognized or applied on this Project if it may be construed to apply exclusively, or predominantly, to work covered by this Project Agreement.

C. Any disagreement between signatories to this Agreement over the incorporation into Schedule "A" of provisions agreed upon in the renegotiation of Area Collective Bargaining Agreements shall be resolved in accordance with the procedure set forth in Article 9 of this Agreement.

SECTION 2. LABOR DISPUTES DURING AREA CONTRACT NEGOTIATIONS

The Unions agree that there will be no strikes, work stoppages, sympathy actions, picketing, slowdowns or other disruptive activity or other violations of Article 7 affecting the Project by any Local Union involved in the renegotiation of Area Local Collective Bargaining Agreements nor shall there be any lockout on this Project affecting a Local Union during the course of such renegotiations. The Contractor agrees that all payments due under any renegotiated area Local Collective Bargaining Agreement shall be made retroactive to the effective date thereof.

ARTICLE 19 – HELMETS TO HARDHATS

The Contractor and the Unions recognize a desire to facilitate the entry into the building and construction trades of veterans who are interested in careers in the building

and construction industry. The Contractor and Unions agree to utilize the services of the Center for Military Recruitment, Assessment and Veterans Employment (hereinafter "Center") and the Center's "Helmets to Hardhats" program to serve as a resource for preliminary orientation, assessment of construction aptitude, referral to apprenticeship programs or hiring halls, counseling and mentoring, support network, employment opportunities and other needs as identified by the parties.

The Unions and Contractor agree to coordinate with the Center to create and maintain an integrated database of veterans interested in working on the Project and of apprenticeship and employment opportunities for the Project. To the extent permitted by law, the Unions will give credit to such veterans for bona fide, provable past experience.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and effective as of the _____ day of _____, 2024.

FOR THE DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION

By: _____
Richard Flodmand, Deputy Director

FOR THE BUILDING AND CONSTRUCTION TRADES MERCER COUNTY AND VICINITY BUILDING AND CONSTRUCTION TRADES COUNCIL

By: _____
Wayne DeAngelo, President

FOR LOCAL UNION AFFILIATES:

ASBESTOS WORKERS, LOCAL

By: _____
(Name/Title)

BRICKLAYERS AND ALLIED CRAFTS, LOCAL

By: _____
(Name/Title)

CARPENTERS, LOCAL

By: _____
(Name/Title)

CARPENTERS, LOCAL

By: _____
(Name/Title)

DOCKBUILDERS AND PILE DRIVERS, LOCAL

By: _____
(Name/Title)

INT. BROTHERHOOD OF ELECTRICAL WORKERS, LOCAL

By: _____
(Name/Title)

ELEVATOR CONSTRUCTORS, LOCAL

By: _____
(Name/Title)

IRONWORKERS, LOCAL

By: _____
(Name/Title)

LABORERS, LOCAL

By: _____
(Name/Title)

HEAVY CONSTRUCTION LABORERS, LOCAL

By: _____
(Name/Title)

MILLWRIGHTS, LOCAL

By: _____
(Name/Title)

OPERATING ENGINEERS, LOCAL

By: _____
(Name/Title)

OPERATIVE PLASTERS & CEMENT MASONS, LOCAL

By: _____
(Name/Title)

PAINTERS AND ALLIED TRADES, LOCAL

By: _____
(Name/Title)

PIPEFITTERS, LOCAL

By: _____
(Name/Title)

PLUMBERS, LOCAL

By: _____
(Name/Title)

ROOFERS AND WATERPROOFERS, LOCAL

By: _____
(Name/Title)

SHEETMETAL WORKERS, LOCAL

By: _____
(Name/Title)

SPRINKLEFITTERS, LOCAL

By: _____
(Name/Title

TEAMSTERS, LOCAL

By: _____
(Name/Title)

TILE/MARBLE/TERRAZZO WORKERS, LOCAL

By: _____
(Name/Title)

END

SCHEDULE A

A COPY OF EACH UNION'S CURRENT COLLECTIVE BARGAINIG AGREEMENT IS INCLUDED AS PART OF SCHEDULE A BY REFERENCE, UPON EXECUTION BY THE SIGNATORY LOCAL.

Asbestos Workers, Local 89

Boilermaker, Local 28

Bricklayers and Allied Crafts, Locals 4 & 5

Carpenters, Local 251 (Flooring)

Carpenters, Locals 254 & 255

Dockbuilders, Pile Drivers & Timbermen, Local 1556

Dockbuilders, Pile Drivers & Timbermen, Local 441

Electrical Workers, Local 269

Elevator Constructors, Local 5

Heavy Construction Laborers, Local 172

Ironworkers, Local 399

Laborers, Locals 77 & 78

Millwrights, Local 715

Operating Engineers, Local 825

Operative Plasters & Cement Masons, Local 592

Painters and Allied Trades, District Council 711

Plumbers and Pipefitters, Local 9

Plasterers & Cement Masons, Local 592

Plumbers, Local

Roofers, Local 30

Sheet Metal Workers, Locals 19 & 27

Sprinklerfitters, Locals 692 & 669

Teamsters, Local 469

Tile/Marble/Terrazzo Workers, Local 7

PROJECT LABOR AGREEMENT

COVERING NEW VISITOR CENTER,
WASHINGTON CROSSING STATE PARK, MERCER COUNTY
DPMC PROJECT P1222-00

TELE-DATA ADDENDUM

The parties hereby agree that all Tele-data work and associated electrical work performed on any of the sites during construction shall be done by employees represented by the signatory unions. For the purpose of this Agreement, Tele-data work shall include, but not limited to, the following: All receiving, placement, installation, operation, testing, inspection, maintenance, repair and service of radio, television, video, data, voice, sound, emergency call, microwave and visual production and reproduction apparatus, equipment and appliances used for domestic, commercial, education and entertainment purposes; all installation and erection of equipment, apparatus or appliance, cables and/or wire, emergency power (batteries) and all directly related work which becomes an integral part of the telecommunication and/or telecommunications related systems repair and service maintenance work of telecommunications systems and devices including, but not limited to, Private Branch Exchanges (PBX-PABX), Key equipment-owned, CCTV, CATV, card access, Systems RS 232 ethernet and/or any local area network system associated with computer installation.

_____ **SIGNATORY UNIONS**

BY:_____ BY:_____

PROJECT LABOR AGREEMENT

COVERING NEW VISITOR CENTER,
WASHINGTON CROSSING STATE PARK, MERCER COUNTY
DPMC PROJECT P1222-00

SHEET METAL ADDENDUM

(General Contractor) (Project Management Firm) agrees that when subcontracting for prefabrication of H.V.A.C. duct and other related sheet metal, such prefabrication shall be subcontracted to fabricators who pay their employees engaged in such fabrication not less than the prevailing wage for comparable sheet metal fabrication as established under agreements between local affiliates of Sheet Metal Workers' International Association and local sheet metal fabricators.

(General Contractor) (Project Management Firm) and the Sheet Metal Workers' International Association agree to work with fabrication shops referenced in the Addendum. This joint effort will be directed at improving fabricators' competitiveness through the application of continuous improvement principles.

(General Contractor) (Project Management Firm)	Sheet Metal Workers' International Assoc. Local #25

PROJECT LABOR AGREEMENT

COVERING NEW VISITOR CENTER,
WASHINGTON CROSSING STATE PARK, MERCER COUNTY
DPMC PROJECT P1222-00

LETTER OF ASSENT

Re: Project Labor Agreement
Mercer County and Vicinity Building & Trades Council, AFL-CIO and the State of New Jersey, Department of the Treasury, Division of Property Management and Construction (the "Agreement")

The undersigned, as a Contractor, or a Subcontractor on a Contract which is part of large construction project for the State of New Jersey, for and in consideration of the award of a Contract to perform work on said Project, and in further consideration of the mutual promises made in the Project Labor Agreement, a copy of which was received and is acknowledged, hereby:

(1) On behalf of itself and all its employees, accepts and agrees to be bound by the terms and conditions of the Project Labor Agreement, together with any and all amendments and supplements now existing or which are later made thereto, and understands that any act of non-compliance with all such terms and conditions will subject the non-complying Contractor or employee(s) to being prohibited from the Project Site until full compliance is obtained.

(2) Certifies that it has no commitments or agreements that would preclude its full compliance with the terms and conditions of said Projects Labor Agreement.

(3) Agrees to secure from any Contractor(s) (as defined in said Project Labor Agreement) which is or becomes a Subcontractor(s) (of any tier), a duly executed Letter of Assent in form identical to this document prior to commencement of any work.

_____
Company Name

By: _____ Contract Number __P1222-00__

Title: _____ Contractor_____

Date: _____

cc: (Unions employed by Contractor)

STATEMENT OF ASSURANCES

ADDITIONAL FEDERALLY FUNDED AGREEMENT PROVISIONS APPLICABLE TO CARES ACT AND AMERICAN RESCUE PLAN ACT FUNDED PROJECTS

The purpose of this Statement of Assurances is to list requirements applicable to programs funded in whole or in part by the Coronavirus Relief Fund (Fund), established by the Coronavirus Aid, Relief, and Economic Security (CARES) Act, and/or by Coronavirus State and Local Fiscal Recovery Funds (SLFRF), established by the American Rescue Plan Act of 2021 (ARPA). Not all of the requirements listed herein shall apply to all activities or work under the Contract.

As used herein, **"Contractor"** and **"Consultant"** refer to any contractors or consultants awarded a Contract to provide goods or perform services in connection with the Project and paid with monies under the SLFRF or Fund.

Contractor/Consultant agrees to comply with all *applicable* federal laws, guidelines and standards in a manner satisfactory to the State and the U.S. Treasury Department, including all administration and compliance requirements set forth by this Statement of Assurances. To the extent that Contractor/Consultant utilizes any subconsultants/subcontractors, Contractor/Consultant shall require and ensure that each subconsultant/subcontractor complies with all *applicable* federal laws, guidelines and standards; any subcontracts entered into by Contractor/Consultant shall set forth these requirements.

The failure to list herein a legal requirement applicable to services performed by Contractor/Consultant does not relieve the Contractor/Consultant from complying with that requirement.

A. GENERAL PROVISIONS

1. Under provisions of the Hatch Act that limit the political activity of employees, Fund and/or SLFRF funds shall not be used to finance the use of facilities or equipment for political purposes or to engage in other partisan political activities, such as candidate forums, voter transportation, or voter registration. However, a facility originally assisted with CARES and/or ARPA funds may be used on an incidental basis to hold political meetings, candidate forums, or voter registration campaigns, provided all parties and organizations have access to the facility on an equal basis, and are assessed equal rent or use charges, if any.

2. Under provisions of the Byrd Anti-Lobbying Amendment, 31 U.S.C. 1352, Contractors/Consultants that apply or bid for an award exceeding $100,000 must file the required certification, Attachment A hereto. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal

funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

3. No federally appointed funds shall be used for lobbying purposes regardless of level of government, in accordance with 2 CFR 200.450 and 31 CFR Part 21.

4. Contractors/Consultants that apply or bid for an award exceeding $100,000 must comply with the drug-free workplace requirements of the Drug-Free Workplace Act of 1988 and 31 CFR Part 20.

B. **PERSONALLY IDENTIFIABLE INFORMATION:** To the extent the Contractor/Consultant receives personally identifiable information, it will comply with the Privacy Act of 1974 and applicable rules and regulations related to the protection of personally identifiable information. The term "personally identifiable information" refers to information which can be used to distinguish or trace an individual's identity, such as their name, social security number, biometric records, etc., either alone or when combined with other personal or identifying information which is linked or linkable to a specific individual, such as date and place of birth, mother's maiden name, etc. See 2 CFR 200.79 & OMB M-07-16. Contractor/Consultant shall require all persons that have access to personally identifiable information (including subcontractors/subconsultants and their employees) to sign a Non-Disclosure Agreement.

C. FINANCIAL MANAGEMENT AND PROCUREMENT

1. *To the extent applicable*, Contractor/Consultant shall adhere to the principles and standards as set forth in the OMB Uniform Administrative Requirements, Cost Principles and Audit Requirements for Federal Awards (2 CFR Part 200).

2. Debarment and Suspension: Contractor/Consultant shall comply with all *applicable* laws pertaining to financial management, including 2 CFR Part 180 and 31 CFR Part 19 which prohibit the making of any contract award or permitting any award (sub grant or contract) at any tier to any party that is debarred or suspended or is otherwise excluded from or ineligible for participation in federal assistance programs. To the extent that it uses subcontractors or subconsultants, Contractor/Consultant must verify that none of them are on the List of Parties Excluded from Federal Procurement or Non-procurement Programs in the government-wide System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR Part 180 that implement Executive Orders 12549 and 12689, "Debarment and Suspension," as set forth at 2 CFR Part 2424. No Contractors, Consultants, or Subcontractors that are on the List may receive any Fund or SLFRF funds.

3. Conflict of interest rules, as set forth in Section 4019 of the CARES Act and 2 CFR § 200.318(c)(2) apply. Contractor/Consultant shall disclose in writing any potential conflict of interest to DPMC and shall complete the required certification, Attachment B hereto.

4. *To the extent applicable*, Contractor/Consultant shall comply with the procurement standards in the Uniform Guidance at 2 CFR § 200.317 through § 200.327.

5. Procurement of Recovered Materials: Contractor/Consultant must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include: (1) procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; (2) procuring solid waste management services in a manner that maximizes energy and resource recovery; and (3) establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

6. Domestic Preferences for Procurement: (a) As appropriate and to the extent consistent with law, Contractor/Consultant should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all subcontracts and purchase orders for work or products under this award.

   (b) For purposes of this section:

   (1) ‘‘Produced in the United States’’ means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

   (2) ‘‘Manufactured products’’ means items and construction materials composed in whole or in part of nonferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

7. Requirements regarding notification to employees of whistleblower protections in accordance with 41 U.S.C. § 4712 apply.

8. *To the extent applicable*, Contractor/Consultant shall comply with the requirements of the Uniform Relocation Assistance and Real Property Acquisitions Act of 1970, 42 U.S.C. §§ 4601-4655, and implementing regulations.

D. RECORDS AND RECORDS RETENTION

1. In accordance with 2 CFR § 200.333, Contractor/Consultant shall retain financial records, supporting documents, statistical records, and all other records pertinent to this Contract. The retention period shall be the longer of three (3) years after the expiration or termination of this Contract, or three years after the submission of the annual performance and evaluation report in which the project is reported on for the final time. Notwithstanding the above, if any litigation, claim, or audit pertaining to the Contract is started before the expiration of the applicable retention period, records must be retained until completion of the action and resolution of all issues that arise from it, or until the end of the required retention period, whichever is later.

2. Contractor/Consultant shall provide the State, including their representatives or agents, access to and the right to examine all records, books, papers, or documents related to the Contract and the use of Fund or SLFRF funds.

E. FEDERAL LABOR STANDARDS: *To the extent applicable*, Contractor/Consultant shall comply with Federal Labor Standards, including:

1. Davis-Bacon Act, 40 U.S.C. 3141-3149, as amended: All laborers and mechanics (as defined at 29 CFR §5.2) employed by Contractor/Consultant (including its subcontractors/subconsultants) in connection with construction contracts over $2,000, must be paid wages at rates not less than those prevailing on similar construction in the locality pursuant to the Davis-Bacon Act (40 U.S.C. §3141 et seq.), as amended and as supplemented by Department of Labor regulations, 29 C.F.R. Part 5; in addition, Contractors/Consultants must pay wages not less than once per week; except that these requirements do not apply to the rehabilitation of residential property if such property contains less than 8 units;
2. The Contract Work Hours and Safety Standards Act (40 U.S.C. 3701 et seq.), as supplemented by Department of Labor regulations (29 CFR Part 5), requiring that mechanics and laborers (including watchmen and guards) employed on federally assisted contracts of $100,000 or greater be paid wages of not less than one and one-half times their basic wage rates for all hours worked in excess of forty hours in a work-week. The requirements of 40 U.S.C. § 3704 apply to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous;
3. The Federal Fair Labor Standards Act (29 U.S.C. 201 et seq.), requiring that covered nonexempt employees be paid at least the minimum prescribed wage, and also that they be paid one and one-half times their basic wage rate for all hours worked in excess of the prescribed work-week;
4. The Copeland "Anti-Kickback" Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR part 3), which apply to contracts and subcontracts for construction, prosecution, completion, or repair of public buildings, public works or buildings, or works financed in whole or in part by Federal loans or grants, and requires payment of wages once a week and allows only permissible payroll deductions -- Contractor/Consultant is prohibited from inducing, by any means, any person employed in the construction , completion, or repair of public work or building or work financed by Federal loans or grants, to give up any part of the compensation to which he or she is otherwise entitled;
5. Department of Labor regulations in parallel with the requirements above:

    a. 29 CFR part 1: Procedures for Predetermination of Wage Rates

    b. 29 CFR part 5: Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction (Also, Labor Standards Provisions

Applicable to Non-construction Contracts Subject to the Contract Work Hours and Safety Standards Act)

c. 29 CFR part 6: Rules of Practice for Administrative Proceedings Enforcing Labor Standards In Federal and Federally Assisted Construction Contracts and Federal Service Contracts

d. 29 CFR part 7: Practice Before the Administrative Review Board With Regard to Federal and Federally Assisted Construction Contracts.

F. FAIR HOUSING AND NON-DISCRIMINATION

1. *To the extent applicable*, Contractor/Consultant shall comply with the following fair housing and non-discrimination laws. Any act of unlawful discrimination committed by Contractor/Consultant or failure to comply with applicable laws shall be grounds for termination of the Contract.

   a. Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. §2000d et seq., and Treasury's implementing regulations at 31 CFR Part 22), which prohibit discrimination on the basis of race, color, or national origin, under programs or activities receiving federal financial assistance. .
   b. The Fair Housing Act (Title VIII of the Civil Rights Act of 1968, as amended, 42 U.S.C. 3601–3619), which requires administering all programs and activities relating to housing and community development in a manner to affirmatively further fair housing. Title VIII further prohibits discrimination against any person in the sale or rental of housing, or the provision of brokerage services, including in any way making unavailable or denying a dwelling to any person, because of race, color, religion, sex, national origin, handicap or familial status.
   c. Title II of the Civil Rights Act of 1968 (25 U.S.C. 1301-1303), which prohibits discrimination because of race, color, religion, or natural origin in certain places of public accommodation.
   d. Architectural Barriers Act (ABA) of 1968, 42 U.S.C. 4151 et seq. The ABA requires access to buildings designed, built, altered, or leased by or on behalf of the federal government or with loans or grants, in whole or in part, from the federal government. As used in the ABA, the term "building" does not include privately owned residential structures not leased by the government for subsidized housing programs.
   e. Title IX of the Education Amendments Act of 1972, 20 U.S.C. 1681 et seq., which prohibits discrimination on the basis of sex in any federally funded education program or activity.
   f. Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. §794, which provides that no otherwise qualified individual shall solely by reason of his or her handicap be excluded from participation, denied program benefits, or subjected to discrimination under any program or activity receiving federal funding assistance.
   g. Section 508 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. §794d, which requires Federal agencies to make their electronic and information technology (EIT) accessible to people with disabilities, and applies to all federal agencies when they develop, procure, maintain or use electronic and information technology.

h. Age Discrimination Act of 1975, as amended, 42 U.S.C. 6101 et seq., and Treasure's implementing regulations at 31 CFR Part 23, which prohibit discrimination on the basis of age in programs and activities receiving federal financial assistance.
i. Title II of the Americans with Disabilities Act of 1990, 42 U.S.C. 12101 et seq., as amended by the ADA Amendments Act of 2008, which prohibits discrimination on the basis of disability under programs, activities, and services provided or made available by state and local government or instrumentalities or agencies thereto.
j. Housing for Older Persons Act of 1995 ("HOPA") (42 U.S.C. 3607), which governs housing developments that qualify as housing for persons age 55 or older.
k. Accessibility requirements contained in Title III of the Americans with Disabilities Act of 1990 (42 U.S.C. 12181 et seq.).
l. Executive Order 11063: Equal Opportunity in Housing, November 20, 1962, as amended by Executive Order 12259, and the regulations issued pursuant thereto, which pertain to equal opportunity in housing and non-discrimination in the sale or rental of housing built with federal assistance.
m. Executive Order 11246 (Johnson), September 24, 1965, as amended by Executive Order 11375 (Johnson), October 13, 1967, as amended by Executive Order 13672 (Obama), July 21, 2014, which prohibit discrimination in employment on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin. Further, contractors and subcontractors on federal and federally assisted construction contracts shall take affirmative steps to ensure that equal opportunity is provided in all aspects of their employment, including, but not limited to: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training and apprenticeship.

G. CONTRACTING WITH SMALL AND MINORITY BUSINESSES, WOMEN'S BUSINESS ENTERPRISES, AND LABOR SURPLUS AREA FIRMS

1. Contractor/Consultant shall take all necessary affirmative steps to ensure contracting opportunities are provided to small and minority businesses, women's business enterprises, and labor surplus area firms. As used in this contract, the terms "minority business" and "women's business enterprise" means a business that is at least fifty-one percent (51%) owned and controlled by minority group members or women. For purposes of this definition, "minority group members" are African-Americans, Spanish-speaking, Spanish surnamed or Spanish-heritage Americans, Asian-Americans, and Native Americans. Contractor/Consultant may rely on written representations by businesses regarding their status as minority, women and veteran businesses in lieu of an independent investigation.

2. Affirmative steps shall include:

   a. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

b. Ensuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources, for goods and/or services required in furtherance of the Contract;
c. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
d. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and
e. Using the service and assistance, as appropriate, of organizations such as the Small Business Administration, and the Minority Business Development Agency of the U.S. Department of Commerce; and
f. Requiring the subcontractor, if subcontracts are to be let, to take the affirmative steps listed in subparagraphs (a) through (e) of this section.

H. ENVIRONMENTAL REGULATORY COMPLIANCE

To the extent applicable, Contractor/Consultant must comply with federal environmental laws and regulations, including but not limited to:

1. Floodplain management and wetland protection:
    a. Executive Order 11990, Protection of Wetlands (May 24, 1977) (42 FR 26961), 3 CFR, 1977 Comp., p. 121, as interpreted by HUD regulations at 24 CFR 55, particularly sections 2 and 5 of the order;
    b. Executive Order 11988, Floodplain Management, May 24, 1977 (42 FR 26951), 3 CFR, 1977 Comp., p. 117, as interpreted in HUD regulations at 24 CFR part 55, particularly section 2(a) of the order;
2. The Coastal Zone Management Act of 1972 (16 U.S.C. § 1451 et seq.), as amended, particularly sections 307(c) and (d) (16 U.S.C. §§1456(c) and(d));
3. The National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 et seq.
4. In relation to water quality:
    a. Executive Order 12088, as amended by Executive Order 12580, relating to the prevention, control and abatement of water pollution;
    b. The Safe Drinking Water Act of 1974 (42 U.S.C. §§ 201, 300(f) et seq. and U.S.C. §349), as amended, particularly Section 1424(e) (42 U.S.C. §§ 300h-303(e)), which is intended to protect underground sources of water. No commitment for federal financial assistance can be entered into for any project which the U.S. Environmental Protection Agency ("EPA") determines may contaminate an aquifer which is the sole or principal drinking water source for an area (40 CFR 149); and
    c. The Federal Water Pollution Control Act of 1972, as amended, including the Clean Water Act of 1977, Public Law 92-212 (33 U.S.C. §1251, et seq.) which provides for the restoration and maintenance of the chemical, physical and biological integrity of the nation's water.

5. Endangered Species Act of 1973 (16 U.S.C. §1531 et seq.), as amended, particularly section 7 (16 U.S.C. §1536);
6. The Fish and Wildlife Coordination Act of 1958, as amended;
7. Wild and Scenic Rivers Act of 1968 (16 U.S.C. § 1271 et seq.), particularly sections 7(b) and (c) (16 U.S.C. §1278(b) and (c));
8. Executive Order 11738 (Nixon), Sept. 10, 1973, providing for administration of the Clean Air Act and the Federal Water Pollution Control Act With Respect to Federal Contracts, Grants, or Loans, and EPA regulations (40 CFR 15);
9. The Clean Air Act of 1970 (42 U.S.C. § 7401 et seq.) as amended, particularly sections 176(c) and (d) (42 U.S.C. § 7506(c) and (d)), and 40 CFR Parts 51 and 93, which prohibit engaging in, supporting in any way, providing financial assistance for, licensing or permitting, or approving any activity which does not conform to State or Federal implementation plans for national primary and secondary ambient air quality standards.
10. The Farmland Protection Policy Act of 1981, 7 U.S.C.A. §4201 et seq., particularly sections 1540(b) and 1541 (7 U.S.C. §4201(b) and §4202), and Farmland Protection Policy, 7 CFR 658, which require recipients of federal assistance to minimize the extent to which their projects contribute to the unnecessary and irreversible commitment of farmland to nonagricultural uses;
11. Noise abatement and control requirements at 24 CFR 51B;
12. Explosive and flammable operations requirements at 24 CFR 51C;
13. Requirements at 24 CFR 58.5(i) relating to toxic chemicals and radioactive materials;
14. Environmental Justice, Executive Order 12898—Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994 (59 FR 7629, Feb. 16, 1994), and Executive Order 14096 – Revitalizing Our Nation's Commitment to Environmental Justice for All, April 21, 2021 (88 FR 25251, April 26, 2023).
15. Clean Air Act and Water Pollution Control Act: For all contracts and subgrants in excess of $150,000, Contractor/Consultant must comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act, 42 U.S.C. §§ 7401-7671(q), and the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§ 1251-1387. Violations must be reported to DPMC which will, in turn, report the violation to the appropriate Federal agency or department.

I. EQUAL EMPLOYMENT OPPORTUNITY

1. All federally assisted construction contracts must include the equal opportunity clause provided under 41 CFR §60-1.4(b). Federally assisted construction contracts (defined in 41 CFR §60-1.3) include any agreement or modification thereof between any applicant and a person for construction work which is paid for in whole or in part with funds obtained from the federal government. Construction work is defined as "the

construction, rehabilitation, alteration, conversion, extension, demolition or repair of buildings, highways, or other changes or improvements to real property, including facilities providing utility services. The term also includes the supervision, inspection, and other onsite functions incidental to the actual construction." 41 CFR §60-1.3.

2. **Pursuant to 41 CFR §60-1.4(b), the following language shall be included in all federally assisted construction contracts and subcontracts:**

   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, color, religion, sex, sexual orientation, gender identity, 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, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided 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 considerations for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

   (3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

   (4) 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' representatives of the contractor's commitments under section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The contractor will furnish all information and reports required by Executive Order 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.

(7) 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 canceled, 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 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The contractor will include the provisions of paragraphs (1) through (8) 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 11246 of September 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 may be directed by the Secretary of Labor 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, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

J. ADDITIONAL MISCELLANEOUS CONTRACT PROVIONS

1. Rights to Inventions Made under a Contract or Agreement: For Federal awards that meet the definition of "funding agreement" under 37 CFR § 401.2 (a), if Contractor/Consultant wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," Contractor/Consultant must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts, and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

2. Prohibition on certain telecommunications and video surveillance services or equipment: Contractor/Consultant is prohibited from obligating or expending loan or grant funds to:

(1) Procure or obtain;
(2) Extend or renew a contract to procure or obtain; or
(3) Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115–232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
(i) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
(ii) Telecommunications or video surveillance services provided by such entities or using such equipment.
(iii) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

K. MISCELLANEOUS PROVISIONS

Attachment A: Byrd Anti-Lobbying Certification
Attachment B: Conflict of Interest Certification

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents of all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, United States Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Organization: _____

Street address: _____

City, State, Zip: _____

_____
CERTIFIED BY: (type or print)

_____
TITLE:

_____ _____
(signature) (date)

Approved by OMB

0348-0046

Disclosure of Lobbying Activities

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352

(See reverse for public burden disclosure)

1. Type of Federal Action: a. contract ____ b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	**2. Status of Federal Action:** a. bid/offer/application _____ b. initial award c. post-award	**3. Report Type:** a. initial filing _____ b. material change **For material change only:** Year _____ quarter _____ Date of last report_____

4. Name and Address of Reporting Entity: ____ Prime _____ Subawardee Tier_____, if Known: **Congressional District, if known:**	**5. If Reporting Entity in No. 4 is Subawardee,** Enter Name and Address of Prime: **Congressional District, if known:**
6. Federal Department/Agency:	**7. Federal Program Name/Description:** CFDA Number, *if applicable*: _____
8. Federal Action Number, *if known:*	**9. Award Amount**, *if known:* **$**
10. a. Name and Address of Lobbying Registrant *(if individual, last name, first name, MI):*	**b. Individuals Performing Services** *(including address if different from No. 10a)* *(last name, first name, MI):*
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.	**Signature: _____** **Print Name:_____** **Title:_____** **Telephone No.: _____ Date: _____**
Federal Use Only	**Authorized for Local Reproduction** **Standard Form - LLL (Rev. 7-97)**

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.

2. Identify the status of the covered Federal action.

3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.

4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.

5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.

6. Enter the name of the federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.

7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.

8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitations for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Included prefixes, e.g., "RFP-DE-90-001."

9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.

10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

    (b) Enter the full names of the individual(s) performing services, and include full address if different from 10(a). Enter Last Name, First Name, and Middle Initial (MI).

11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

CONFLICTS OF INTEREST CERTIFICATION

Section 4019 of the Coronavirus Aid, Relief, and Economic Security Act ("CARES Act") prohibits entities in which certain government officials and some of their immediate family members have a "controlling interest" from participating in certain government programs. Section 4019(c) of the CARES Act requires the principal executive officer and principal financial officer (or individuals performing similar functions) of any recipient of CARES Act funds to certify to the Secretary of the Treasury and the Board of Governors of the Federal Reserve System that the recipient is not a Covered Entity.

For definitions of "Covered Entity," "Covered Individual," and "Controlling Interest," see Section 4019(a) of the CARES Act.

Good Faith Certification:

Pursuant to section 4019(c) of the CARES Act, to the best of my knowledge and based on reasonable diligence, I certify to the Secretary of the Treasury (Secretary) and the Board of Governors of the Federal Reserve System (Board) that Contractor/Consultant is not a covered entity, as that term is defined in Section 4019(a)(2) of the CARES Act.

I further certify that Contractor/Consultant will immediately notify the Secretary and the Board if Contractor/Consultant becomes a covered entity, as that term is defined in section 4019(a)(2) of the CARES Act. If Contractor/Consultant becomes a covered entity, Contractor/Consultant will not enter into any transaction with the State of New Jersey involving CARES Act funds.

Chief Executive Officer

By: _____

Title: _____

Date: _____

Chief Financial Officer

By: _____

Title: _____

Date: _____

SECTION 23 07 19 - HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes insulation for HVAC piping systems other than those specified explicitly in other sections.

B. Related Sections:
   1. Section 230713 "Duct Insulation" for duct insulation.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
   2. Detail attachment and covering of heat tracing inside insulation.
   3. Detail insulation application at pipe expansion joints for each type of insulation.
   4. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
   5. Detail removable insulation at piping specialties.
   6. Detail application of field-applied jackets.
   7. Detail application at linkages of control devices.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

C. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products in accordance with ASTM E84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
   1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
   2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.7 COORDINATION

A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

C. Coordinate installation and testing of heat tracing.

1.8 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and " articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come into contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested in accordance with ASTM C871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable in accordance with ASTM C795.

E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

F. Flexible Elastomeric: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C534/C534M, Type I for tubular materials, Type II for sheet materials.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Aeroflex USA.
      b. Armacell LLC.
      c. K-Flex USA.

2.2 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.

B. Flexible Elastomeric and Polyolefin Adhesive: Solvent-based adhesive.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Aeroflex USA.
   b. Armacell LLC.
   c. K-Flex USA.
2. Flame-spread index shall be 25 or less and smoke-developed index shall be 50 or less as tested in accordance with ASTM E84.
3. Wet Flash Point: Below 0 deg F.
4. Service Temperature Range: 40 to 200 deg F.
5. Color: Black.

C. PVC Jacket Adhesive: Compatible with PVC jacket.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Johns Manville; a Berkshire Hathaway company.
   b. P.I.C. Plastics, Inc.
   c. Speedline Corporation.
   d. The Dow Chemical Company.

2.3 MASTICS AND COATINGS

A. Materials shall be compatible with insulation materials, jackets, and substrates.

B. Vapor-Retarder Mastic, Water Based: Suitable for indoor use on below-ambient services.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Childers Brand; H. B. Fuller Construction Products.
   b. Foster Brand; H. B. Fuller.
   c. Knauf Insulation.
   d. Mon-Eco Industries, Inc.
2. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
3. Service Temperature Range: 0 to plus 180 deg F.

C. Vapor-Retarder Mastic, Solvent Based, Indoor Use: Suitable for indoor use on below-ambient services.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Childers Brand; H. B. Fuller Construction Products.
   b. Foster Brand; H. B. Fuller.
   c. Mon-Eco Industries, Inc.
2. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
3. Service Temperature Range: 0 to 180 deg F.
4. Color: White.

D. Vapor-Retarder Mastic, Solvent Based, Outdoor Use: Suitable for outdoor use on below-ambient services.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Childers Brand; H. B. Fuller Construction Products.
      b. Foster Brand; H. B. Fuller.
   2. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
   3. Service Temperature Range: Minus 50 to plus 220 deg F.
   4. Color: White.

E. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Childers Brand; H. B. Fuller Construction Products.
      b. Foster Brand; H. B. Fuller.
      c. Knauf Insulation.
      d. Mon-Eco Industries, Inc.
   2. Water-Vapor Permeance: ASTM E96/E96M, greater than 1.0 perm at manufacturer's recommended dry film thickness.
   3. Service Temperature Range: 0 to plus 180 deg F.
   4. Color: White.

2.4 SEALANTS

A. Materials shall be as recommended by the insulation manufacturer and shall be compatible with insulation materials, jackets, and substrates.

B. Joint Sealants:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Childers Brand; H. B. Fuller Construction Products.
      b. Foster Brand; H. B. Fuller.
      c. Mon-Eco Industries, Inc.
      d. Owens Corning.
   2. Permanently flexible, elastomeric sealant.
      a. Service Temperature Range: Minus 150 to plus 250 deg F.
      b. Color: White or gray.

2.5 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C1136, Type I.
2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C1136, Type I.
3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C1136, Type II.
4. Manufacturers factory applied jacket rated for UV and continuous outdoor exposure.

2.6 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C1136, Type I, unless otherwise indicated.

B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Airex Manufacturing Inc.
   b. Johns Manville; a Berkshire Hathaway company.
   c. P.I.C. Plastics, Inc.
2. Adhesive: As recommended by jacket material manufacturer.
3. Color: White.
4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
   a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

2.7 TAPES

A. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. 3M Industrial Adhesives and Tapes Division.
2. Width: 2 inches.
3. Thickness: 6 mils.
4. Adhesion: 64 ounces force/inch in width.
5. Elongation: 500 percent.
6. Tensile Strength: 18 lbf/inch in width.

B. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. 3M Industrial Adhesives and Tapes Division.
      b. Avery Dennison Corporation, Specialty Tapes Division.
      c. Knauf Insulation.
   2. Width: 2 inches.
   3. Thickness: 3.7 mils.
   4. Adhesion: 100 ounces force/inch in width.
   5. Elongation: 5 percent.
   6. Tensile Strength: 34 lbf/inch in width.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
   1. Verify that systems to be insulated have been tested and are free of defects.
   2. Verify that surfaces to be insulated are clean and dry.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:
   1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
   2. Carbon Steel: Coat carbon steel operating at a service temperature of between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

C. Coordinate insulation installation with the tradesman installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping, including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and of thicknesses required for each item of pipe system, as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during storage, application, and finishing. Replace insulation materials that get wet.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
   1. Install insulation continuously through hangers and around anchor attachments.
   2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends attached to structure with vapor-barrier mastic.
   3. Install insert materials and insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.

4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:
1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward-clinching staples along both edges of strip, spaced 4 inches o.c.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward-clinching staples along edge at 2 inches o.c.
   a. For below-ambient services, apply vapor-barrier mastic over staples.
4. Cover joints and seams with tape, in accordance with insulation material manufacturer's written instructions, to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 25 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches in similar fashion to butt joints.

P. For above-ambient services, do not install insulation to the following:
1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.

3.4 PENETRATIONS

A. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.

3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
4. Seal jacket to wall flashing with flashing sealant.

B. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

3.5 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials, except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, Mechanical Couplings, and Unions:
1. Install insulation over fittings, valves, strainers, flanges, mechanical couplings, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as that of adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as that used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as that used for adjacent pipe. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
6. For services not specified to receive a field-applied jacket, except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing, using PVC tape.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

3.6 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

B. Insulation Installation on Pipe Flanges:
   1. Install pipe insulation to outer diameter of pipe flange.
   2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
   3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as that of pipe insulation.
   4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Pipe Fittings and Elbows:
   1. Install mitered sections of pipe insulation.
   2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

D. Insulation Installation on Valves and Pipe Specialties:
   1. Install preformed valve covers manufactured of same material as that of pipe insulation when available.
   2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
   3. Install insulation to flanges as specified for flange insulation application.
   4. Secure insulation to valves and specialties, and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.7 FIELD-APPLIED JACKET INSTALLATION

A. Where PVC jackets are indicated and for horizontal applications, install with 1-inch overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.
   1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

3.8 PIPING INSULATION SCHEDULE, GENERAL

A. Insulation conductivity and thickness per pipe size shall comply with schedules in this Section or with requirements of authorities having jurisdiction, whichever is more stringent.

B. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

C. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
   1. Underground piping.
   2. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.9 INDOOR PIPING INSULATION SCHEDULE

A. Refrigerant Suction and Hot-Gas Piping:
   1. All Pipe Sizes: Insulation shall be the following:
      a. Flexible Elastomeric: 1 inch thick.

B. Refrigerant Suction and Hot-Gas Flexible Tubing:
   1. All Pipe Sizes: Insulation shall be the following:
      a. Flexible Elastomeric: 1 inch thick.

C. Refrigerant Liquid Piping:
   1. All Pipe Sizes: Insulation shall be the following:
      a. Flexible Elastomeric: 1 inch thick.

3.10 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

A. Refrigerant Suction and Hot-Gas Piping:
   1. All Pipe Sizes: Insulation shall be the following:
      a. Flexible Elastomeric: 1 inch thick.

B. Refrigerant Suction and Hot-Gas Flexible Tubing:
   1. All Pipe Sizes: Insulation shall be the following:
      a. Flexible Elastomeric: 1 inch thick.

C. Refrigerant Liquid Piping:
   1. All Pipe Sizes: Insulation shall be the following:
      a. Flexible Elastomeric: 1 inch thick.

3.11 INDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Piping, Exposed:
   1. None.
   2. PVC: 20 mils thick.

3.12 OUTDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Piping, Concealed:
   1. None.

D. Piping, Exposed:
   1. Aluminum, stucco embossed with z shaped locking seam 0.020 inch thick.

END OF SECTION 23 07 19

SECTION 27 05 00 - COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included:

1. Communications equipment coordination and installation
2. Grounding and bonding for communications systems
3. Hangers and supports for communications systems
4. Conduits and back boxes for communications systems
5. Cable trays for communications systems
6. Surface raceways for communications systems
7. Vibration and seismic controls for communications systems
8. Identification for communications systems
9. Common communications installation requirements

1.2 Pricing:

1. Base Bid
   a. Submit the total cost for a complete installation of the communications cabling system as described in the communications drawings and specifications documents.
2. Unit Pricing
   a. Submit unit pricing for all major components of each system for the addition or deletion those components.
   b. Unit pricing shall include material and labor to furnish, install test, and provide the required as-built documentation.
   c. Submit units pricing for each component, including, but not limited to:
      1) 4-post rack
      2) UPS and batteries
      3) Vertical and horizontal wire managers
      4) Patch panels
      5) Typical outlets, including cable, connectors, faceplate and accessories
      6) Patch cords, all lengths

1.3 RELATED DOCUMENTS

A. Division 01 "General Requirements"

B. Division 26 Section "Grounding and Bonding for Electrical Systems"

C. Division 26 Section "Surge Protection for Low Voltage Electrical Power Circuits"

D. Division 26 Section "Raceway and Boxes for Electrical Systems"

E. Division 27 Section "Communication Rooms Fittings"

F. Division 27 Section "Communications Horizontal Cabling"

G. Division 27 Section "Communications Connecting Cords, Devices and Adapters"

H. Division 27 Section "Commissioning of Communications"

1.4 ABBREVIATIONS AND DEFINITIONS

A. Abbreviations:
ANSI: American National Standards Institute
ASTM: American Society for Testing and Materials
ARC: Aluminum rigid conduit
BICSI: Building Industry Consulting Service International.
UL: Listed by Underwriters Laboratories
EIA: Electronic Industries Alliance
EMI: Electromagnetic Interference
EMT: Electrical Metallic Tubing
ENT: Electrical Non-metallic Tubing
GRC: Galvanized rigid steel conduit
IDF: Intermediate Distribution Frame
LAN: Local Area Network
LMC: Liquidtight Metal Conduit
RCDD: Registered Communications Distribution Designer
RGS: Rigid Galvanized Steel
TIA: Telecommunications Industry Association
UTP: Unshielded Twisted Pairs

B. Definitions
1. "Provide" shall mean furnish and install.
2. "Work" shall mean all labor, materials, equipment, apparatus, controls, accessories, and all other items required for a proper and complete installation.
3. "Concealed" shall mean hidden from sight in chases, furred spaces, shafts, embedded in construction or in crawl space.
4. "Exposed" shall mean not installed underground or concealed as defined above.
5. "Furnished by others" shall mean materials or equipment purchased and set in place under other sections of the general contract and connected to the systems covered by this section of the specifications by this trade contractor.

1.5 SUBMITTALS

A. General Procedures
1. All submittals shall comply with the requirements of Division 01.
2. Do not commence work that requires review of any submittals until receipt of returned submittals with appropriate final action.

3. Submittals that deviate from the procedures outlined herein will be rejected. No allowance or extension of project time will be considered due to lost time associated with procedural deviation.
4. Do not submit substitute items that have not been approved.
5. Preparation and Transmittal of Submittals:
    a. Transmit each submittal with a transmittal form. Submittals received without a transmittal form may be returned without action. The transmittal form shall include: project name and address, number and date of submittal, name and address of the Contractor.
    b. Sign or initial each copy of each submittal to certify compliance with requirements of the Contract Documents.
    c. Submittals shall include a Table of Contents listing all items included and relevant references to contract documents. For product data sheets the table of contents shall include: product name and manufacturer, page number of the corresponding specification section.
    d. Product data sheets shall be grouped according to the specifications sections. Submittals shall include relevant information only. Product being submitted shall be clearly identified.
6. Timing of Submittals
    a. Prepare and transmit each submittal requiring approval sufficiently in advance of scheduled performance of the related work to allow for adequate review and processing time, including time for re-submittal if necessary.
    b. If processing time for a particular submittal will be critical to progress of the work, advise and notify the Owner or its representatives accordingly.

B. List of Submittals:
1. Pre-Construction Submittals:
    a. Qualifications and Certificates
    b. Product Data for every product installed
    c. Manufacturer quality assurance tests and source quality control reports
    d. Shop drawings (including generation of floor plans with outlet IDs)
    e. Samples
    f. Pull-schedules
    g. Manufacturer warranty registration for the structured cabling system.
2. During Construction:
    a. Coordination drawings
    b. System labeling schedules
    c. Labeling samples
    d. Pull-schedules
    e. Patch schedules
    f. Field quality control report/test results
3. Post Construction:
    a. Record (as-built) drawings

b. Cable administration drawings and printouts
c. Pull-schedules
d. Test results
e. Maintenance data
f. Manuals
g. Warranties and certifications

C. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for equipment racks and cabinets. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

D. Samples: provide product samples for cables, outlets, connectors, labels, patch cords. Samples shall include standard finishes and color options. For large equipment, such as racks and cabinets, provide standard finishes and color options only.

E. Pull-schedules:
1. For all cables to be installed.
2. Horizontal cables pull schedules shall include, at least, the following fields:
a. Sequential line number
b. Room name and number
c. Outlet ID
d. Jack ID
e. Cable ID
f. IDF/IT Room
g. Rack ID
h. Patch panel and port ID
i. Cable type
j. Comments

F. Shop Drawings:
1. For communications equipment room fittings.
a. Include plans, elevations, sections, details, and attachments to other work.
b. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
c. Equipment Racks and Cabinets: Include workspace requirements and access for cable connections.
d. Grounding: Indicate location of grounding bus bar and its mounting detail showing standoff insulators and wall mounting brackets.
2. For horizontal distribution
a. Include plans showing outlet locations.
b. Show backbone and horizontal pathways and cable routing.
c. Cabling pathways and routes to include:

1) Pathways to include cable tray (or other wireway) route to scale, relationship to structural electrical and mechanical elements.
2) Clearances and access above and to the side.
3) Vertical elevations above floor or bottom of ceiling structure.
4) Vertical and horizontal offsets and transitions
5) Load calculations showing compliance with the maximum live and still load rating.

3. Labeling scheme and samples

G. As-Built Drawings:
1. Must document all changes that occurred during the installation.
2. Shall include routes of all backbone pathways, backbone cables and station cable trunks (main routes).
3. Produce, and keep up-to-date, a complete record as-built set of prints (black-line bonds) which shall be corrected, and marked-up to show every change from the original Specifications and Contract Drawings through final acceptance. This set of drawings shall be protected against soiling, tears, and similar damage and defacement. This set shall be kept on the job site and shall be used only as a record set.
4. Upon completion of the work produce and submit a final set of record drawings by updating the AutoCAD files of the construction set of drawings (to be provided by the Owner) with the information from the as-built set. The submittal shall include the original record set of black-bonds and the electronic files of the as-built drawings in both AutoCAD format and PDF format.

H. Test Results
1. Test results shall show compliance with the testing requirements for the specific cabling system.
2. Provide test results for 100% of the backbone and station cables installed.
3. Provide test results in the format(s) requested.

I. Warranties
1. Provide a minimum 1-year warranty on the physical installation.
2. Provide and extended (15-year minimum) manufacturer warranty for the complete end-to-end structured cabling system for all the systems components, including the horizontal and backbone distribution.
3. Provide warranties within 30 business days after the project was completed.

J. Qualifications
1. Installer Qualifications:
a. Qualification Data: For Installer, qualified layout technician, installation supervisor, and field inspector.
b. Cabling installer must be Certified Installer for the cabling system provided.

2. Seismic Qualification Certificates: For equipment frames from manufacturer.
    a. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
    b. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions. Base certification on the maximum number of components capable of being mounted in each rack type. Identify components on which certification is based.
    c. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

K. Definition of Acceptance
1. The Owner acceptance of the installation will be based upon satisfactory performance during a thirty (30) day period of beneficial use beginning after all of the other acceptance requirements listed below have been satisfied in full by the Owner.
2. Acceptance of the installation will be reasonable and good faith determined by the Owner or its agents. Partial use of the installation prior to completion will not be considered as contributing in part or in whole to the thirty-day period. Problems discovered during the thirty (30) day period covered under the responsibilities of the Vendor must be fixed at no cost to the Owner.
3. The other acceptance criteria are the following:
    a. All tests have been passed and all required test results have been submitted and approved.
    b. All required documentation has been submitted by Contractor.
    c. All required labeling has been completed.
    d. All work has been completed as required by the specifications, including all cable runs and pathways in their permanent places, and all cabinets, racks and cable pathways (i.e. ladder, tray, etc.) secured.
    e. All Punch List items have been completed.
    f. The Contractor has obtained the warranty for the installation.
    g. The Contractor has submitted written notification that the installation is completed and that all specification requirements have been met.
4. Upon satisfactory completion of acceptance requirements by the Contractor, and after satisfactory performance during the thirty (30) day period, and correction of any defects found, the Owner will notify the Contractor in writing of its acceptance of the installation.

1.6 SUBSTITUTIONS, DEVIATIONS AND CHANGES

A. Substitutions
1. Requests for substitution are only permitted for materials specified with an "or approved equivalent" clause or other language of same effect in the Contract Documents.

2. Substitutions may be permitted if the requirements of the proposed substitution comply with the general requirements and product specifications of the Contract Documents.

B. Deviations
1. Any deviations or changes involving extra work are not permissible without prior review and written approval by the Owner or its duly authorized representative.

1.7 QUALITY ASSURANCE

A. All products shall be installed new, best of their respective kinds, free from defects, listed by Underwriter's Laboratories for the intended use, and bearing their label.

B. All products shall be provided as specified, without exception, unless approved in writing prior to the bid.

C. Non-compliant products installed as a part of this Contract shall be removed and replaced and all costs for removal and replacement shall be borne solely by the Contractor(s).

D. Layout Responsibility: Preparation of Shop Drawings shall be under the direct supervision of RCDD.

E. Installation Supervision: Installation shall be under the direct supervision of a Registered Technician or Level 2 Installer, who shall be present at all times when Work of this Section is performed at Project site.

F. Field Inspector: Currently registered by BICSI as RCDD to perform the on-site inspection.

G. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

H. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.

I. Grounding: Comply with ANSI-J-STD-607-A.

J. Seismic Performance Requirements:
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation earthquake motions determined according to SEI/ASCE 7.
2. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

1.8 COORDINATION

A. Coordinate layout and installation of communications equipment with Owner's LAN equipment and telecommunications service suppliers.

B. Meet jointly with Owner to exchange information and agree on details of equipment arrangements and installation interfaces.

C. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

D. Coordinate layout and installation of communications pathways with the other trades. Survey the facility to locate conduits, sleeves and other pathways provided by others.

E. Coordinate furniture mounted components with the furniture vendor.

F. Coordinate cable routing in the ceiling with the other trades.

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS

A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.

B. Comply with ANSI-J-STD-607-A.

C. Telecommunications Main Grounding Bus Bar
   1. The TMGB must be a predrilled copper bus bar with holes for use with standard- sized lugs, have a minimum dimension of 6.3 mm (0.25 in) thick by 101 mm (4 in) wide, and variable length. It must be listed by an NRTL.
   2. Hole patterns on the bus bars shall accommodate two-hole lugs per the recommendation of BICSI and ANSI-J-STD-607-A standards.
   3. Insulators shall electrically isolate bus bars from the wall, or other mounting surfaces, thereby controlling the current path.
   4. Provide required stainless-steel hardware to fasten the two-hole ground lugs to the bus bar.
   5. Stand-Off Insulators: Comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

2.2 HANGERS AND SUPPORTS FOR COMMUNICATIONS SYSTEMS

A. Cable Support: NRTL labeled.

B. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.

C. Cable hangers and non-continuous supports shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Cable tie slots fasten cable ties to brackets.

D. Shall have various attachment options for: wall, ceiling, joist, beam, flange, raised floor pedestal and others type of mounting.

E. Support brackets with cable tie slots for fastening cable ties to brackets.

F. Lacing bars, spools, J-hooks, and D-rings, straps and other devices.

G. Cable straps (ties) shall be reusable Velcro-style with hook and loop or d-ring, available in various colors and sizes. Plenum rated straps shall be used in plenum spaces.

H. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal.

a. ERICO Caddy.
b. Eaton B-Line
c. Panduit.
d. Or approved equal.

2.3 CONDUITS AND BACKBOXES FOR COMMUNICATIONS SYSTEMS

A. Conduits and Backboxes:
1. Provide where indicated on drawings or as required.
2. Conduit and boxes sizes as shown on the communications drawings.
3. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems."

B. Flexible metal conduit shall not be used unless specifically noted.

2.4 SLEEVES FOR PATHWAYS AND CABLES

A. Refer to Division 26 Electrical

B. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

C. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral water-stop, unless otherwise indicated.

2.5 SLEEVE SEALS AND FIRESTOPPING FOR COMMUNICATIONS PATHWAYS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.

B. Comply with TIA/EIA-569-A, Annex A, "Firestopping."

C. Comply with BICSI TDMM, "Firestopping Systems" Article.

D. Sealing Elements: Interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of pathway or cable.

E. Pressure Plates: Stainless steel. Include two for each sealing element.

F. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

G. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
   1. Advance Products & Systems, Inc.
   2. Calpico, Inc.
   3. Metraflex Co.
   4. Pipeline Seal and Insulator, Inc.
   5. Hilti
   6. Approved equal

2.6 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

2.7 VIBRATION AND SEISMIC CONTROLS FOR COMMUNICATIONS SYSTEMS

A. Communications systems components shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. The term "withstand" means "the unit will remain in place without separation from any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event".

C. Communications equipment shall be seismically rated and braced according to IBC 1621.

2.8 IDENTIFICATION FOR COMMUNICATIONS SYSTEMS

A. Comply with requirements of TIA/EIA-606-A and UL969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

B. Comply with requirements of Division 26 Section "Identification for Electrical Systems".

C. The identification for the communications systems shall meet all the requirements of a Class 3 facility as defined by ANSI/TIA/EIA 606-A, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.

D. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

E. Identify all the components of the communications systems.

F. For fire-resistant plywood, do not paint over manufacturer's label.

G. All labels shall be preprinted or computer-printed type.

H. Type, format, wording, printing, and placement of labels shall be coordinated with Owner's existing administration plan. Items and/or issues not addressed in Owner's established administration plan shall be addressed in accordance with TIA/EIA 606-A Standard (e.g. cable tray, conduits, junction boxes, grounding systems, etc).

I. Labeling System
   1. PC-based software, WINDOWS compatible, capable of supporting alpha numeric characters and Windows True Type Fonts.
   2. Compatible with laser printers.
   3. Label sizes supported:
   4. Minimum: 0.8" W x 0.2" H.
   5. Maximum: 3.0" W x 12.0" H.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR COMMUNICATIONS INSTALLATION

A. All materials, cables, components, and all aspects of the installation must meet all local, state, and federal laws, as well as applicable code and regulatory requirements. They must also meet the requirements of any other entity legally empowered to set standards or codes governing composition and use in this installation, as well as any rules specific to the site. Code and regulatory requirements must prevail if there are any conflicts with requirements stated or implied in this specification and its companion documents. Where there is uncertainty in determining precedence, or what specific code or regulatory requirements apply, an Authority Having Jurisdiction (AHJ) over the issue in question will decide.

B. Take all necessary safety and health precautions and warnings required by codes and regulations to protect the project, its workers, the public, and the property of others. Applicable OSHA regulations or AHJ directives must be followed. The Contractor is responsible for ensuring that any subcontractors it uses comply with these requirements.

C. Perform all work required under this specification in a skillful and professional manner in accordance with standards and practices documented and/or accepted by industry, such as the ANSI/TIA/EIA, NECA standards and codes and the BICSI TDMM manuals. The Contractor's technicians must be familiar with the proper assembly and installation of all components they are working with, and must follow manufacturer's specific installation requirements.

D. .

E. Order all components in a timely manner so that installation dates are not compromised. Materials must either be on hand, or available on short notice, so that the installation may be expedited if required, or if the opportunity to do so presents itself.

F. Provide all materials, and the necessary labor and services required to ensure all components of the system are completely installed in accordance with the intent of the Contract Documents.

G. Compliance with the provisions of this specification does not relieve the Contractor of the responsibilities of furnishing materials, equipment and systems of proper design, mechanically and electrically suited to meet operating guarantees at the specified service conditions.

H. Notifying the General Contractor/Construction Manager and Design team in writing within 1 business day about the discovery of, but not limited to, the following:
   1. Problematic or missing pathways
   2. Field conflicts
   3. Work by other trades that is impeding the telecommunications installation resulting in a possible schedule, cost or quality impact
   4. Unsafe working conditions
   5. Materials with problematic lead times
   6. Media exceeding length limitations as defined by the governing standards for that media and its application
   7. Live systems put at risk by the installations activities
   8. Access required to live rooms

I. All materials shall be installed as per the manufacturers' instructions, unless noted otherwise.

J. Comply with NECA 1.

K. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

L. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

M. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both communications equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

N. Right of Way: Give to piping systems installed at a required slope.

O. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

P. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

3.2 GROUNDING AND BONDING

A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.

B. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

C. Comply with ANSI-J-STD-607-A.

D. Locate grounding bus bar to minimize the length of bonding conductors. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

E. Bonding to all non-active (non-current carrying) metal support structures, rack, runway etc. within each Telecommunication Room or Space. Coordinate this bonding with the supplier and installer of rack, runway etc.

F. The TMGB/TGB is to provide a single point ground reference within the room and is not to be used as an AC equipment ground

G. All cabling used to bond grounds are to be tagged with labels with the point of origin i.e. going to/coming from, with printed labels.

3.3 PATHWAYS INSTALLATION FOR COMMUNICATIONS SYSTEMS (HANGERS AND SUPPORTS, CONDUITS AND BACKBOXES, CABLE TRAYS AND RACEWAYS)

A. Comply with NECA 1

B. Cable Trays: Comply with NEMA VE 2, TIA/EIA-569-A and manufacturer's installation procedures.

C. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.

D. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.

E. Install manufactured conduit sweeps and long-radius elbows whenever possible.

F. All metal cable trays, metal cable raceways, or other metallic pathways must be grounded. Joined sections must preserve ground continuity.

G. Install cable tray systems as shown in construction drawings. The locations shown may need to be adjusted slightly in the field to assure proper placement.

H. All cable tray sections shall be field cut to length as required with a minimum number of splice points. All field cuts shall be made using the manufacturers recommended equipment.

I. Cable tray supports must be suited to the cable tray types they are employed with and loads they will carry. Manufacturer's recommendations on support spacing must be followed.

J. Cable trays and cable raceways shall be mounted at heights as called for in the construction documents. In areas where a minimum of 300 mm (12 in) access headroom is not available, the contractor shall notify the owner.

K. The inside of cable trays shall be free of burrs, sharp edges or projections that can damage cable insulation. Abrasive supports (e.g., threaded rod) installed within the cable fill area shall have that portion within the tray protected with a smooth, non-scratching covering so that cable can be pulled without physical damage.

L. Care shall be taken to ensure that access to other building components (e.g., air conditioning ducts) is not restricted by cable pathways.

M. Cable trays shall not be used as walkways, ladders, or equipment supports.

N. Cable management and support hardware must be UL listed for use in the environments in which they will be employed.

O. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.

P. Install cable trays to route cables if conduits cannot be located in these positions.

Q. Secure conduits to backboard when entering room from overhead.

R. Extend conduits 3 inches above finished floor.

S. Provide metal conduits with grounding bushings and connect with grounding conductor to grounding system.

T. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

U. Pathway Installation in Communications Equipment Rooms (IDF/MDF Server Room):
   1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
   2. Install cable trays to route cables if conduits cannot be located in these positions.
   3. Secure conduits to backboard when entering room from overhead.
   4. Extend conduits 3 inches (76 mm) above finished floor.
   5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

3.4 SLEEVES INSTALLATION FOR COMMUNICATIONS SYSTEMS

A. Communications penetrations occur when pathways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Cut sleeves to length for mounting flush with both surfaces of walls.

F. Extend sleeves installed in floors 50 mm above finished floor level.

G. Size pipe sleeves to provide 6.4-mm annular clear space between sleeve and pathway or cable, unless indicated otherwise.

H. Seal space outside of sleeves with grout for penetrations of concrete and masonry

   1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 7 Section "Joint Sealants."

J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pathway and cable penetrations. Install sleeves and seal pathway and cable penetration sleeves with firestop materials. Comply with requirements in Division 7 Section "Through-Penetration Firestop Systems."

K. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel or cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 25-mm annular clear space between pipe and sleeve for installing mechanical sleeve seals.

M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 25-mm annular clear space between pathway or cable and sleeve for installing mechanical sleeve seals.

N. Provide sound proofing of all penetrations as required. Refer to architectural and electrical drawings for details.

3.5 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.6 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for communications installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 7 Section "Through-Penetration Firestop Systems."

B. Comply with TIA/EIA-569-A, Annex A, "Firestopping."

C. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.7 IDENTIFICATION FOR COMMUNICATIONS SYSTEMS

A. Identify ALL system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

B. See Evaluations for discussion of TIA/EIA standard as it applies to this Section. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 3 level of administration including optional identification requirements of this standard.

C. Color-code cross-connect fields and apply colors to voice and data service backboards, connections, covers, and labels.

D. All permanent labels must be durable and legible and suited for long term use in the environments in which they will be located. Labels shall be preprinted or computer-printed type. Handwritten labels are unacceptable unless approved by the Owner.

E. Label all racks and cabinets as detailed in the construction drawings. Cabinet and rack labels must be large enough to be viewed from 15' away from the rack or cabinet. Cabinets and racks shall be labeled with professionally made signage.

F. Grounding and Bonding
   1. All system components shall be labeled complying with TIA/EIA-606-A.
   2. Labels shall be located on conductors as close as practicable to their point of termination in a readable position. Labels shall be nonmetallic and include the information "IF THIS CONNECTOR OR CABLE IS LOOSE OR MUST BE REMOVED, PLEASE CALL THE BUILDING TELECOMMUNICATIONS MANAGER
   3. Provide nonmetallic pre-printed labels, white background with black printing that can be permanently mounted to the busbar.
   4. The bonding conductors for telecommunications, TBB conductor, and each grounding equalizer shall be green or marked with a distinctive green color.

G. Labeling scheme for all communications systems is subject to prior approval by the Owner.

END OF SECTION 27 05 00

SECTION 27 15 00 - COMMUNICATIONS HORIZONTAL CABLING

PART 1 - GENERAL

1.1 SUMMARY

A. This section describes the components and practices to be used when installing horizontal cabling.

B. Section Includes:

1. Pathways for horizontal cables
2. Horizontal copper cables
3. Cable connecting hardware: connectors, patch panels, outlets
4. Cable identification products

C. Provide Category 6/6A UTP horizontal cabling system.

1.2 RELATED DOCUMENTS

A. Division 01 "General Requirements"
B. Division 26 Section "Grounding and Bonding for Electrical Systems"
C. Division 26 Section "Surge Protection for Low-Voltage Electrical Circuits"
D. Division 26 Section "Raceway and Boxes for Electrical Systems"
E. Division 27 Section "Common Work Results for Communications"
F. Division 27 Section "Commissioning of Communications"
G. Division 27 Section "Communications Rooms Fittings"
H. Division 27 Section "Communications Connecting Cords, Devices and Adapters"

1.3 SUBMITTALS

A. Refer to Division 27 section "Common Work Results for Communications".

1.4 QUALITY ASSURANCE

A. Refer to Division 27 section "Common Work Results for Communications".

1.5 COORDINATION

A. Refer to Division 27 section "Common Work Results for Communications".

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide product by one of the following manufacturers

1. Panduit/General Cable
2. Leviton/Berk-Tek
3. Ortronics/Superior Essex
4. Or approved equal

2.2 UNSHIELDED TWISTED PAIR (UTP) HORIZONTAL CABLES

A. Category 6 and 6A, 100-ohm 4-pair, UTP cables, blue jacket

B. Electrical and transmission shall meet or exceed:
   1. ISO/IEC 11801 Class Ea for electrical performance specifications.
   2. ANSI/TIA-568-C for performance specifications.

C. Topology shall comply with the requirements of TIA/EIA-568-C.1

D. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 1651, and NFPA 70 for the following types:
   1. Plenum Rated, Conductive: Type CMP complying with NFPA 262 for cable runs in plenum spaces. Plenum Rated, Conductive: Type CMP complying with NFPA 262 for cable runs in plenum spaces.

E. Quantity of cables to outlets as noted on the drawings.
   1. Provide Category 6A cables for the wireless access point outlets and Category 6 cables for all other outlets.

2.3 UTP TERMINATION HARDWARE

A. General Requirements for UTP Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.

B. Mechanical and transmission for UTP hardware shall meet or exceed:
   1. ICEA S-90-661 for mechanical properties.
   2. TIA/EIA-568-B.2 for performance specifications.

C. 24/48-Port Category 6/6A UTP Patch Panels.
   1. 2U mountable in 19-inch rack.
   2. 100-ohm, balanced four-pair, eight-position modular category 6/6A connector.
   3. Cable management bar.

D. Provide:
   1. Sufficient panels to accommodate termination of all horizontal cables installed.
   2. Terminate cables for data, VoIP, WAP, security and AV on separate patch panels.
   3. Provide single sided (front only) horizontal wire managers as shown on drawings.

E. Connectors:
   1. 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular, Category 6/6A.
   2. Provide color-coded icon inserts for each connector. Specific colors and icons to be coordinate with the Owner's representative.

2.4 WORK AREA OUTLETS

A. Connectors:
   1. 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular, category 6/6A.

2. Mechanical and transmission shall meet or exceed:
    a. ICEA S-90-661 for mechanical properties.
    b. TIA/EIA-568-B.2 for performance specifications.
    c. Connector colors to match the color to match the color of the faceplate they are mounted in. Colors and finishes to be approved by Architect via submittals.

B. Faceplates
1. Wall phone, 2 and 4-port faceplates, furniture bezels and surface boxes for use with snap-in jacks accommodating any combination of UTP work area cords. Refer to detail drawings for configurations.
2. Surface mounted box, plenum rated for two connectors for ceiling mounted WAP, camera, room schedulers and AV outlets.
3. Colors to be approved by Architect via submittals.
    d. Steel wall phone faceplate with studs.

4. Plastic faceplate: High-impact plastic. Coordinate colors Architect .
5. Exact faceplates for floor mounted outlets to be coordinated with electrical contractor.
6. Exact faceplates for furniture, including conference tables, to be coordinated with furniture vendor and AV contractor.
7. Provide snap-in icons of different colors for
    a. Voice/data network connection
    b. WAPs
    c. Security connections (cameras, intercoms, etc…)
    d. AV connections
    e. Colors to be coordinated with Owner's representative before ordering.

C. Color and finishes of the faceplates and connectors shall be approved by Architect via submittals.
D. Provide blank insert, dust covers and color-coded inserts. Specific colors for color coded inserts to be coordinated with Owner before ordering.
E. Factory labeled by silk-screening or engraving for stainless steel faceplates.
F. Machine printed, in the field, using adhesive-tape label.
G. Snap-in, clear-label covers and machine-printed paper inserts.

2.5 PATHWAYS
A. Refer to Section 270500 "Common Work results for Communications".

2.6 GROUNDING AND BONDING
A. Refer to Section 270500 "Common Work results for Communications".

2.7 IDENTIFICATION
A. Refer to Section 270500 "Common Work results for Communications".

PART 3 - EXECUTION

3.1 GENERAL

A. All materials shall be installed as per the manufacturers' instructions, unless noted otherwise.

B. Comply with NECA 1.

C. Comply with BICSI TDMM for installation and testing of communications horizontal cabling.

D. All work shall be performed in a professional manner.

E. Install cable after interior of building has been physically protected from the weather and as much mechanical work that is likely to damage cabling as possible has been completed without impacting the overall schedule.

F. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters.

G. Conceal raceways and cables except in unfinished spaces.

H. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

I. Terminate conductors; no cable shall contain un-terminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.

J. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.

K. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.

L. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.

M. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Heat lamps shall not be used for heating.

N. In the communications equipment room, install a 10-foot- (3-m-) long service loop neatly coiled.

O. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

P. All UTP cables, links, and their termination hardware must comply with the applicable specifications included in the most current versions of the ANSI/TIA 568-C.0, 568-C.1 and 568-B.2 standards and its relevant addenda (including 568-B.2-1 and 568-B.2-10), as well as their referenced and associated documents unless otherwise noted in this specification. Termination practices must follow manufacturers' guidelines and the requirements of these standards. Any discrepancies must be brought to the attention of the Owner prior to termination for resolution.

Q. Unless otherwise noted, optical fiber cables, links, and components must comply with ANSI/TIA 568-C.0, ANSI/TIA 568-C.1, and ANSI/TIA 658-C.3 requirements.

R. Surface mounted communications outlet boxes must be securely fastened so that they will not come loose over time. Use of double backed adhesive tape or Velcro is not acceptable.

S. All exposed cabling entering or exiting modular furniture and tables shall be protected with spiral wrap, flexible conduit or similar.

T. All metallic communications cables must be listed and marked as per Article 800 of the NEC (NFPA 70, edition recognized by AHJ). All fiber optic cables must be listed and marked as per Article 770 of the NEC (NFPA 70, edition recognized by AHJ). Listings of cables employed on the project (e.g. CMP, CMR, OFNP, OFNR, etc.) must be in accordance with the requirements of this specification and its associated documents.

U. In situations where there is a high density of cabling in racks, the Contractor must utilize techniques, and if necessary, provide additional support structures in addition to the specified racks and cable trays, to be sure that cable support, routing, and termination are properly performed.

V. Any cable damaged or exceeding recommended installation parameters during installation or testing shall be replaced by the contractor prior to final acceptance at no cost to the Owner.

3.2 HORIZONTAL CABLING INSTALLATION

A. General Requirements for Cabling:

1. Comply with TIA/EIA-568-B.1.
2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices".
3. Terminate all conductors; no cable shall contain un-terminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
4. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, racks, frames, and terminals.
5. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
6. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Use lacing bars and distribution spools.
7. Install service loop on each end of cable, as required. Provide minimum 10-foot loop at the telecom room end and 10-foot loop at the outlet end (coiled in the ceiling above outlet location), unless cables exceed maximum length.
8. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

B. UTP Cable Installation

1. Comply with TIA/EIA-568-B.2.
2. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.
3. Cables shall be dressed and terminated in accordance with manufacturer's recommendations and best industry practices, such as those in the BICSI TDMM manuals and the NECA/BICSI 568-2006 standard.
4. All 4 pair cables shall be terminated on the jack and patch panels using T568-B wiring scheme.
5. For Category rated 4-pair UTP cables (i.e. recognized under the TIA 568-standards), pair untwist at the termination shall not exceed 12 mm (0.5 inch).
6. For Category rated 4-pair UTP cables (i.e. recognized under the TIA 568-standards), the cable jacket shall be maintained as close as possible to the termination point. Not more than 1.0"of cable jacket shall be removed.
7. Cables shall be neatly bundled and dressed to their respective patch panels or wiring blocks. Each panel or block shall be fed by an individual bundle separated and dressed back to the point of cable entrance into the rack or frame. Cable bundles must be neat, but should not be perfectly groomed to avoid potential "alien crosstalk" problems.
8. When terminating to patch panels, 4-pair cables must be routed from both sides of racks and cabinets to their termination points on a given patch panel, rather than being run to the panel from a single direction.
9. Cable minimum bend radius limit and maximum pulling tension limit shall not be violated. Bend radius limit for 4-pair UTP = 4 X Cable OD. Pulling tension on 4-pair UTP cables shall not exceed 25-lbf.
10. In office environments, UTP cable runs must provide for ten feet of slack above the ceiling at the telecom outlet end and fifteen feet in the Telecom Room unless otherwise specified or unless the total cable length exceeds 295 feet. Slack must be stored neatly and safely as appropriate to the location. Wherever practical, slack must be in an extended loop or in a figure eight shape rather than in a circular loop, and attention to bend radius must be taken into account.
11. Where possible, fiber cables and copper cables running in the same cable tray must be kept separated. In situations where they have to run together, or where they must cross each other, the fiber cables must be on top.
12. Suitable coverings must protect station jacks and faceplates until work is completed in the areas they are situated in. Locations with terminated jacks prior to installation in faceplates must have the jacks protected in a suitable covering and stored in a manner that minimizes the possibility of damage to the jacks as well as to the cables terminated on them.
13. Cables shall be dressed and terminated in accordance with manufacturer's recommendations and best industry practices, such as those in the BICSI TDMM manuals and the NECA/BICSI 568-2006 standard.

14. All 4 pair cables shall be terminated on the jack and patch panels using T568-B wiring scheme.
15. Cables shall be neatly bundled and dressed to their respective patch panels or wiring blocks. Each panel or block shall be fed by an individual bundle separated and dressed back to the point of cable entrance into the rack or frame. Cable bundles must be neat, but should not be perfectly groomed to avoid potential "alien crosstalk" problems.

C. Open-Cable Installation:
1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend UTP cable not in a pathway, a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.
3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

D. Separation from EMI Sources:
1. Comply with BICSI TDMM and TIA-569-B recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
2. Provide the following minimum separation distances between pathways for copper communications cables and power wiring.
   a. For branch circuits of 5 kVA or less, a minimum physical separation of (2.5 in) between the communications cabling and power cabling is required. When power or communications cable, or both, are in enclosed grounded metal pathway (i.e. conduit), if it is not possible to keep the minimum separation distance for certain segments of the pathways, then the separation for those segments may be less if approved by the Owner prior to installation.
   b. Minimum separation from possible sources of electromagnetic interference exceeding 5kVA shall be as follows:

Condition	Minimum Separation
Unshielded power lines or electrical equipment in proximity to open or non-metal communications cabling pathways	24"
Unshielded power lines or electrical equipment in proximity to a grounded fully enclosed metal communications cabling pathway	12"
Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to a grounded fully enclosed metal communications cabling pathway.	6"
Electrical motors or transformers	47"

3. A minimum clearance of 5" from fluorescent fixtures must be maintained.

3.3 PATHWAYS AND SUPPORT INSTALLATION

A. Refer to Section 270500 "Common Work results for Communications".

B. Certain cable pathways might be provided by others. It is the responsibility of the vendor to notify the project team in writing of any pathway that is not provided.

C. Before installing cabling inspect all pathways installed by others including but not limited to conduit, cable trays and innerduct and promptly report any problems to the Owner.

D. Cable support hardware and its placement, tie wrapping practices, etc. must not degrade the physical, electrical, or optical characteristic of any of the installed cable types. Plenum spaces require plenum rated cable ties.

E. Velcro cable ties may be used in lieu of plastic cable ties.

F. Provide abrasion protection for any cable or wire bundles which pass through holes or across edges of sheet metal or punched metal studs.

G. Suspended cable runs (e.g. ceiling) must be supported at least every five (5) feet. Cable bundle size and weight must be well within the support manufacturer's specifications, and the support must be suited to the type of cable it is being used with. Suspended cable bundles must be tie wrapped at least every four (4) feet, but the ties must not be so tight as to crimp or deform the cable sheath. The distances between supports, between ties, or between supports and ties need not be exactly uniform, but for UTP copper cables, must exhibit some randomness to avoid potential electrical problems that can arise from a periodic cable deformation.

H. Where possible, route cables in overhead cable trays and inside wire management systems attached to the equipment cabinets and racks. Use

Velcro ties or ducts to restrain cabling installed outside of wire management systems on racks or in cabinets.

I. Cable pathways shall not be filled greater than the maximum fill for the particular raceway or cable tray type as per relevant sections of the applicable version of the National Electrical Code (NFPA-70) and the TIA-569-B standard.

J. A pull cord (nylon; 1/8" minimum) shall be co-installed with all cable installed in any conduit, where none exists and where it is practical to do so.

K. Cable, cable trays and support shall be installed above fire-sprinkler systems and shall not be attached to the sprinkler system or any ancillary equipment or hardware. The cable system and support hardware shall be installed so that it does not obscure any valves, fire alarm conduit, boxes, or other control devices.

L. Cables must not be laid on top of, or fastened to, such items as lighting fixtures, electrical machinery, ceiling grid, ceiling tiles, HVAC ducts, removable ceiling supports, conduits, sprinkler pipes, or other distribution pipes, but must be properly and independently supported above the ceiling as required by codes, standards, and good industry practice. The contractor shall install appropriate carriers to support the cabling. Steel, masonry, independent rods, independent support wires or other structural parts of the building shall be used for cable support attachment points up to the total weight for which the fastener is approved. Rods or wires that are employed for other functions (e.g. suspended ceiling grid support) shall not be utilized as attachment points.

M. UTP copper cables must be kept away from lighting fixtures, parallel runs of electrical cables and electrical conduits, and other potential sources of interference.

N. Cables run in the ceiling must be as high up as practical to avoid other services, but in no event lower than 3" above the ceiling grid, and in no case must they interfere with other services or the ability to lift, remove, or replace ceiling tiles.

O. All cables must follow prescribed pathways.

P. In areas with raised floors, cables must be supported and kept off the under floor.

Q. Any cables that penetrate raised floor must be protected with split loom tubing or bushings.

R. Cables routed from floor or column in-feeds to system furniture raceway shall be protected with spiral wrap, flexible plastic innerduct or similar means.

S. Clearance from sprinklers must be in accordance with applicable codes and/or AHJ requirements.

3.4 GROUNDING AND BONDING INSTALLATION

A. Refer to Section 270500 "Common Work results for Communications".

3.5 FIRESTOPPING INSTALLATION

A. Refer to Section 270500 "Common Work results for Communications".

3.6 IDENTIFICATION FOR COMMUNICATIONS SYSTEMS

A. Refer to Section 270500 "Common Work results for Communications".

B. All horizontal cables shall be labeled at both ends prior to termination. The labels should be typed or produced with a labeling making device and not hand written. Labels shall be installed between 6" and 12" from the cable termination point and placed in a visible location. In the telecom rooms, labels shall be placed between the cable bundle and the termination hardware. Cable IDs shall be visible and readable after cable installation is completed. If the cable is re-terminated resulting in the above condition not being met, a new label shall be generated and installed.

C. When the cable terminates within an enclosed housing, e.g. in a fiber patch cabinet, the cable must be labeled within 6"-12" of entering the termination housing.

D. All permanent labels must be durable and legible and suited for long term use in the environments in which they will be located. Labels must be machine created. Handwritten labels are unacceptable unless approved in writing by the Owner.

E. All cables, patch panels, punch down blocks, and other items specifically identified by the Owner must be fully labeled. The Owner will supply a document describing labeling requirements for most of these items. If the Vendor prefers, some variations from the specifics of these requirements may be allowed after consultation with, and written approval of the Owner. The requirements of the ANSI/TIA/EIA-606-A standard, subject to the Owner's approval, must be followed for items required to be labeled that are not addressed in detail by this specification or other documents provided by the Owner.

F. Cabling must be labeled within 12 inches of entry/exit of wall or floor penetrations or entry/exit into conduits that penetrate walls or floors. Depending on the length of the run, intermediate cable labels may be needed on open pathway cabling as well as on raceways and cable trays. Refer to construction documents for detail on labeling placement.

G. Ensure all labeling is included in the same manner as it was shown in the construction drawings and is accurate.

H. Labeling scheme for all communications systems is subject to prior approval by the Owner.

3.7 SOURCE QUALITY CONTROL

A. Upon receipt of the cable shipment at the project site, the Contractor shall be responsible for inspecting and testing the cables on the reels to verify and validate the manufacturer's factory testing certifications.

B. Factory test copper cables on reels according to TIA/EIA-568-B.1.

C. Factory test UTP cables according to TIA/EIA-568-B.2.

D. Cable will be considered defective if it does not pass tests and inspections.

E. Prepare and submit test and inspection reports.

3.8 FIELD QUALITY CONTROL

A. All testing of all equipment and cables shall be performed by a testing crew and foreman not previously involved in any way or form in this project.

B. Cable tests shall be performed utilizing the procedures documented herein on 100% of all installed cabling.

C. All testing procedures shall be performed in accordance with the manufacturers' recommended testing guidelines and the procedures specified herein. All cables shall be tested in accordance with this document, the ANSI/TIA/EIA standards, and best industry practice. If any of these are in conflict, the Contractor shall bring any discrepancies to the attention of the project team for clarification and resolution.

D. The Owner and its representatives shall have the right to inspect and monitor any or all of the field tests. Give the Owner a minimum of two-day notice before testing commences.

E. The Owner's representative shall have the right to request the testing crew to perform a 10% random testing to confirm and verify all testing results submitted.

F. This 10% testing shall be performed in the presence of the Owner or its duly authorized representative. This request will be given to the with two days prior notice and shall be performed at no additional cost to the Owner.

G. The Owner reserves the right to refuse payment for testing services if the 10% random test does not meet the Owner's criteria of a 95% match to the original test results. The Owner shall reserve the right to hire a third-party testing crew.

H. At its sole discretion, the Owner may choose to have all or part of the cabling installation re-tested by a suitably qualified third party (or parties) using test instruments and methods adhering to the same standards and limits that the Contractor must adhere to. Links failing these tests must be re-tested and any discrepancies resolved or repaired at Contractor's sole cost. This will not apply to links where both the original and re-tested measured values fall within the standards allowed measurement uncertainty range of the test instruments.

I. Tests and Inspections:

1. Visually inspect cable jacket materials for NRTL certification markings. Inspect cabling terminations in the Telecommunications room for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-B.1.
2. Visually confirm cable performance/category, marking of outlets, cover plates, outlet/connectors, and patch panels.
3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
4. Test all UTP copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.
5. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy

(Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

6. Perform Category 6 Permanent Link Test for all cables. In addition, test all the interconnect cables between the LAN switches and the interconnect field patch panels.

J. Procedures:

1. Test results and remediation will be required prior to move-in and may be requested prior to IDF room ready. The following testing schedule should be completed and submitted to the Owner and/or Owner's authorized representative at project commencement.

Infrastructure Type	Date
Horizontal Cabling (not including modular furniture)	No later than 3 weeks before move-in
Horizontal Cabling (only modular furniture)	No later than 2 weeks before move-in

2. No asterisk (*) test results will be accepted. These results shall be retested and submitted after a PASS is received. All cables and termination hardware shall be 100% tested for defects in installation and to verify cabling system performance under installed conditions according to the requirements of ANSI/TIA/EIA-568-B.2 and 568-C.0. Any defect in the cabling system installation including but not limited to cable, connectors, patch panels, and connector blocks shall be repaired or replaced in order to ensure 100% useable conductors in all cables installed.
3. All cables shall be tested in accordance with this document, the ANSI/TIA/EIA standards, and best industry practice. If any of these are in conflict, the Contractor shall bring any discrepancies to the attention of the project team for clarification and resolution.
4. Cables, jacks, connecting blocks, and patch panels shall be tested when in their final locations.
5. Labeling must be completed prior to testing to ensure that mislabeled outlets are identified during the testing process.
6. The Owner reserves the right to observe testing.
7. All tests must be performed by technicians with training in the methods that will be employed. The technicians must have field experience with the instruments that will be used for testing.
8. Test equipment must be in good working order and must have been calibrated within the time period specified by the manufacturer and to specified accuracy.
9. Where applicable, the testing instrument must utilize an appropriate test head.

10. The Contractor must identify the manufacturer and model of all test equipment to be used, and supply specifications if requested to do so by the Owner. The Owner reserves the right to reject the use of any equipment it deems inadequate.
11. Adapter cables and other accessories associated with test equipment must be of high quality and must not be degraded from use or improper storage.
12. Pass/Fail criteria for all UTP and optical fiber link tests must be based upon the limits contained in this specification, or if not stated, then upon the applicable portions of the ANSI/TIA 568-C and 568B.2 (and relevant addenda) group of standards cited in this specification covering the measured parameters for Cat 6A, CAT 6, CAT 5e, CAT 3 and optical fiber cables.
13. Links failing any test must be fixed and fully re-tested.

K. Unshielded Twisted Pair cable (4-pair) testing
1. Horizontal cabling shall be tested using an instrument certified compliant to ANSI/TIA/EIA-568-B.2-10 Level IV for Cat 6/6A;
2. UTP link parameters must be tested against their respective "Permanent Link" specification limits defined in the most current versions of the ANSI/TIA-568-C.0 and ANSI/TIA/EIA-568-B.2 standards and their relevant addenda including 568-B.2-1 and 568-B.2-10.
3. The following parameters must be included for all cable Categories:
    a. Wire Map (continuity, shorts, reversed pairs, split pairs, transposed pairs)
    b. Insertion Loss (each pair)
    c. Length (each pair)
    d. Propagation Delay (each pair)
    e. Delay Skew (worst case)
    f. NEXT (pair to pair) from each end of the link
4. Additionally, the following parameters must be included for Cat 5e, Cat 6 and Cat 6A testing:
    a. PSNEXT (each pair) from each end of the link
    b. ACRF (pair to pair) from each end of the link
    c. ACRN (pair to pair) from each end of the link
    d. PSACRF (pair to all other pairs) from each end of the link
    e. PSACRN (pair to all other pairs) from each end of the link
    f. Return Loss (each pair) from each end of the link
5. Category 6 and Category 6A links might be required to be tested for alien crosstalk parameters. If so, the conditions of test (e.g. the percentage of installed cables to test, which will be the victim and which the disturber cables) will be specified elsewhere, and the following parameters will have to be included:
6. PSANEXT from each end of the link
7. PSAACRF from each end of the link

8. The test instrument must be set for the correct Nominal Velocity of Propagation (NVP) of the specific Cat 6A, Cat 6, Cat 5e or Cat 3 cable being tested and not for a generic cable of the respective category.
9. Any failed test results that cannot be remedied through re-termination must be reported in writing to the Owner immediately, along with a copy of the test results.

L. `

1. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.
2. Test results must be recorded in the memory of the field test instrument (except for fiber length if this is derived from cable jacket markers) and then be transferred unaltered to a Windows PC using the recommended software from the manufacturer to output the test results into the formats detailed below.
3. Test results must be returned to the Owner and it's representatives in the following formats:

For Fluke testers	.flw and .pdf
For Agilent testers	.sdf or .mdb and .pdf

4. For UTP Permanent Links, all the parameters listed in this specification under the "Unshielded Twisted Pair cable (4-pair) testing" section must be included in the test results database and in the printed copy. The Nominal Velocity of Propagation (NVP) set in the test instrument for these measurements must be included as well.
5. Fiber optic links must show the measured attenuation values, as well as the limits against which they have been tested, and the link length in the database and in the printed copy.
6. As part of the testing documentation package the following information must also be included: date(s) of test, name(s) of test personnel, identification of field test instrument used including manufacturer, model and serial number, and date of most recent calibration of the test instrument.
7. Required UTP and fiber test results must be sent to the manufacturer in a timely manner so that they can validate the results and issue an extended warranty/guaranty certificate for the installation.

M. Close-Out Documentation

1. Provide the following (10) business days after the project has been handed over to the customer.
2. As-Built Drawings

a. These drawings must document all changes from the construction drawings
b. These drawings must add the routes of all backbone cables, backbone cable pathways and station cable trunks

3. Test Results as required in Section 2.09 "Reporting Test Results".
4. Copy of form submitted to manufacturer to obtain warranties for the horizontal and backbone systems.
5. The contractor must provide the following (30) business days after the project has been handed over to the Client.

END OF SECTION 27 15 00

SECTION 27 16 00 - COMMUNICATIONS CONNECTING CORDS, DEVICES AND ADAPTERS

PART 1 - GENERAL

1.1 SUMMARY

A. This section applies to cords, devices, and adapters that connect to a work area outlet (WAO), patch panel, wiring blocks, or other connection point in the cabling channel.

B. Provide Category 6/6A patch cords.

1.2 RELATED DOCUMENTS

A. Division 01 "General Requirements"

B. Division 27 Section "Common Work Results for Communications"

C. Division 27 Section "Communications Room Fittings"

D. Division 27 Section "Communications Horizontal Cabling"

E. Division 27 Section "Communications Backbone Cabling"

F. Division 27 Section "Commissioning of Communications"

1.3 DEFINITIONS

A. Refer to Division 27 Section "Common Works for Communications".

1.4 SUBMITTALS

A. Refer to Division 27 Section "Common Work Results for Communications".

1.5 QUALITY ASSURANCE

A. Refer to Division 27 Section "Common Works for Communications".

1.6 COORDINATION

A. Refer to Division 27 Section "Common Works for Communications".

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide product by one of the following manufacturers:

1. Panduit/General Cable
2. Leviton/Berk-Tek
3. Ortronics/Superior Essex
4. Or approved equal

2.2 PATCH CORDS

A. UTP Patch Cords

1. 100-ohm, 4-pair UTP stranded core patch cords with modular RJ45 style connectors.
    a. Category 6/6A UTP performance
    b. Wiring: T568B
    c. Small overall cable diameter (max 0.2 in.)
2. Used:
    a. To connect the end-user devices to the work area outlet (WAO).
    b. To cross connect the station field to the LAN switches in the IT Room.
    c. To cross-connect the security wall field and rack mounted NVRs and to the network equipment.
    d. To cross-connect the copper LAN equipment to the service provider's equipment at the Telco Demarcation Point.
3. Mechanical and transmission shall meet or exceed:
    a. ICEA S-90-661 for mechanical properties.
    b. TIA/EIA-568-B.2 for performance specifications.
4. Colors:
    a. Colors for patch cords at the workstation end to be coordinated/approved by Architect.
    b. Colors for patch corda at the IT Room end to be coordinated/approved via submittals.
5. Lengths:
    a. 9-foot cords for offices and workstations outlets.
    b. 5 and 7-foot cords for WAPs, cameras and other ceiling mounted outlets.
    c. 15-foot or 25-foot cords to connect the wall mounted security panels to the rack mounted network switches. Length to be confirmed in the field.
    d. 10-foot cords for the IT Room.
    e. Lengths to be coordinated with Owner's Representative before ordering.
6. Provide:
    a. Two (2) cords for each standard outlet, (1) at the IT Room and (1) at workstation end.
    b. For AV outlets, provide a number of patch cords equal to the number of ports at the IDF end and the same number at the outlet end.
    c. Two (2) cords, one at each end, for each camera and WAP outlet.
    d. Six (6) cords in each IDF, three at each end, for network equipment tie to service provider's equipment.
    e. Provide 5% spare cords.
    f. Plenum rated cords shall be provided for ceiling mounted cameras, WAPs and for all outlets installed in plenum spaces.

PART 3 - EXECUTION

3.1 GENERAL

A. Patch cords must not be longer than required to minimize the amount of slack that has to be managed. Cords must be carefully and neatly installed, with attention given to bend radius and other factors affecting performance. Bend radius limits of fiber optic cords must not be violated. Cord installation must adhere to the manufacturer's requirements and to the requirements of applicable standards.

B. Route cords from the patch panel to the vertical managers on each side of the rack. Route cords from the left vertical manager via the horizontal manager to the right side of chassis switches. The cords from each switch blade (48-port) shall be bundled together.

C. Velcro and other cable management shall be no more than hand tightened and shall fit snugly, but not compress, crimp, or otherwise change the physical characteristics of the cable jacket or distort the placement of twisted-pair components. Any cable exhibiting stresses due to over tightening of cable management devices must be replaced at no cost to the Owner.

D. Where possible, route cables in overhead cable trays and inside wire management systems attached to the equipment cabinets and racks. Use Velcro or ducts to restrain cabling installed outside of wire management systems on racks or in cabinets.

E. Any cable damaged or exceeding recommended installation parameters

F. Install patch cords and in the IT room and at the outlet end. Provide unit pricing for each length on the material and labor pricing sheet.

G. Patch cords must not block access to power supplies and fan units (as applicable) that might need replacement network hardware.

H. Patch cords, work area cords, and equipment connection cords must utilize the same cable as the link with which they are being employed. For cables recognized under the ANSI/TIA/EIA-568-C group of standards, they must be of the same (or better) Category and must meet all relevant requirements of these standards, including other required standards cited within them.

I. Cords must be factory and not field terminated.

J. Patch cables must be color coded for function per requirements to be coordinate with the Owner's Representative.

K. Static must be discharged from cables before patching them to equipment ports.

3.2 LABELING

A. All permanent labels must be durable and legible and suited for long term use in the environments in which they will be located. Labels must be machine created. Handwritten labels are unacceptable unless approved in writing by the Owner.

B. All patch cords/jumpers and other items specifically identified by the Owner's representative must be fully labeled. The requirements of the ANSI/TIA/EIA-606-A standard, subject to the Owners approval, must be followed for items required to be labeled that are not addressed in detail by this specification or other documents provided.

C. Ensure all labeling is included in the same manner as it was shown in the construction drawings and is accurate.

END OF SECTION 27 16 00

SECTION 28 05 00 - COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included:
   1. Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
      a. Grounding and bonding for Electronic Safety and Security (ESS).
      b. Pathways for ESS.
      c. Lightning and Surge Protection for ESS.
      d. Vibration and Seismic Controls for ESS.
      e. Equipment Enclosures for ESS.
      f. Electronic Components for ESS.
      g. Exposed Components.
      h. Cables for ESS.
      i. Identification for ESS.
      j. Electronic Safety and Security (ESS) equipment coordination and installation.
   2. The Electronic Security Systems shall include, but are not limited to the following:
      a. Intrusion Detection System (IDS)
      b. Video Surveillance System (VSS)
      c. Associated cabling, enclosures and uninterruptible power supplies.
      d. Coordination:
         1) Coordination with electrical for power and pathways
         2) Coordination with telecommunications for camera and other IP equipment connections
         3) Coordination with Owner for owner furnished items and Local Area Network requirements
   3. Pricing:
      a. Base Bid
         1) Submit the total cost for a complete installation of the security systems as described in the security drawings and specifications documents.
      b. Unit Pricing
         1) Submit unit pricing for all major components of each system for the addition or deletion those components.
         2) Unit pricing shall include material and labor to furnish, install test, integrate into the system and provide the required as-built documentation.
         3) Submit units pricing for each system components, including, but not limited to:

4) Video Surveillance: wide angle camera, corridor view camera, other components as needed.
5) Intrusion Detection: motion sensors, glass break sensors, door contacts, keypads, control panels, other components, as needed.

1.2 RELATED DOCUMENTS

A. Division 01 "General Requirements"

B. Division 26 Section "Grounding and Bonding for Electrical Systems"

C. Division 26 Section "Raceway and Boxes for Electrical Systems"

D. Division 26 Section "Surge Protection for Low Voltage Electrical Power Circuits"

E. Division 27 Section "Communications Horizontal Cabling"

F. Division 27 Section "Communications Equipment Room Fittings"

G. Division 28 Section "Electronic Surveillance"

H. Division 28 Section " Access Control and Intrusion Detection"

1.3 ABREVIATIONS AND DEFINITIONS

A. Abbreviations

AFF	Above Finished Floor
ANSI	American National Standards Institute
AWG	American Wire Gauge
EIA	Electronic Industries Alliance
ESS	Electronic Safety and Security
FCC	Federal Communications Commission
Fps	frames per second
IP	Internet Protocol
LAN	Local Area Network
Mbps	Megabits per second
MHz	Megahertz
NIC	Network Interface Card
NVR	Network Video Recorder
RU	Rack Unit (1.75")
RAID	Redundant Array of Independent Disks
SCS	Structured Cabling System
TB	Terra Bytes
TCP/IP	Transmission Control Protocol / Internet Protocol
UL	Underwriters Laboratories
UPS	Uninterrupted Power Supply
UTP	Unshielded Twisted Pair

VSS Video Surveillance System
WAN Wide Area Network

B. Definitions
   1. "Provide" shall mean furnish and install.
   2. "Work" shall mean all labor, materials, equipment, apparatus, controls, accessories, and all other items required for a proper and complete installation.
   3. "Concealed" shall mean hidden from sight in chases, furred spaces, shafts, embedded in construction or in crawl space.
   4. "Exposed" shall mean not installed underground or concealed as defined above.
   5. "Furnished by others" shall mean materials or equipment purchased and set in place under other sections of the general contract and connected to the systems covered by this section of the specifications by this trade contractor.
   6. "Coordinate" shall mean all work provided under this section of the specification shall be in compliance with work of other trades.
   7. "Demonstration" shall mean the verification by operation, movement or adjustment of an item or system and the comparison of the item or system performance against a qualitative standard or standards as set forth in the specific requirements of the cited paragraph.
   8. "Test" implies the systematic exercising of an item or system under all specified conditions with quantitative measurement of specified parameters and comparison of performance against the quantitative standards set forth. The Security Contractor shall pre-test/pre-commission the installed system before the Owner' Representatives shall test the system. It is the Security Contractors responsibility to provide sign-off sheets to the Owner's' Representatives certifying that the system is ready for testing and commissioning.
   9. Base Design/System: The intent of this phrase(s) is to describe the security systems specified herein, without regard or reference to the alternates appended to this document. The base design and base system present minimum acceptable performance levels and the Owner's' desire to provide priority consideration to the most economic security system that meets these performance levels.
   10. Security Contractor: This term designates the company which conducts the Work and is responsible to ensure that others provide specified Work as described in the Specifications for security systems. This term specifically refers to a company that is qualified to perform the Work specified herein related to the integration of all electronic security access control systems and components and the fabrication and installation of all security equipment.
   11. Electrical Contractor: The Electrical Contractor shall furnish and install all security system interconnecting conduits, junction boxes, outlet boxes, electrical troughs, cable ladders, plywood backboard and other associates mounting hardware. Interconnecting security conduits shall be

installed with a nylon pull string inside the conduits for installation of interconnecting conductors. In addition, the Electrical Contractor shall install the electrical power for the security system. The Electrical Contractor shall refer to the electrical drawings and electrical specifications for installation requirements.

12. Door/Frame Security Hardware Package: This term signifies the security hardware package associated with a security alarm monitored door.

1.4 STANDARDS AND CODES

A. Ensure that the design and fabrication of the equipment is in accordance with applicable engineering codes and standards. When specific requirements are stated in this Section that exceed and/or overlap those requirements of the codes and standards referenced here, this Section shall govern.

B. Ensure compliance with all applicable prevailing codes and laws within the jurisdiction of the site as applicable to the extent of this section.

C. Provide a complete fully operational turnkey security system as specified within these documents.

D. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The most current version of the following standards shall be referenced.

1. American National Standards Institute (ANSI) Publications:
   a. National Electrical Safety Code
2. American Society for Testing and Materials (ASTM) Publications:
   a. Standard Practice for Security Engineering Symbols
3. National Fire Protection Association (NFPA) Publications:
   a. National Electrical Code
4. National Electrical Manufacturers Association (NEMA) Publications:
   a. Industrial Control Devices and Assemblies.
   b. Enclosures for Industrial Controls and Systems
   c. Enclosures for Industrial Controls and Systems
   d. Enclosures for Electrical Equipment
5. Underwriters Laboratories, Inc., Standard for Safety:
   a. UL 5 Surface Metal Raceways and Fittings
   b. UL 6 Rigid Metal Conduit
   c. UL 50 Cabinets and Boxes
   d. UL 65 Electric Wired Cabinets
   e. UL 444 Communication Cables
   f. UL 497B - Protectors for Data Communication and Fire Alarm Circuits
   g. UL 514B Boxes, Fittings for Conduit and Outlets
   h. UL 603 Power Supplies For Use With Burglar-Alarm Systems
   i. UL 609 Local Burglar Alarm Units and Systems
   j. UL 611 Central-Station Burglar-Alarm Systems
   k. UL 632 Electrically Actuated Transmitters
   l. UL 634 Connectors and Switches For Use With Burglar Alarms Systems
   m. UL 639 Intrusion Detection Units

n. UL 651 Conduit, Schedule 40' and 80' Rigid PVC
o. UL 796 Electrical Printed Wiring Boards
p. UL 797 Electrical Metallic Tubing
q. UL 1076 Proprietary Burglar Alarm Units and Systems
r. UL 1773 Boxes, Termination

6. Applicable Federal, state and local laws, regulations, ordinances and codes.
7. Nothing in this Section, including revocation of certain specific codes, standards or specifications, shall relieve the Security Contractor of the responsibility for compliance with the codes, standards or specifications which are generally recognized to be applicable to the Work specified herein.

1.5 SUBMITTALS

A. General Procedures

1. All submittals shall comply with the requirements of Division 01.
2. Do not commence work that requires review of any submittals until receipt of returned submittals with appropriate final action.
3. Submittals that deviate from the procedures outlined herein will be rejected. No allowance or extension of project time will be considered due to lost time associated with procedural deviation.
4. Do not submit substitute items that have not been approved.
5. Preparation and Transmittal of Submittals:
6. Transmit each submittal with a transmittal form. Submittals received without a transmittal form may be returned without action. The transmittal form shall include: project name and address, number and date of submittal, name and address of the issuing entity.
   a. Sign or initial each copy of each submittal to certify compliance with requirements of the Contract Documents.
   b. Submittals shall include a Table of Contents listing all items included and relevant references to contract documents. For product data sheets the table of contents shall include: product name and manufacturer, page number of the corresponding specification section.
   c. Product data sheets shall be grouped according to the specifications sections. Submittals shall include relevant information only. Product being submitted shall be clearly identified.
7. Timing of Submittals
   a. Prepare and transmit each submittal requiring approval sufficiently in advance of scheduled performance of the related work to allow for adequate review and processing time, including time for re-submittal if necessary.
   b. If processing time for a particular submittal will be critical to progress of the work, advise and notify the Owner or its representatives accordingly.
8. Grouping of Submittals

a. Group related submittals as required to allow for proper review and evaluation. Example: product data sheets shall be submitted together with shop drawings.

B. List of Submittals:
   1. Pre-Construction Submittals:
      a. Qualifications and Certificates
      b. Materials and Equipment List
      c. Product Data for every product installed
      d. Manufacturer Quality Assurance Tests and Source Quality Control Reports
      e. Shop drawings
      f. Samples
   2. During Construction:
      a. Coordination Drawings
      b. System Labeling
   3. Post Construction:
      a. Test Plan and Procedures
      b. Field Quality Control Reports/Test Results
      c. Record (as-built) Drawings
      d. Spare Parts List
      e. Manuals
      f. Maintenance Support
      g. Warranties

C. Qualifications and Certificates
   1. Installer Qualifications:
      a. Qualification Data: The work specified herein shall be performed by a qualified installer, as defined and described herein.
      b. Installer shall be certified installer for the specific manufacturers and systems provided.

D. Materials and Equipment List:
   1. Complete list of all materials, equipment and accessories proposed for his Work. This list shall include manufacturers, complete catalog identification numbers and model or system designator, quantities, options, product data as described below, basic system architectural block diagrams, and CPU software operating features.
   2. The submittal shall be in sufficient detail so that the equipment and materials proposed can be readily identified.
   3. Submittal of partial lists is not acceptable.

E. Product Data:
   1. For each type of product indicated.
   2. Shall be ordered by specifications section. Each product data shall reference the appropriate section and subsection.
   3. Collect Product Data into a single submittal for each element of construction or system.
   4. Include construction details, material descriptions, dimensions of individual components and profiles, and standard colors and finishes. Include rated

capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories. Is shall also include roughing-in diagrams and templates, standard wiring diagrams, controls and performance curves. Where Product Data must be specially prepared or modified because standard printed data is not suitable for use, submit as "Shop Drawings".

5. Clearly mark each copy to identify pertinent products, models, and accessories. Show performance characteristics and capacities. Show dimensions and clearances required. Include the following information:
   a. Reference to appropriate specification section and subsection.
   b. Compliance with recognized trade association standards.
   c. Compliance with recognized testing agency standards.
   d. Application of testing agency labels and seals.
   e. Notation of dimensions verified by field measurement.
   f. Notation of coordination requirements.
   g. Manufacturer's printed recommendations.

F. Samples: Along with project data and shop drawings, submit one (1) sample for each exposed security devices and security devices with color and finish options, for review by the Architect. The Owner's' Representatives/Architect shall retain these devices as record of the approved equipment for the length of the project.

G. Shop Drawings:
   1. The shop drawing submittals shall include highly detailed, to-scale, drawings describing the products (systems, equipment, devices and materials) and services as to precise locations, mounting and installation methods, details and dimensions, schedules, conduit sizing, conduit routing, riser diagrams, point-to-point interconnect diagrams, equipment schedules, zoning schedule, door schedules, VSS camera schedules, system interface schedules or diagrams, power requirement schedules, stand-by/emergency power schedule, cost reports, and such other diagrammatic or written descriptions which shall allow a thorough and accurate understanding of the security systems and equipment that are being furnished, how they are intended to function, how they will be installed, and all other necessary information of similar intent.
   2. Indicate, among other requirements noted herein, the accurate locations of all conduit, raceway, junction and utility boxes, termination panels, transformers (if any), power supplies, panels, and all other equipment noted.
   3. Clearly illustrate all mounting locations and methods, with particular detail for the installation of intrusion sensors and the mounting of interior and exterior VSS cameras. While some drawing details may be "typical," the shop drawings shall illustrate the installation detail of each unique application.
   4. Include plans, elevations, sections, details, and attachments to other work.

5. Equipment schedules and details shall provide the following information, as appropriate in each case: door number; door type; door position switch;; VSS camera number activated by sensor or switch closure; input/output programming schedules; CPU output reports structure.
6. Camera schedules and details shall provide the following information: camera number; camera type; monitor number for each camera (if any); sequencing (if any); camera model number; camera features, such as auto-iris; lens specification; power requirements; type of power input; cable type; length of cable run; camera mounts; camera housing; camera housing features, such as heater, etc.; camera drives; switcher position; switcher type; monitor type; cameras displayed on each monitor, especially linked displays; NVR positions; alarm queuing; special installation or carpentry requirements; camera and/or lens controls; alarm homing; termination method; lightning, ground loop, etc. protection.
7. Clearly illustrate the fields of view of each camera, as well as "park" positions for panning and zooming cameras (if any). If the camera is capable of wide-angle and telephoto viewing, both fields of view shall be indicated. The installer's "aiming point" shall be indicated. The submittal shall clearly identify outdoor cameras mounting details and maintenance access concepts and design.
8. System interface schedules or diagrams shall clearly identify: sensors and switches which queue cameras, as well as the number of camera activated; NVR activation logic; VSS monitor switching logic.
9. Equipment Racks and Cabinets: Include workspace requirements and access for cable connections.
10. Exposed equipment: Submit one (1) sample for each exposed security devices and security devices with color and finish options, for review by the Engineer and Architect. The Engineer/Architect shall retain these devices as record of the approved equipment for the length of the project.
11. Grounding: Indicate location of grounding bus bar and its mounting detail showing standoff insulators and wall mounting brackets.

H. System labeling: submit labeling scheme and samples.

I. All post construction submittals must be presented and approved prior to final acceptance.

J. Formal Test Plan and Procedures: 30 days prior to acceptance testing and final inspection, submit a formal test plan and test procedures.

K. Spare Parts and Components List: At the conclusion of the work, submit a complete list of manufacturers' recommended spare parts and components required in order to satisfactorily maintain and service the systems for a minimum of two years.

L. Manuals:
1. Prior to final acceptance, complete sets of Operation and Maintenance Manuals shall be submitted for systems and equipment provided under this contract in PDF and one (1) hard copy.

2. The manuals shall be compiled, assembled and indexed, in an easily identifiable hard cover form.
3. The manuals shall include the following:
    a. Complete operating instructions.
    b. Complete maintenance instructions, wiring diagrams, troubleshooting instructions.
    c. System service instructions for work which manufacturers recommend user service.
    d. Complete parts lists for each major item of equipment and/or for each system.
    e. Complete collection of manufacturers' product and catalog literature for equipment and systems installed under this contract.
    f. Manufacturers' warranties.
    g. Operating characteristics, performance data, ratings, and manufacturers' specifications for each item of equipment or system.
    h. Where practical, internal wiring diagrams and schematics.
    i. Name, address, and telephone number for service for each item of equipment or system.
    j. Software User Documentation: Manual shall include operating instructions, programming instructions, technical documentation and maintenance procedures to permit making changes to system configuration.

M. Record Drawings
1. Produce and keep up-to-date, a complete record as-built set of prints (black-line bonds) which shall be corrected and marked-up to show every change from the original Specifications and Contract Drawings through final acceptance. This set of drawings shall be protected against soiling, tears, and similar damage and defacement. This set shall be kept on the job site and shall be used only as a record set.
2. Upon completion of the work produce and submit a final set of record drawings by updating the AutoCAD files of the construction set of drawings (to be provided by the Owner) with the information from the as-built set. The submittal shall include the original record set of black-bonds and the electronic files of the as-built drawings in both AutoCAD format and PDF format.

N. Service/Maintenance Support
1. Maintenance and repair of the system (parts and labor) shall be free of charge during the warranty period, including repair of workmanship defects. Free software upgrades during the warranty period.
2. Extended service/maintenance agreements for up to four (4) years after the warranty expires shall be available. Shall be renewable monthly, quarterly or yearly. Pricing for maintenance and service agreement shall be provided upon Owner's request.

O. Warranties
1. All components, parts and assemblies supplied as part of this scope of work shall be warranted against defects in material and workmanship for

a period of at least twelve (12) months (parts and labor), commencing upon the date of acceptance by Owner.

2. Execute a written guarantee (warranty) to the Owner certifying that all the contract requirements have been completed in accordance to the final Specifications and Contract Drawings and warranting all materials and equipment furnished by him under this contract to remain in satisfactory operating condition (ordinary wear and tear, abuse and causes beyond his control for this Work excepted) for a period of one (1) year from the date of final acceptance or beneficial use, whichever is later.
3. All defects or damages due to faulty materials or workmanship shall be repaired or replaced.
4. Provide four (4) periodic inspections at no cost to the Owner during the warranty period.

P. Definition of Acceptance

1. The Owner acceptance of the installation will be based upon satisfactory performance during a thirty (30) day period of beneficial use beginning after all of the other acceptance requirements listed below have been satisfied in full by the Owner.
2. Acceptance of the installation will be reasonably and good faith determined by the Owner or its agents. Partial use of the installation prior to completion will not be considered as contributing in part or in whole to the thirty-day period. Problems discovered during the thirty (30) day period covered under the responsibilities of the Vendor must be fixed at no cost to the Owner.
3. Acceptance will not be given, until all problems have been fixed to the Owners' full satisfaction. Acceptance does not absolve the installer from any of its obligations under warranties and guarantees. The other acceptance criteria are the following:
    a. All tests have been passed and all required test results have been submitted in appropriate format and have been accepted.
    b. All required documentation has been submitted.
    c. All required labeling has been completed.
    d. All work has been completed as required by the specifications, including all cable runs and pathways in their permanent places, and all cabinets, racks and cable pathways (i.e. ladder, tray, etc.) secured.
    e. All Punch List items have been completed.
    f. All warranties for the installation have been obtained by installer.
    g. The Security Contractor has submitted written notification that the installation is completed and that all specification requirements have been met.

1.6 SUBSTITUTIONS, DEVIATIONS AND CHANGES

A. Substitutions

1. Requests for substitution are permitted for materials specified with an "or approved equivalent" clause or other language of same effect in the Contract Documents.

B. Deviations
   1. Any deviations or changes involving extra work are not permissible without prior review and written approval by the Owner or its duly authorized representative.

C. Changes
   1. All work described in Contract Riders shall follow the methods, requirements and general arrangement of this Specification unless otherwise noted.

1.7 TRAINING

A. Upon completion of the installation, provide on-site training in the complete operation of the system.

B. Engage factory-authorized service representatives to train Owner's' personnel to adjust, operate, and maintain security access systems.

C. The following establishes basic and minimum training requirements: Provide technical services and materials to instruct operators, maintenance persons, and programmers/database set-up personnel to operate, maintain and program the system.

D. Provide minimum six (6) hours onsite training for the video surveillance and (4) for the intrusion detection system, which shall include training in the proper installation and programming of all related hardware and software and include training of the department end-user.

E. Training of operators & maintenance personnel:
   1. Train up to 8 personnel. The instruction shall be provided by a competent factory trained engineer or professional instructor (that has completed manufacturer's training). Self-study or self-paced courses are not acceptable.
   2. Provide each trainee with complete, printed operating instructions and a brief sub system description in manual or handbook form. Training manuals shall be delivered for each trainee with two additional copies delivered for archiving at the project site. The manuals shall include an agenda, defined objectives for each lesson, and a detailed description of the subject matter for each lesson.
   3. Include training in preventative maintenance of equipment.
   4. Certification of successful operators shall be provided upon the completion of training. Certification shall consist of correspondence drafted on the Security Contractor's Company Letterhead stating that Owner's' staff has been trained in accordance with the contract documents and manufacturers standards and are fully proficient in the operation of the newly installed Security System.

F. A training day is defined as 8 hours of classroom instruction, including two 15-minute breaks and excluding lunchtime, Monday through Friday, during the daytime shift in effect at the training facility. For guidance in planning the

required instruction, the Security Contractor should assume that attendees will have a high school education or equivalent and are familiar with the facility. Approval of the planned training schedule shall be obtained from the Owner at least 10 days prior to the training.

1.8 QUALITY ASSURANCE

A. Unless otherwise specifically noted, all equipment, material and articles to be installed shall be new, best of their respective kinds, free from defects, listed by Underwriter's Laboratories for the intended use, bearing their label and of the most suitable grade for the purpose intended.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Grounding: Comply with ANSI-J-STD-607-A.

D. Modularity: Provide components designed for modular increase or decrease of system capability by installation or removal of plug-in modules. System components shall be designed to facilitate modular subassembly and part replacement.

E. Reliability: Provide only new, unused components free from flaws or imperfections, which are in current manufacturing production. Components shall be manufactured to meet all the requirements specified herein and shall be free from characteristics or defects which affect the appearance or which might affect the serviceability or render the equipment unsuitable for the intended purpose. The workmanship shall be of superior quality. The MTBF for any sensor component shall not be less than five-thousand (5000) hours. Provide components designed for continuous operation. Electronic components of the system shall be of the solid-state type, mounted on printed circuit boards conforming to UL seven-hundred-ninety-six (UL-796). Boards shall be plug-in, quick-disconnect type. Circuitry shall not be so densely placed as to impede maintenance. Power-dissipating components shall incorporate safety margins of not less than twenty-five (25) percent with respect to dissipation ratings, maximum voltages, and current-carrying capacity. Light duty relays and similar switching devices shall be solid-state type or hermetically sealed electro-mechanical type.

F. Maintainability: The components shall be capable of being maintained using commercially available standard tools and equipment. Components shall be so arranged and assembled that they are readily accessible to maintenance personnel without compromising the defeat resistance of the various ESS subsystems.

G. Availability: Provide products and services available within the project schedule established for this scope of work.

1.9 PROJECT CONDITIONS

A. Where required by local code, trade harmony shall be observed by using only approved union based installation workforce. Coordinate with the Owner or its authorized representatives.

1.10 COORDINATION

A. Coordinate layout and installation of security equipment in the telecommunications rooms, copper and/or fiber backbone and LAN requirements with the Owner and the Structured Cabling System (SCS) installer.

B. Meet jointly with Owner to exchange information and agree on details of equipment arrangements and installation interfaces.Record agreements reached in meetings and distribute them to other participants.

C. Coordinate location of power raceways and receptacles with locations of security equipment requiring electrical power to operate.

D. Coordinate arrangement, mounting, and support of electronic safety and security equipment:
   1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
   2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
   3. To allow right of way for piping and conduit installed at required slope.
   4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

E. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

F. Coordinate sleeve selection and application with selection and application of firestopping specified in the Electrical Section.

G. Coordinate routing of the security cables with the other trades.

H. Coordinate with electrical installation of the fire alarm system relays at each lock power supply location.
   1. Security Contractor responsibilities:
      a. Shall install all door monitoring contacts. Devices shall be retrofitted to the exiting doors, as specified on the drawings.
      b. Shall furnish and install termination cabinet furnished with screw-type termination block(s). The termination block(s) shall include additional screw terminals to accept the wiring interconnect inputs from the card reader(s), request-to-exit passive infrared detectors and/or the request-to-exit push button switch, and shunt switch, as required, which are not part of the door/frame security hardware package.
      c. Shall coordinate with the Electrical Contractor who will be providing all hi-voltage power to security equipment ad required, including but not limited to, the types and sizes of interconnecting wiring, outlet box sizes, electrical contacts needed and screw terminal sizes.
      d. Shall coordinate with Telecommunications Contractor who will be providing data connections for the cameras, control panels, servers, workstations and any other security equipment that requires data or telephone connectivity.
      e. Shall coordinate with the Owner who will be providing the Local Area Network (LAN) switches and wireless access points (WAPs).

2. Electrical Contractor responsibilities:
    a. Shall furnish, install and final connect all security door conduits and interconnect wires from door power supply and termination cabinet and/or junction box to all security devices associated with a door/frame security door location.
    b. Shall furnish and install all other security system interconnecting conduits, junction boxes, outlet boxes, electrical troughs, and other associated mounting hardware. Interconnecting security conduits shall be installed with a nylon pull string inside the conduits for installation of interconnecting conductors.

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING FOR SECURITY SYSTEMS

A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.

B. Comply with ANSI-J-STD-607-A.

2.2 PATHWAYS FOR ELECTRONIC SAFETY AND SECURITY

A. Hangers and Supports
    1. Cable Support: NRTL labeled.
    2. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.
    3. Cable hangers and non-continuous supports shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Cable tie slots fasten cable ties to brackets.
    4. Shall have various attachment options for: wall, ceiling, joist, beam, flange, raised floor pedestal and others type of mounting.
    5. Support brackets with cable tie slots for fastening cable ties to brackets.
    6. Lacing bars, spools, J-hooks, and D-rings, straps and other devices.
    7. Cable straps (ties) shall be reusable Velcro-style with hook and loop or d-ring, available in various colors and sizes. Plenum rated straps shall be used in plenum spaces.
    8. Plenum rated hangers and support shall be used in all plenum spaces.

B. Conduits and Back Boxes:
    1. Provide where indicated on drawings or as required.
    2. Conduit and boxes sizes as shown on the communications drawings.
    3. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems."
    4. Flexible metal conduit shall not be used unless specifically noted.

C. Sleeves for Pathways and Cables
    1. Refer to Division 26 “Electrical”.

D. Sleeve Seals and Firestopping
    1. Install to seal exterior wall penetrations.
    2. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway

or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal

3. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.

E. Grout

1. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

2.3 LIGHTING AND SURGE PROTECTION

A. Intrusion detection, video circuitry, and communication circuits that connect to outdoor mounted equipment shall be protected at both ends against excessive voltages.

B. This requirement shall apply for circuits that are routed both in underground conduits and overhead runs. As a minimum, both primary detection devices, such as three (3) electrode gas-type surge arrestor, and secondary protectors shall be installed to reduce dangerous voltages to levels that will cause no damage. Fuses shall not be permitted as lightning and power surge protection devices.

C. Provide fail-safe gas tube type surge arrestors on all exposed security data circuits. Breakdown voltage for the unit shall be three-hundred to five-hundred (300-500) VDC. The unit shall have equal performance for bi-polar operation with an automatic reset feature, and a minimum life of one thousand (1000) surges with ten (10) times one-thousand (1000) microsecond wave-form at one-thousand (1000) amperes.

2.4 VIBRATION AND SEISMIC CONTROLS FOR ESS

A. Security systems components shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. The term "withstand" means "the unit will remain in place without separation from any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event".

C. Equipment shall be seismically rated and braced according to IBC 1621.

2.5 IDENTIFICATION FOR SECURITY ESS

A. The identification for the communications systems shall meet all the requirements of a Class 3 facility as defined by ANSI/TIA/EIA 606-A, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.

B. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

C. Identify all the components of the security systems.

D. For fire-resistant plywood, do not paint over manufacturer's label.

E. All labels shall be preprinted or computer-printed type.

F. Type, format, wording, printing, and placement of labels shall be coordinated with Owner's' existing administration plan

G. Labeling System

1. PC-based software, WINDOWS compatible, capable of supporting alpha numeric characters and Windows True Type Fonts.
2. Compatible with laser printers.
3. Label sizes supported:
4. Minimum: 0.8" W x 0.2" H.
5. Maximum: 3.0" W x 12.0" H.

2.6 EQUIPMENT ENCLOSURES FOR ESS

A. Cabinets or housings, power supply enclosures, terminal cabinets, multiplexer, data gathering panels, wiring gutters, and other component housings, collectively referred to as enclosures, shall be so formed and assembled as to be sturdy and rigid.

B. Thickness of metal in cast and sheet metal enclosures of all types shall not be less than those in Tables I and II, UL six-hundred-eleven (UL-611). Sheet steel used in fabrication of enclosures shall be not less than fourteen (14) gauge. Doors and covers shall be flanged. Where doors are mounted on hinges with exposed pins, the hinges shall be of the tight pin type, or the ends of hinge pins shall be tack welded to prevent ready removal. Doors having a latch edge length of less that twenty-four (24) inches shall be provided with a single lock. Where the latch edge of a hinged door is twenty-four (24) inches or more in length, the door shall be provided with a three (3)-point latching device with lock; or alternatively with two (2) locks, one (1) located near each end.

C. Any ventilator openings in enclosures and cabinets shall conform to the requirements of UL six-hundred-eleven (UL-611).

D. Unless otherwise indicated, sheet metal enclosures, excluding control console enclosures, shall be designed for wall mounting with top holes slotted. Mounting holes shall be in positions which remain accessible when all major operating components are in place and the door is open but shall be inaccessible when the door is closed. Covers of pull and junction boxes provided to facilitate initial installation of the system shall be held in place by tack welding, brazing, or one-way screws. Zinc labels shall be affixed to such boxes indicating they contain no connections. These labels shall not indicate that the box is part of the security system.

E. Excluding the cabinets and other enclosures located in Security or Telecommunications Rooms, all enclosures, cabinets, housings, boxes, raceways, and fittings of every description having hinged doors or removable cover plates which contain circuits of the security system and its power supplies, shall be provided with cover-operated corrosion-resistant tamper switches, arranged to initiate an alarm signal when the door is moved as little as one quarter (1/4) inch from its normally closed position.

2.7 EXPOSED COMPONENTS

A. Components exposed and accessible to the public shall be of a design and construction typical and suitable for such use. All device fasteners shall be an approved security type. All components and materials shall be resistant to vandalism and waterproof.

B. Colors and finishes and mounting details of all exposed components shall be approved by Architect via submittals.

2.8 ELECTRONIC COMPONENTS FOR ESS

A. All electronic components of the system shall be of the solid-state type, mounted on printed circuit boards conforming to UL seven-hundred-ninety-six (UL 796). Boards shall be plug-in, quick-disconnect type. Circuitry shall not be so densely placed as to impede maintenance. All power dissipating components shall incorporate safety margins of not less than twenty-five (25) percent with respect to dissipation ratings, maximum voltages, and current-carrying capacity. All electronic printed circuit boards furnished and installed shall be provided with a mildew/fungus-resistant and moisture inhibiting coating.

2.9 CABLES FOR ESS

A. Provide NFPA 70, Type CM or CMP, as required. All cables installed in plenum spaces shall be plenum rated.

B. Category 6 cables for cameras, control panels, intercom, and other IP based equipment provided as part of Division 27 Communications. Coordinate location and mounting details with the communications contractor.

C. RS-232 Cable: Paired, 2 pairs, No. 22 AWG, stranded (7x30) tinned copper conductors, polypropylene insulation, and individual aluminum foil-polyester tape shielded pairs with 100 percent shield coverage; Pairs are cabled on common axis with No. 24 AWG, stranded (7x32) tinned copper drain wire.

D. RS-485 Cable: Paired, 2 pairs, twisted, No. 22 AWG, stranded (7x30) tinned copper conductors, with a distance limitation of 4000 feet.

E. Multi-conductor, Wiegand Keypads Cables: No. 22 AWG, paired and twisted multiple conductors, stranded (7x30) tinned copper conductors, overall aluminum foil-polyester tape shield with 100 percent shield coverage, plus tinned copper braid shield with 65 percent shield coverage.

F. Paired Wiegand Keypads Cables: Paired, 3 pairs, twisted, No. 22 AWG, stranded (7x30) tinned copper conductors, polypropylene insulation, individual aluminum foil-polyester tape shielded pairs each with No. 22 AWG, stranded tinned copper drain wire, 100 percent shield coverage.

G. Lock Cable: 1 pair, twisted, No. 16 AWG, stranded (19x29) tinned copper conductors.

H. Input Cable: 1 pair, twisted, No. 22 AWG, stranded (7x30) tinned copper conductors, polypropylene insulation, overall aluminum foil-polyester tape shield with No. 22 AWG, stranded (7x30) tinned copper drain wire, 100 percent shield coverage.

I. AC Transformer Cable: 1 pair, twisted, No. 18 AWG, stranded (7x26) tinned copper conductors, PVC insulation, unshielded, and PVC jacket.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR SECURITY SYSTEMS INSTALLATION

A. All materials shall be installed as per the manufacturers' instructions, unless noted otherwise.

B. Comply with NECA 1.

C. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

D. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

E. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both communications' equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

F. Right of Way: Give to piping systems installed at a required slope.

G. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

H. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

I. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

J. Thoroughly clean areas and spaces where work is performed or used as access to work. Remove completely, paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore all surfaces to their original condition.

K. All wall-mounted equipment shall be mounted square and plumb.

L. Complete work according to the agreed upon schedule. Cooperate in coordinating your activities with other planned and ongoing work at the site in a manner that facilitates meeting the schedule. This includes coordination with the various trades in determining work schedules and in resolving physical installation issues.

M. All materials, cables, components, and all aspects of the installation must meet all local, state, and federal laws, as well as applicable code and regulatory requirements. They must also meet the requirements of any other entity legally empowered to set standards or codes governing composition and use in this installation, as well as any rules specific to the site. Code and regulatory requirements must prevail if there are any conflicts with requirements stated or implied in this specification and its companion documents. Where there is uncertainty in determining precedence, or what specific code or regulatory

requirements apply, an Authority Having Jurisdiction (AHJ) over the issue in question will decide.

N. Designate a Project Manager to act as the technical and managerial interface with the Client and or its representatives.

O. Participate in meetings covering technical, installation, and coordination and management issues.

P. Perform all work required under this specification in a skillful and professional manner in accordance with standards and practices documented and/or accepted by industry, such as the ANSI/TIA/EIA, NECA standards and codes. The Security Contractor's technicians must be familiar with the proper assembly and installation of all components they are working with, and must follow manufacturer's specific installation requirements.

Q. Order all components in a timely manner so that installation dates are not compromised. Materials must either be on hand, or available on short notice, so that the installation may be expedited if required, or if the opportunity to do so presents itself.

3.2 ENCLOSURES FOR ESS

A. All enclosures that are not installed in a secured space, such as IT/AV Room shall have tamper provisions:

1. Tamper switches shall be mechanically mounted to maximize the defeat time when enclosure covers are opened and removed. The minimum amount of time required to depress or defeat the tamper switch after opening or removing the cover shall be greater than one (1) second.
2. Enclosure and tamper switch shall function in such a manner as to not allow direct line of sight to any internal components or the tampering of the switch or circuit wiring. Tamper switches shall be inaccessible until the switch is activated; have mounting hardware concealed so that location of the switch cannot be observed from the exterior of the enclosure; be under electrical supervision at all times, irrespective of the protection mode in which the circuit is operating; shall be spring-loaded and held in the closed position by the door protected; and shall be wired so that they break the circuit when the door is disturbed.
3. Tamper switches on doors which must be opened to make normal maintenance adjustments to the system and to service the power supplies shall be of the push/pull set, automatic-reset type. Covers of pull and junction boxes provided to facilitate initial installation of the system need not be provided with tamper switches.

3.3 ALARM ANNUNCIATION

A. Alarm annunciation shall include intrusion detection, tamper, fail safe, line fault, and power loss.

B. Intrusion Detection: Intrusion detection alarms shall include the full range of interior point protection sensors, volumetric space, access control protection sensors, and duress alarms. Duress alarms shall be annunciated to clearly distinguish them from other intrusion detection alarms.

C. Tamper: Enclosures, cabinets, housings, boxes, raceways, and fittings having hinged doors or removable covers and which contain circuits for the security system and its power supplies, shall be provided with cover operated, corrosion-resistant tamper switches, arranged to initiate an alarm signal when the door or cover is moved as little as one quarter (1/4) inch from the normally closed position. Tamper switches shall be mechanically mounted to maximize the defeat time when enclosure covers are opened or removed. The minimum amount of time required to depress or defeat the tamper switch after opening or removing the cover shall be one (1) second. Enclosure and tamper switch shall prevent direct line of sight to any internal components and prevent switch or circuit tampering. Tamper switches shall be inaccessible until the switch is activated; conceal mounting hardware so that location of the switch cannot be observed from the exterior of the enclosure; be under electrical supervision at all times, irrespective of the protection mode in which the circuit is operating; shall be spring-loaded and held in the closed position by the door or cover protected; and shall be wired to break the circuit when the door or cover is disturbed. Tamper switches on doors which must be opened to make normal maintenance adjustments to the system and to service the power supplies shall be of the push/pull set, automatic reset type. Tamper alarms shall be annunciated to be clearly distinguishable from intrusion detection alarms.

D. Line Fault: As a minimum, fault isolation at the systems level shall have the same geographic resolution as provided for intrusion detection. The communication links of the security system shall have an active mode for line fault detection. Active mode is defined as that in which some type of signal is continuously sent across the link, resulting in simple link breaks being readily detected. The system shall be either a static system or a dynamic system. In a static system, the "no-alarm" condition shall always be represented by the same signal, which shall be different than the signal originally transmitted. The dynamic system shall represent "no-alarm" with a signal which continually changes with time.

E. Power Loss: Provide the capability to detect when any critical component of the system experiences loss of primary power and/or is switched over to either emergency power or uninterruptible power and to declare an alarm. The alarm shall clearly annunciate the identity of the component experiencing the power loss.

3.4 GROUNDING AND BONDING

A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.

B. Comply with ANSI-J-STD-607-A.

C. All cabling used to bond grounds are to be tagged with labels with the point of origin i.e. going to/coming from, with printed labels.

3.5 PATHWAYS INSTALLATION FOR SECURITY SYSTEMS

A. Comply with NECA 1.

B. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.

C. All conduits shall be electrical metallic tubing (EMT), except where otherwise noted. Exceptions shall be requested in writing as appropriate, such as for different conduit types for various classes of construction, such as for cast-in-place concrete, and placement in cable ducts. Minimum size of conduit shall be three quarter (3/4) inch. Connections shall be threadless type fittings or couplings. Fastenings and supports for conduit shall be in accordance with the national and local codes.

D. Security Contractor shall submit conduit and wire layout drawings showing wiring and conduit routings for approval. Shop drawings of the security systems conduit routing shall be coordinated with fire wall construction, mechanical duct work, structural components, fire protection, and plumbing.

E. Install manufactured conduit sweeps and long-radius elbows whenever possible.

F. Care shall be taken to ensure that access to other building components (e.g., air conditioning ducts) is not restricted by cable pathways.

G. Cable management and support hardware must be UL listed for use in the environments in which they will be employed.

H. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.

I. Secure conduits to backboard when entering room from overhead.

J. Extend conduits 3 inches above finished floor.

K. Provide metal conduits with grounding bushings and connect with grounding conductor to grounding system.

L. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

M. Pathways shall be installed parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings. Changes in direction of runs shall be made with symmetrical bends or cast metal fittings.

N. All conduits shall be affixed or supported at intervals and using prescribed methods and devices in accordance with governing codes. No run of conduit between outlets or fittings shall contain more than four quarter bends (360 degrees). Bends shall be made such that the conduit will not be injured and that the interval diameter will be effectively reduced.

O. All conduit connections shall be tight so as not to create intermittent loss of ground protection. All cut ends entering into fittings shall be reamed smooth or have a bushing inserted to prevent damage to wire insulation.

P. Conduit, raceways and other pathways shall be kept at least six inches from uninsulated flues, steam pipes or any pipe containing a hot gas or liquid. So far as practical, avoid traps and dips in conduit runs, which might collect moisture.

Q. Strict attention shall be given to all conduits containing fiber optic cabling to ensure that manufacturer's recommended conduit bend radii limitations/restrictions are followed.

R. Where conduits connect to sheet steel enclosures, they shall be fastened with two (2) locknuts where insulating bushings are used. Bushings shall be installed on ends of all conduits where they terminate in pull boxes, outlet boxes, cabinets, etc. and shall be of the insulating type and shall be securely fastened with locknuts on each side. Crushed or deformed conduits shall not be installed. Bushings shall not be used as locknuts. Open ends shall be sealed around security conductors to be liquid tight using an approved air-drying sealer after capping ends with insulated bushings.

S. Conduits crossing expansion joints in concrete slabs shall be provided with suitable expansion fittings, or other suitable means, to compensate for building expansion and contraction. Conduits traversing hazardous areas shall use the penetrations and fittings shown on the drawings and provided under other sections of the contract. Seal the fittings subsequent to verifying the integrity of the contained conductors.

T. Pathways shall not block ceiling or equipment access doors. Where conduit or raceway is passed through walls, floors, ceilings or roofs, annular space shall be sealed or patched. Openings in firewalls and all corridor walls shall be sealed with mineral wool or an approved silicone sealant.

U. No pathways shall be fastened to other pipe or conduit or installed so as to prevent the ready removal of other pipe or conduit for repairs.

V. Conduit, panels, devices and boxes shall be secured by means of shields in concrete, machine screws on metal surfaces and wood screws on wood construction material. Threaded studs driven in my power charge and provided with either lock-washers and nuts or nail type nylon anchors are not acceptable in lieu of machine screws. Wood plugs shall not be used as expansion shields. Unless conditions or Drawings dictate otherwise, panels shall be located between 3'-6" and 6'-0" above floor level.

3.6 SLEEVES INSTALLATION FOR SECURITY SYSTEMS

A. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

B. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

C. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

D. Cut sleeves to length for mounting flush with both surfaces of walls.

E. Extend sleeves installed in floors 50 mm above finished floor level.

F. Size pipe sleeves to provide 6.4-mm annular clear space between sleeve and pathway or cable, unless indicated otherwise.

G. Seal space outside of sleeves with grout for penetrations of concrete and masonry

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

H. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint.

I. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pathway and cable penetrations. Install sleeves and seal pathway and cable penetration sleeves with firestop materials.

J. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

K. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel or cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 25-mm annular clear space between pipe and sleeve for installing mechanical sleeve seals.

L. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 25-mm annular clear space between pathway or cable and sleeve for installing mechanical sleeve seals.

3.7 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electronic safety and security installations to restore original fire-resistance rating of assembly.

3.8 CABLE/WIRES INSTALLATION

A. Cable/wire runs, and conduit shall be installed in accordance with applicable electrical Work standards, national and local codes as well as manufacturers' specifications of installed equipment.

B. All ESS conductors shall be separated from 240V primary power lines. ESS conductors shall not share any conduit in which primary power conductors are run. Junction and receptacle boxes carrying 240V, or higher voltage, shall not in any way be attached to or carry security systems conductors.

C. Conductors shall be copper and shall not have a diameter less than eighteen (18) AWG unless otherwise indicated. Exceptions will be made for vendor-provided leads and internal equipment wiring. If required, modify equipment wiring fittings which will not accept eighteen (18) AWG minimum conductors. Conductors for intercom systems and for multiplexer data communications shall be a minimum of twenty-two (22) AWG. Other exceptions may be granted for use of smaller gauge conductors upon approval by the Owner's' representatives.

D. Conductors interconnected to equipment subject to movement shall be stranded or shall be of a type manufactured specifically for such interconnections.

E. Wire fill, conductors, and conduit shall be sized in compliance with the National Electrical Code. The number of conductors required may vary on the basis of the manufacturers of the selected equipment. In no event, shall conduit fill exceed 40%.

F. If ESS conductors must share conduit with other low voltage conductors, prior approval is required. All system conductors shall be run concealed wherever practical and shall be placed in conduit.

G. All conductors shall be run continuously between sensors, processors, junction boxes, terminal strips or panels, and other approved devices. Splices between such locations are not to be permitted. Necessary junctions shall be made using screw-type terminal blocks, or in accordance with manufacturer's requirements for equipment connections.

H. Line supervision requirements shall be observed

I. All conductors shall be color coded and tagged consistently. Coordination with the Owner's' representatives regarding the exact wire coding and tagging is mandatory. Transposing or changing color coding of conductors shall not be permitted. Conductor identification shall be provided within each enclosure where a tap, splice or termination is made, and at the equipment terminal of each conductor. Terminal and conductor identification shall match that shown on approved shop drawings. Hand lettering or marking will not be accepted. Marking shall be an approved permanent type utilizing an approved method. Tagging devices shall be approved and shall be permanent, not subject to inadvertent separation. All conductors at control consoles shall be bundled, neatly fanned out, and tagged. Cables and wires shall be tagged to clearly indicate their electrical characteristics, circuit number and panel designation. Tagging shall be such that several conductors may be disconnected and reconnected without the use of drawings.

J. If required by manufacturers' specifications, shielding requirements shall be observed.

K. Only approved pulling compounds shall be used. Pull strengths shall not exceed standards established by the National Electrical Code.

L. Submit conduit and wire layout drawings showing circuit numbers, wiring and conduit routings for approval by the Engineer prior to the initiation of Work. Shop drawings of the security systems conduit routing shall be coordinated by Security Contractor with fire wall construction, mechanical duct work, structural components, fire protection, and plumbing.

3.9 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.10 IDENTIFICATION FOR SECURITY SYSTEMS

A. Identify ALL system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

B. See evaluations for discussion of TIA/EIA standard as it applies to this Section. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 3 level of administration including optional identification requirements of this standard.

C. All permanent labels must be durable and legible and suited for long term use in the environments in which they will be located. Labels shall be preprinted or computer-printed type. Handwritten labels are unacceptable unless approved by the Owner.

D. Label all equipment, enclosures, cables, terminations and any other components using unique identifiers.

E. Labeling scheme for all communications systems is subject to prior approval by the Owner.

F. All cables shall be color coded and tagged consistently. Transposing or changing color coding of conductors shall not be permitted. Conductor identification shall be provided within each enclosure where a tap, splice or termination is made, and at the equipment terminal of each conductor. Terminal and conductor identification shall match that shown on approved shop drawings. Hand lettering or marking will not be accepted. Marking shall be an approved permanent type utilizing an approved method. Tagging devices shall be approved and shall be permanent, not subject to inadvertent separation. All conductors at control consoles shall be bundled, neatly fanned out, and tagged. Cables and wires shall be tagged to clearly indicate their electrical characteristics, circuit number and panel designation. Tagging shall be such that several conductors may be disconnected and reconnected without the use of drawings.

3.11 CLEAN, SQUARE INSTALLATION

A. All equipment shall be clean and free of paint and other defacing materials. All installations shall be square and plumb. Take care that other trades do not deface equipment and do not move equipment out of square and plumb.

3.12 ELECTRICAL POWER

A. High Voltage Power:

1. The Electrical Contractor shall furnish and install wiring, conductors, conduit, and termination for the supply of power to security system components. Except for the interconnection into the door hardware furnished devices, it shall be the responsibility of the Security Contractor to furnish and install all low-voltage conductors and to make all final connections of same. The Security Contractor shall provide the Electrical Contractor with complete information regarding high voltage power requirements.

B. Low Voltage Power:

1. Low voltage power shall be provided through the use of two-winding isolation-type transformers and rectifier circuits and shall supply DC voltages, where and as required. Voltage levels shall be as rated for the various systems' operational requirements. All low voltage power supplies

shall be fully regulated, float type, with battery back-up, capable of supporting the operation of all equipment for a minimum of four hours. Low voltage power supplies shall be required to provide central lock power, camera power, advanced processor controller power and sensor devices power. A dedicated power supply shall be provided for the electrified locks. The locks power supply shall be tied into the building fire alarm system.

C. Batteries:
   1. Provide backup power by dedicated batteries in remotely located system elements such as remote access control panel units. Batteries shall be sized to provide continuous stand-by operation for a minimum of four (4) hours without recharge or replacement.

3.13 TESTING

A. General: Verify that all requirements of this specification are met. Verification shall be through a combination of analyses, inspections, demonstrations, and tests, as described below.

B. Verification by Inspection: Verification by inspection includes examination of an item and the comparison of pertinent characteristics against the qualitative or quantitative standard set forth in the cited paragraph. Inspection may require moving or partially disassembling the item to accomplish the verification. Inspection shall be made of all equipment installations, proper functioning of all locking hardware and lock controls, mounting and wiring of electrical and signal distribution cabinets and components, and mounting and placement of sensors, VSS cameras, etc. to ensure compliance to the specifications and that the overall installation is accomplished in a professional and workmanlike manner. The Owner's' representative(s) shall have full opportunity to witness the inspections or to conduct his own inspections of the installation.

C. Verification by Test and Demonstration: Verify by formal demonstrations or tests that the requirements of this Specification have been met.

D. Test Verification Requirements: Paragraphs 1-3 below list specific requirements which shall be verified by formal demonstration/test. Notify Owner fourteen (14) day in advance of all subsystem demonstrations/tests. The Owner's Representative shall have the right to witness any and/or all of the tests described below.
   1. Preliminary Tests: Following installation, individually test each sensor and other components and verify the proper functioning of each component within a particular subsystem. Each subsystem shall be similarly tested until all detection zones, alarm assessment components, alarm reporting and display, and access control functions have been verified. Any deficiency pertaining to these requirements shall be corrected prior to final functional and operational tests of the system. When subsystem verification is complete, the entire system shall be tested to assure that all elements are compatible and function properly as a complete system.

2. System Operation Test: Following completion of the preliminary tests and the security system and component formal demonstrations, conduct a formal test, to be known as the "System Operation Test", in which all components and subsystems of the security system are demonstrated to operate together as an integrated system. This test shall be performed over a continuous seventy-two (72) hour period. A testing plan and test procedures for each portion of the test shall be prepared by the Security Contractor and submitted 45 days prior to the start of any testing for approval in accordance with this Specification. Approval of the test procedures must be obtained prior to notification of testing to Owner or its representative. Demonstrate that the security system components and subsystems meet specification requirements in the "as-installed" operating environment during the "System Operation Test".
3. Tests Upon Completion of Work: Upon completion of the Work, the system shall be subjected to complete functional and operational tests. When all required corrections have been accomplished, the system shall be retested. The Owner its Representatives shall be notified in writing fourteen days in advance of the proposed final acceptance testing and inspection date. The advance notice shall include written certification that the installation is complete and operable and has satisfactorily performed the final tests specified herein. The acceptance testing and final inspection will be accomplished in the company of the Owner's representatives. Prior to the test date, prepare and submit for approval a complete and detailed final acceptance test check off list ("punch list"). The list shall be a complete representation of all specified functions and conditions, including contingency, priority, and abnormal modes of operation. The arrangement of the list shall be such as to provide an orderly method of tabulating checks of system features, response and operation. The tests shall be structured so that all sensors and controls are stimulated directly in their installed and finally adjusted positions and all audible and visual displays, signals, alarms and other responses are observed and printed. At the time of final acceptance testing all required tests shall be repeated and all defects will be corrected until the system is found to be acceptable to the Owner' Representative. A log of all test activities and results shall be maintained. Typed copies of this log shall be submitted within seven days of the testing. Final tests shall include, but not limited to the following:
    a. Test of all central CPU's, peripherals, and all panel control functions.
    b. Test all graphic control and annunciation panel functions and displays.
    c. Test electrical supervision of all input/output sensor and data communication bus circuits.
    d. Test of all alarm initiating devices.
    e. Test of remote battery and battery chargers.
    f. Test of the UPS system including a battery discharge test
    g. Test of access control system to include tie-in to fire alarm system.

h. Complete operation tests under emergency power.
i. Test of fiber optics signal transmission system.
j. Visual inspection of all wiring;
k. Verification that all required submittals have been provided and have been accepted;
l. Demonstrate software and programming/reprogramming functions of all micro-processor systems.
m. Verification of systems response time.
n. Carefully plan and coordinate the final acceptance tests so that all tests can be satisfactorily completed during one continuous testing period. Provide all necessary instruments, labor and materials required for tests, the equipment manufacturer's technical representative, and qualified technicians in sufficient numbers to perform the tests within the time limits imposed by this Specification.
o. If the Owner, or authorized representative(s) are required to witness a re-test at a later date because the Security Contractor is either not adequately prepared to conduct the acceptance tests or because the systems being tested are failing such tests, which shall be solely determined by the Owner's representatives witnessing the tests, the costs of witnessing additional tests (based on time and materials at the established rates of the Owner's representatives) shall be borne exclusively by the Security Contractor. In such an event, the Security Contractor shall directly compensate the Owner's representatives witnessing the tests; compensation shall be provided within thirty calendar days of such, and all, additional tests.
p. Although successful completion of the final acceptance test has been completed, the security system shall not be considered accepted until it is determined that the complete security system is continuously trouble-free and operational, in a manner satisfactory to the Owner, for at least a seven-day period following final acceptance testing. A print-out of the system's activity log will be accepted as proof of compliance with this requirement. If the system fails this operational test, make the necessary adjustments and the seven-day period will restart from the beginning. If the system fails to complete this operational test for four (4) consecutive seven-day restarted test periods, the system shall be considered inoperable and unacceptable. Make all necessary repairs, adjustments, and/or replacements, at his cost. When all adjustments have been completed and after proper notice has been given, the complete acceptance test will be re-performed and witnessed from the beginning. The Security Contractor shall be liable for all expenses for witnessing the retest as specified above. Repeated unsatisfactory operation and chronic system failures shall be considered cause for the complete system removal and replacement by the Owner. In this event, the Security Contractor

shall be liable for all expenses and damages incurred, including legal fees and court costs.

4. Reliability/Maintainability Data: Record hours of component, subsystem and system operation, together with failure and repair data. This information shall be incorporated into the System Test Report to be submitted.

3.14 MAINTENANCE AND OPERATING INSTRUCTIONS

A. Prior to completion of the work, provide field operating instructions with respect to operation functions and maintenance procedures for the equipment and systems installed. Prior to application for final payment, provide copies of maintenance and operating instruction manuals in PDF format.

B. All equipment provided under this Section of the Specifications shall be placed in operation and shall function continuously in an operation test for a period of one week, without shut down due to mechanical failure.

C. Prior to scheduling the project final inspection and after completion of the entire installation period, provide all work required to adjust all controls, and all maintenance to place the systems in operation to meet the requirements of this section and Contract Documents.

D. Provide operating, service, maintenance instruction manuals containing replacement data for the equipment which will require operating, maintenance or replacement and one copy of this literature shall be available during the instruction of the operating personnel while the others are checked for completeness.

E. Each copy of the approved operating and maintenance manual shall contain copies of approved shop drawings, equipment literature, cuts, bulletins performance charts, pump curves, details, equipment and engineering data sheets and typewritten instructions relative to the care and maintenance for the operation of the equipment, all properly indexed and bound in a hard back three ring binder. Fly sheets shall be placed before instructions covering each section. The instruction sheets shall be in 8 1/2 inches by 11 inches with large sheets of drawings folded in neatly. Each manual shall have the following minimum contents:

1. Table of Contents
2. Maintenance
    a. Maintenance and Lubricating Instructions
    b. Replacement Charts
    c. Preventive Maintenance Recommendations
    d. Trouble-shooting Charts for Equipment Components
    e. Testing Instructions for each Typical Component
    f. System Draining and Filling Instructions
    g. Two typed sets of charts indicating equipment tag number, location of equipment, specific equipment service, greasing and lubricating requirements as recommended, lubricant type and intervals of lubrication.

h. Two types sets of instructions for ordering spare parts. Each set shall include name, telephone number and address of where they may be obtained.

3. Manufacturer's Literature
   a. The equipment for which shop drawings have been submitted and approved.
   b. Wiring Diagrams
   c. Installation Drawings
   d. Manufacturer's Representative and Contract Information
   e. Guarantees

3.15 CLEANING AND ADJUSTING

A. After installation, clean each system component of dust, dirt, grease or oil incurred or accrued from other project activities, and prepare for system activation by manufacturer's recommended procedures for adjustment, alignment or synchronization.

B. Each component shall be prepared in accordance with the appropriate provisions of the component's installation, operations, and maintenance manuals.

C. Any damage caused by the Security Contractor to parts of the building, its finish, or furnishings, shall be repaired by Security Contractor at no increase in Contract costs.

D. All items of equipment shall be thoroughly inspected, and any items dented, scratched or otherwise damaged, in any manner, shall be replaced or repaired and painted to match the original finish. All items so repaired and refinished shall be brought to the attention of the Owner's' Representative for inspection and approval.

END OF SECTION 28 05 00

MANDATORY PRE-BID MEETING

PROJECT #	**P1222-00**
LOCATION	**Washington Crossing State Park – 355 Washington Crossing Pennington Road, Titusville (Hopewell Township), Mercer County, NJ**
DATE	**February 21, 2024**
TIME	**10:00 A.M.**
CONTACT PERSON	**Gene Cardone**
PHONE #	**Office #: 609.633.2648** **Cell #: 609.306.2574**
MEETING LOCATION	**Visitor's Center - Washington Crossing State Park – 355 Washington Crossing Pennington Road, Titusville (Hopewell Township), Mercer County, NJ**

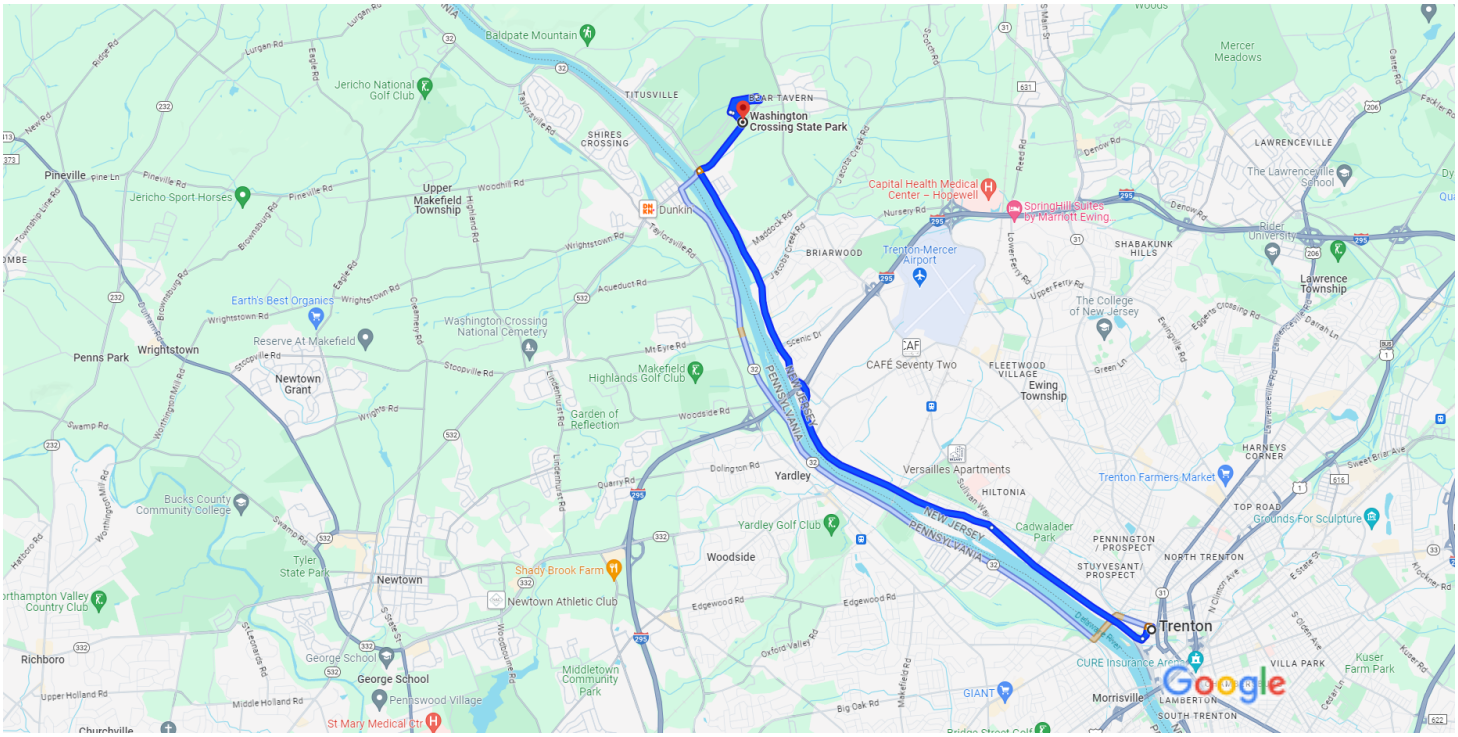
MUST ATTEND TO HAVE VALID BID

NOTE: It is each bidder's responsibility to determine the way to the location of the announced Pre-Bid meeting and to assure their timely arrival at the meeting. A maximum fifteen-minute grace period may be granted by the DPMC Project Manager, at his/her discretion, in case of extenuating circumstances determined prior to the scheduled start time. Bidders will be required to sign in at the beginning of the meeting. After the meeting has officially started, no other bidders will be permitted to sign-in. Failure to sign pre-bid sign in sheet will prohibit the bidder's proposal from being accepted.

Google Maps

33 W State St, Trenton, NJ 08608 to Washington Crossing State Park, 355 Washington Crossing Pennington Rd, Titusville, NJ 08560

Drive 10.2 miles, 18 min



Map data ©2024 Google 1 mi

33 W State St
Trenton, NJ 08608

Drive from NJ-29 N to Hopewell Township

13 min (9.0 mi)

1. Head west on W State St toward Barrack St

262 ft

2. Turn left onto Barrack St

0.2 mi

3. Take the ramp onto NJ-29 N

2.2 mi

4. Use any lane to turn slightly left onto NJ-29 N/Sanhican Dr
   Continue to follow NJ-29 N

5.8 mi

5. Turn right onto Washington Crossing Pennington Rd

0.8 mi

Take Brickyard Rd to your destination

5 min (1.2 mi)

6. Turn left

0.2 mi

7. Turn right at the 1st cross street onto Brickyard Rd

0.4 mi

8. Turn left to stay on Brickyard Rd

0.4 mi

9. Turn left

0.2 mi

Washington Crossing State Park

355 Washington Crossing Pennington Rd, Titusville, NJ 08560

WASHINGTON CROSSING STATE PARK
NEW VISITOR CENTER

355 Washington Crossing-Pennington Road

Titusville, Mercer County, NJ 08560

PROJECT NO. P1222-00

PROJECT MANUAL, VOL. 1 of 3

ISSUED FOR BID

October 30, 2023

STATE OF NEW JERSEY

Honorable Philip D. Murphy, Governor

Honorable Sheila Y. Oliver, Lt. Governor

DEPARTMENT OF THE TREASURY

Elizabeth Maher Muoio, Treasurer

DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION

Christopher Chianese, Director

PROJECT MANUAL TABLE OF CONTENTS, VOL. 1 of 3

STATE OF NEW JERSEY

DEPARTMENT OF THE TREASURY

DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION

R E V I S E D

DECEMBER 2015

INSTRUCTIONS TO BIDDERS

AND

GENERAL CONDITIONS

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INSTRUCTIONS TO BIDDERS

IB 1 Bid Proposals

IB 1.1 Sealed proposals for the work described herein must be received and time-stamped in the Plan Room, Division of Property Management and Construction (DPMC), 9th Floor, 33 West State Street, P O Box 034, Trenton, NJ 08625-0034. The closing date and time for bids will be stated in the Advertisement for Bid. Bidders are cautioned that reliance on the US Postal Service or other mail delivery or courier service for timely delivery of proposals is at the bidders' risk. Failure by a bidder to have a sealed proposal reach DPMC by the prescribed time will result in rejection of the unopened submission.

IB 1.2 Bids may be accepted on the following branches of work, as applicable:

a. Lump Sum All Trades
b. General Construction
c. Structural Steel
d. Plumbing
e. Heating, Ventilating and Air Conditioning
f. Electrical
g. Special Categories as may be required

IB 1.3 Contractors classified by DPMC may obtain contract documents at the DPMC address above, or upon written request, subject to payment of applicable fees. Each bidder is herewith put on notice that its general classification by DPMC is not the sole basis for qualification for the award of work. The Director reserves the right to deny award to any bidder that is not clearly responsible, based upon experience, past performance, financial capability or other material factors, to perform the work required herein.

IB 1.4 The schedule of non-refundable bid fees below is based upon individual trade construction cost estimates. Upon request and at no cost the DPMC will furnish a set of the contract documents for review in the offices of the division at the address noted in paragraph IB1.1 above.

DPMC BID DOCUMENTS FEE SCHEDULE (PER PACKAGE):

TRADE ESTIMATE	DOCUMENT FEE	MAILING FEE
$100,000 or less	No charge	$25.00
Greater than $100,000	$ 65.00	$25.00

IB 1.5 Bid proposals based upon the plans, specifications, general, special and supplementary conditions and bulletins shall be deemed as having been made by the contractor with full knowledge of the conditions therein. Bidders are required to visit the site prior to submitting proposals for the work herein described, and to have thoroughly examined the conditions under which the contract is to be executed, including those reasonably observable conditions of the premises which would hinder, delay, or otherwise affect the performance of the contractor required under the terms of the contract. The State will not allow claims for additional costs as a result of the contractor's failure to become aware of the reasonably observable conditions affecting its required performance. The bidder is required to make appropriate allowances in the preparation of the bid for the

accommodation of such conditions. Bidders must warrant in the bid documents that the bidder is familiar with conditions existing at the site at the time the bid is submitted.

IB 1.6 Bid proposals shall be submitted on the standard form provided by DPMC, enclosed in a sealed envelope issued by DPMC. The name and address of the bidder must be indicated on the envelope, as well as indication of the DPMC project number, project location and other appropriate identification.

IB 1.7 All amounts in the bid documents shall be stated in numerical figures only.

IB 1.8 The bidder must include in the bid envelope: (1) the proposal signed by the bidder, (2) the executed affidavit of non-collusion, (3) the executed Source Disclosure Certification Form as further described in section IB1.11, (4) the executed Disclosure of Investment Activities in Iran Form and (5) bid security as further described in Section IB6.

IB 1.9 Proposals shall remain open for acceptance and may not be withdrawn for a period of 60 calendar days after the bid opening date.

IB 1.10 Proposals not submitted and filed in accordance with instructions contained herein and in the Advertisement for Bids may be rejected as non-responsive.

IB 1.11 Procurement Reform

a. RESTRICTIONS ON POLITICAL CONTRIBUTIONS – In accordance with N.J.S.A. 19:44A-20.13, *et seq.*, bidders submitting a bid on or after October 15, 2004, shall be required to submit a Certification and Disclosure Form and Ownership Disclosure Form for all Business Entities. These forms must be submitted by the bidder and approved prior to contract award.

   N.J.S.A. 19:44A-20.13, *et seq*, prohibits State departments, agencies and authorities from entering into a contract that exceeds $17,500 with an individual or entity that has made a contribution to that political party committee. N.J.S.A. 19:44A-20.13, *et seq,* further requires the disclosure of all contribution to any political organization organized under section 527 of the Internal Revenue Code that also meets the definition of "continuing political committee" within the meaning of N.J.S.A. 19:44A-3(n) and N.J.A.C. 19:25-1.7. The successful bidder shall also be required to adhere to all continuing obligations contained in N.J.S.A. 19:44A-20.13, *et seq*, regarding contributions and disclosures as required in N.J.S.A. 19:44A-20.13, *et seq*.

b. Source Disclosure Certification - Pursuant to N.J.S.A. 52:34-13.2, *et seq.*, all bidders submitting a proposal shall be required to complete a Source Disclosure Certification that all services will be performed in the United States. The bidder shall disclose the location by country where services under the contract will be performed and any subcontracted services will be performed. The Source Disclosure Certification will be attached to the bid proposal.

c. MacBride Principles - Pursuant to N.J.S.A. 52:34-12.2, a bidder must complete a certification on the DPMC form provided prior to contract award to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates pursuant to N.J.S.A. 52:34-12.2, that the bidder has no ongoing business activities in Northern Ireland and does not maintain a physical

presence therein through the operation of offices, plants, factories, or similar facilities, either directly or indirectly, through intermediaries, subsidiaries or affiliated companies over which it maintains effective control; or will take lawful steps in good faith to conduct any business operations it has in Northern Ireland in accordance with the MacBride principles of nondiscrimination in employment as set forth in N.J.S.A. 52:18A-89.8 and in conformance with the United Kingdom's Fair Employment (Northern Ireland) Act of 1989, and permit independent monitoring of their compliance with those principles. If a contractor who would otherwise be awarded a contract or agreement does not complete the certification, then the Director may determine, in accordance with applicable law and rules, it is in the best interest of the State to award the contract or agreement to the next responsible bidder who has completed the certification. If the Director finds the contractor to be in violation of the principles which are the subject of this law, s/he shall take such action as may be appropriate and provided for by law, rule or contract, including, but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the contractor in default and seeking debarment or suspension of the contractor.

d. Investment Activities in Iran - Pursuant to N.J.S.A. 52, 32-55, *et seq.*, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete a certification with their bid on the DPMC form provided to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of Treasury's Chapter 25 list as a person or entity engaging in investment activities in Iran. The Chapter 25 list is found on the Division of Purchase and Property's website at www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf. Bidders must review this list prior to completing the certification. Failure to complete the certification may render a bidder's proposal non-responsive. If the Director finds a person or entity to be in violation of law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

IB 2 Bid Modification

IB 2.1 A bidder may modify its bid proposal by electronic mail or letter at any time prior to the scheduled closing time for receipt of bids, provided such communication is received by the DPMC prior to such closing time. A mailed confirmation of any modification signed by the bidder must have been mailed and time-stamped by the US Postal Service prior to the specified closing time. Such confirmation, whether transmitted electronically or by mail, shall be accompanied by a newly executed affidavit of non-collusion.

IB 2.2 Communications shall not reveal the basic bid price but shall only provide the amount to be added, subtracted or modified so that the final prices or terms will not be revealed until the sealed proposal is opened. If written confirmation of the telegraphic modification is not received within two working days after the scheduled closing time, no consideration will be given to the telegraphic modification.

IB 2.3 Bids may be withdrawn upon receipt of a bidder's written request prior to the time fixed for the bid opening. A bidder's right to withdraw a bid is lost after a bid has been opened. If an error has been made in the bid amount, request for relief from the bid may be made in writing to the Director. The written request shall be signed by an authorized corporate officer. A determination of whether the bidder will be released shall be at the sole discretion of the Director, who shall issue a finding within five working days of receipt of all pertinent information relating to such request for relief.

IB 3 Consideration of Bids

IB 3.1 Award of Contracts or Rejection of Bids:

a. Contracts will be awarded to the lowest responsible bidder. The awards will be made, or the bids rejected, within 60 calendar days from the date of the opening of bids. At the discretion of the Director, a bid extension may be requested from the bidders if circumstances warrant an extension.

b. The Director reserves the right to award the contract on the basis of the single bid for the entire work, or on the basis of a separate bid and alternate, or any combination of separate bids and alternates, which the Director deems best serves the interest of the State.

c. The Director reserves the right to waive any bid requirements when such waiver is in the best interests of the State, and where such waiver is permitted by law. Such waiver shall be at the sole discretion of the Director.

d. The Director reserves the right to reject any and all bids when such rejection is in the best interests of the State. The Director also may reject the bid of any bidder which, in the Director's judgment, is not responsible or capable of performing the contract obligations based on financial capability, past performance, or experience. A bidder whose bid is so rejected may request a hearing before the Director by filing a written notice.

IB 3.2 The bidder to be awarded the contract shall execute and deliver the requisite contract documents, including payment and performance bonds, within the time specified. Upon the bidder's failure or refusal to comply in the manner and within the time specified, the Director may either award the contract to the next low responsible bidder or re-advertise for new proposals. In either case, the Director may hold the defaulting bidder and its surety liable for the difference between the applicable sums quoted by the defaulting bidder and the sum which the State may be obligated to pay to the contractor which is contracted to perform and complete the work of the defaulting bidder.

IB 4 Awards

IB 4.1 In executing a contract, the successful bidder agrees to perform the required work in a good and workmanlike manner to the reasonable satisfaction of the Director, and to complete all work within the number of calendar days specified in its contract.

IB 4.2 Successful bidders will be notified of the time and place for the signing of contracts. Key requirements in the contract, including, but not limited to, the number of days of performance of the contract, manner and schedule of payments, and other administrative details will be reviewed at the award meeting. The time and place of the first job meeting will be announced at the award meeting.

IB 4.3 The State reserves the right to award the contract upon the basis of a single bid for the entire work, or on the basis of separate bids for each prime trade when the total of the separate bids is less than the single bid. Alternates will be accepted or rejected in numerical sequence as cited in the bid documents and shall not be selected at random except as provided herein. Add alternates and deduct alternates will be specified separately. The State may choose from the add and deduct alternates without priority between the two groups so long as selection within each group is in numerical sequence from the first to the last. This limitation shall not apply, however, to any alternates concerning proprietary items. The Director, with the approval of the Using Agency, may accept alternates out of sequence, provided the Director states the reasons for so doing, in writing, within five working days following the opening of bids.

IB 4.4 Should submission of unit prices be required for specified items of work in bid proposals, they will be considered in the evaluation of bids as set forth in the bid proposal form.

IB 4.5 The successful bidder and all of its subcontractors are required to comply with the requirements of N.J.S.A. 10:5-31 et seq., regarding Equal Employment Opportunity in Public Works Contracts.

IB 5 Qualification of Bidders

IB 5.1 If the successful bidder is a corporation not organized under the laws of the State of New Jersey or is not authorized to do business in this State (foreign corporation), the award of the contract shall be conditioned upon the prompt filing by the said corporation of a certificate to do business in this State and complying with the laws of this State in that regard. This filing must be made with the Division of Revenue. No award of contract will be made until the Division of Revenue confirms this authorization.

IB 5.2 The State requires that each contractor, except in the case of a single contractor, shall perform a minimum of 35 percent of the contract work by the contractor's own forces. However, the Director has the sole discretion to reduce this percentage depending upon the nature and circumstances in any particular case, if the Director determines that to do so would be in the best interests of the State, and provided that the bidder submits a written request with the original bid proposal.

IB 5.3 The State reserves the right to reject a bidder at any time prior to the signing of a contract if information or data is obtained which, in the opinion of the Director, adversely affects the responsibility and/or the capability of the bidder to undertake and to complete the work, regardless of the bidder's previous qualification or classification. The State may

conduct any investigation as it deems necessary to determine the bidder's responsibility and capacity, and the bidder shall furnish all information and data for this purpose as requested by the State.

IB 5.4 Each bidder must be classified by DPMC in accordance with the provisions of the classification statute, NJSA 52:35-1, *et seq.*,. In the case of a single bid for all of the work, the bidder shall include in the bid the names of its principal subcontractors (in categories as listed in IB1.2 above), which must also be classified in accordance with the said statute.

IB 5.5 At the time of the bid due date, the bidder and the subcontractors must be registered in accordance with "The Public Works Contractor Registration Act", N.J.S.A. 34:11-56.48, *et seq.* All questions regarding registration shall be addressed to:

Contractor Registration Unit
New Jersey Department of Labor
Division of Wage & Hour Compliance
P O Box 389
Trenton NJ 08625-0389
Telephone: 609-292-9464
FAX: 609-633-8591

IB 5.6 In accordance with N.J.S.A. 52:32-44, *et seq.*Public Law 2001, Chapter 134, all contractors and subcontractors providing goods/services to State agencies and authorities are required to provide the contracting agency or authority with proof of registration with the Department of Treasury, Division of Revenue. The basic registration process involves the filing of Form NJ-Reg., which can be filed online at www.state.nj.us/njbgs/services.html or by calling (609) 292-7077 or (609) 292-1730.

IB 6 **Deposit and Bid Bond**

IB 6.1 The Proposal, when submitted, shall be accompanied by a Bid Bond satisfactory to the Director, for the sum of not less than fifty percent (50%) of the Total Bid including alternates, if applicable.

IB 6.2 The Bid Bond shall be properly filled out, signed, and witnessed.

IB 6.3 The Bid Bond shall be accompanied by a copy of the power of attorney executed by the surety company or companies. The power of attorney shall set forth the authority of the attorney-in-fact who has signed the bond on behalf of the surety company to bind the company and shall further certify that such power is in full force and effect as of the date of the bond.

IB 6.4 If the bidder whose proposal is accepted is unable to provide the performance and payment bonds or fails to execute a contract, then such bidder and the bid bond surety, where applicable, shall be obligated to pay to the State the difference between the amount of the bid and the amount which the State contracts to pay another party to perform the work. The bidder and the surety shall pay, upon demand, the entire amount of the State's difference in cost. Should there be a deficiency in excess of the bid deposit, the bidder shall make immediate payment to the State for any such deficiency. Nothing contained herein shall be construed as a waiver of any other legal remedies that the State may have against the contractor.

IB 6.5 Attorneys-in-fact who sign bid bonds or contract bonds must file a certified power-of-attorney with the State indicating the effective date of that power.

IB 7 Performance and Payment Bond

IB 7.1 The successful bidder shall furnish within ten (10) calendar days after notice of award both a performance bond in statutory form in an amount equal to one hundred percent (100%) of the total contract price as security for the faithful performance of this contract and a payment bond in statutory form in amount equal to one hundred percent (100%) of the contract price as security for the payment of all persons and firms performing labor and furnishing materials in connection with this contract. The performance bond and the payment bond may be combined or in separate instruments in accordance with law. If combined, they must be for 200% of the award amount. No contract shall be executed unless and until each bond is submitted to and approved by the State. The surety must be presently authorized to do business in the State of New Jersey. In addition to the other coverage provided, the Bond shall cover all Contract guarantees and any other guarantees/warranties issued by the Contractor.

IB 7.2 The cost of all performance and payment bonds shall be paid for by the successful bidder.

IB 7.3 If at any time the State, for justifiable cause, is dissatisfied with any surety which has issued or proposes to issue a performance or payment bond, the contractor shall, within ten calendar days after notice from the State to do so, substitute an acceptance bond (or bonds). The substituted bond(s) shall be in such form and sum and executed by such other surety or sureties as may be satisfactory to the State. The premiums on such bond(s) shall be paid by the contractor. No contract shall be executed and/or no payment made under a contract until the new surety or sureties shall have furnished such an acceptable bond to the State.

IB 7.4 Bonds must be legally effective as of the date the contract is signed. Each must indicate the contractor's name exactly as it appears on the contract. Current attorney-in-fact instruments and financial statement of the surety must be included with the bonds. Bonds must be executed by an authorized officer of the surety. Bonds furnished under this section shall conform in all respects to the requirement and language of NJSA 2A:44-143 to 147.

IB 8 Bulletins and Interpretations

IB 8.1 No interpretation of the meaning of the plans, specifications or other pre-bid documents will be provided to any bidder unless such interpretation is made in writing to all prospective bidders prior to the opening of bids. Any such interpretations must be identified in bid proposals submitted. Any interpretations which are not entered in accordance with this provision shall be unauthorized and not binding upon the State.

IB 8.2 Every request for an interpretation relating to clarification or correction of the plans, specifications, or other bid documents must be made in writing, addressed to the architect/engineer and the DPMC Director, and must be received at least five (5) working days prior to the date fixed for the opening of the bids. Any and all interpretations, clarifications or corrections and any supplemental instructions must be issued by the Director in the form of written bulletins and mailed by certified mail, return receipt requested, or by electronic notice to all prospective bidders not later than three (3) working days prior to the date of the opening of bids. All bulletins issued shall become part of the

contract documents and shall be acknowledged in all bid proposals. Failure of a bidder to acknowledge receipt of all such bulletins and interpretations by the time of bid opening shall result in its proposal being considered non-responsive, at the option of the Director.

IB 8.3 Each bidder shall be responsible for thoroughly reviewing the contract documents prior to the submission of bids. Bidders are advised that no claim for expenses incurred or damages sustained as a result of any error, discrepancy, omission, or conflict in the contract documents shall be recognized by the State unless, and only to the extent that, a written request for interpretation, clarification or correction has been submitted in compliance with Section IB8.2 and provided the matter has not been addressed by the State through the issuance of a bulletin interpreting, clarifying or correcting such error, discrepancy, omission or conflict.

IB 9 Assignments

IB 9.1 The contractor shall not assign all or any part of this contract without written consent of the State. Money due (or to become due) the contractor hereunder shall not be assigned for any purposes whatsoever.

IB 10 Federal Excise Taxes and State Sales Tax

IB 10.1 In general, bidders, in preparing bids, must take into consideration applicable Federal and State tax laws.

IB 10.2 Materials, supplies or services for exclusive use in erecting structures or buildings or otherwise improving, altering or repairing all State-owned property are exempt from the State sales tax. The successful bidder must submit Division of Taxation form ST13, Exempt Use Certificate, to the seller of all materials, supplies or services that will be incorporated into the Work.

IB 10.3 Bidders must determine the current status and applicability of any tax laws, and the contractor may make no claim based upon any error or misunderstanding as to the applicability of any tax laws.

IB 10.4 Purchases or rentals of equipment are not exempt from any tax under the State Sales Tax Act.

IB 11 Restrictive Specifications

IB 11.1 Should any bidder determine before the bid due date that any portion of the specifications or drawings specify a particular product which can be provided by only one supplier or manufacturer, with the result that competitive prices are not available, the bidder shall immediately notify the Director in writing of such fact.

IB 11.2 If such notice is not given in a timely manner, it shall be assumed that the bidder has included the estimate of such sole source in the bid. However, if the Director is notified in a timely manner of the sole source of supply or manufacture, the Director may order the product re-bid or take other lawful action. Such action shall be at the Director's sole discretion.

IB 12 Offer of Gratuities

IB 12.1 Bidders are advised that the laws of New Jersey (NJSA 52:34-19) make it a misdemeanor to offer, pay or give any fee, commission, compensation, gift or gratuity to any person employed by the State. Also, Executive Order #189 (1988) requires that all requests for proposals and contracts issued by the State specify prohibitions on vendor (contractor) activities, the violation of which shall render the vendor liable to ineligibility for State contracts, pursuant to the debarment procedures set forth in N.J.A.C. 17:19-4.1., *et seq*. These prohibited activities include the following:

a. No vendor shall pay, offer to pay, or agree to pay, either directly or indirectly, any fee, commission, compensation, gift, gratuity, or other thing of value of any kind to any State officer or employee or special State officer or employee, as defined by NJSA 52:34D-13b. and e., in the Department of Treasury or any other agency with which such vendor transacts or offers or proposes to transact business, or to any member of the immediate family, as defined by NJSA 52:13D-13i., of any such officer or employee, or any partnership, firm, or corporation with which they are employed or associated, or in which such officer or employee has an interest within the meaning of NJSA 52:13D-13g.

b. The solicitation of any fee, commission, compensation, gift, gratuity or other thing of value by any State officer or employee or special State officer or employee from any State vendor shall be reported in writing forthwith by the vendor to the Attorney General and the Executive Commission on Ethical Standards.

c. No vendor may, directly or indirectly, undertake any private business, commercial or entrepreneurial relationship with, whether or not pursuant to employment, contract or other agreement, express or implied, or sell any interest in such vendor to, any State officer or employee or special State officer or employee having any duties or responsibilities in connection with the purchase, acquisition or sale of any property or services by or to any State agency or any instrumentality thereof, or with any person, firm or entity with which he is employed or associated or in which he has an interest within the meaning of NJSA 52:13D-13g. Any relationships subject to this provision shall be reported in writing forthwith to the Executive Commission on Ethical Standards, which may grant a waiver of this restriction upon application of the State offer or employee or special State officer or employee upon a finding that the present or proposed relationship does not present the potential, actuality or appearance of a conflict of interest.

d. No vendor shall influence, or attempt to influence or cause to be influenced, any State officer or employee or special State officer or employee in his official capacity in any manner which might tend to impair the objectivity or independence of judgment of said officer or employee.

e. No vendor shall cause or influence, or attempt to cause or influence, any State officer or employee or special State officer or employee to use, or attempt to use, his official position to secure unwarranted privileges or advantages for the vendor or any other person.

f. The provisions cited above in paragraphs IB12.1.a. through e. shall not be construed to prohibit a State officer or employee or special State officer or employee from receiving gifts from or contracting with vendors under the same terms and conditions as are offered or made available to members of the general public subject to any guidelines the State Ethics Commission on Ethical Standards may promulgate under paragraph IB12.1.c. above.

END OF INSTRUCTIONS TO BIDDERS

GENERAL CONDITIONS

ARTICLE 1 - GENERAL PROVISIONS

1.1 DEFINITIONS:

1.1.1 Architect/Engineer: The Architect/Engineer ("A/E") is the consultant engaged by the DPMC to prepare the design and perform certain contract administration functions in accordance with the provisions of its contract with the DPMC.

1.1.2 Bulletin: A document, issued by DPMC prior to the opening of bids, which supplements, revises or modifies the bid document(s).

1.1.3 Change in the Work: A change in the Project and the Contract Documents, including, but not limited to, an increase or decrease in the Work, an acceleration or extension of time for the performance of the Work.

1.1.4 Change Order: A written order, directing or authorizing a Change in the Work executed by the DPMC and agreed to by the Contractor (except in the case of unilateral change orders executed by DPMC) that includes all adjustments to work, compensation and/or time warranted by the Change in the Work.

1.1.5 Code Official: the individual licensed by the NJ Department of Community Affairs authorized to enforce the NJ Uniform Construction Code (UCC) and approve or reject the Work for NJ UCC compliance.

1.1.6 Construction Management Firm or "CMF": A person or firm that may be engaged by the DPMC to assist DPMC in the administration of its contracts.

1.1.7 Contract: The entire and integrated agreement between the Contractor and the DPMC encompassing all of the Contract Documents.

1.1.8 Contract Documents: The executed form of Contract, General Conditions, Supplementary Conditions, Supplementary Instructions, Bulletins, plans, specifications, instructions to bidders, addenda, responses to requests for information, Price Proposal, Change Orders, other amendments, including construction change directives, and all exhibits, appendices and documents attached to or referenced in any of the foregoing materials.

1.1.9 Contract Limit Lines The lines shown on the Contract Drawings that define the boundaries of the Project, and beyond which no construction work or activities may be performed by the Contractor unless otherwise noted on the drawings or specifications.

1.1.10 Contractor: The business entity with whom the DPMC enters a contract for the performance of the construction of a construction Project by the terms set forth in the Contract Documents.

1.1.11 Contract Price: The sum stated in the Contract, as it may be adjusted in accordance with the Contract Documents, that represents the total amount payable by the DPMC to the Contractor for performance of the Work.

1.1.12 Day: A calendar day, unless otherwise designated.

1.1.13 Director: The person authorized by statute to administer the design, engineering and construction of all State buildings and facilities. The Director is the contracting officer representing the State personally or through authorized representatives in all relationships with Contractors, consultants and Architects/Engineers. This includes designees or an authorized administrative contracting officer acting within the limits of his or her authority. The Director or his or her duly authorized representative is the interpreter of the conditions of this contract and the judge of its performance.

1.1.14 Division of Property Management and Construction (DPMC): The State of New Jersey's contracting agency for the design and construction of State facilities.

1.1.15 Final Acceptance and Completion: The date following receipt and acceptance by DPMC of all administrative and close-out documents. Following acceptance, the DPMC will issue a Certificate of Final Acceptance and Completion for the Project.

1.1.16 Generally Accepted Accounting Principles: The common set of accounting principles, standards and procedures that companies use to compile their financial statements. Accounting records must identify all labor and material costs and expenses, whether they are direct or indirect. The identity must include at least the Project number for direct expenses and/or account number for indirect expenses.

1.1.17 NJUCC or Code: The New Jersey Uniform Construction Code which governs the permit and approval process for construction projects.

1.1.18 Notice: A written directive or communication given by DPMC to the Contractor to act or perform work or carry out some other contractual obligation, or a written communication to be served by the Contractor upon the State. A notice served on the Contractor will be deemed to have been duly served if delivered to an individual or member of the firm or entity or to an officer of the corporation for whom it was intended. This includes regular mail, e-mail, delivery by courier, or registered or certified mail, or facsimile to the Contractor's business address cited in the Contract documents. A notice from the Contractor to the State shall be deemed to have been duly served only if delivered to the Director or the Director’s duly authorized representative.

1.1.19 Notice to Proceed: The written communication issued by the DPMC to the Contractor directing the Contractor to begin the Work. The contract calendar day duration period will commence on the effective date noted.

1.1.20 Project: The term for the entire public works engagement. It includes the design, construction work and all administrative aspects required to fully complete the engagement.

1.1.21 Punch List: The list of incomplete or defective Work, compiled by DPMC and/or its authorized representative, which remains to be completed after achievement of Substantial Completion.

1.1.22 Schedule: The time tracking mechanism that establishes the Project’s allotted time requirements for completion as more specifically described in Article 6 of these General Conditions. When the construction activity items of the schedule have a monetary value associated with them, the schedule is referred to as a “costed” or “cost-loaded” schedule.

1.1.23 Site: The geographical location of the facility or property at which the Work under the Contract is to be performed.

1.1.24 State or Owner: The State of New Jersey, acting through DPMC.

1.1.25 Subcontractor: The business entity that enters into an agreement with the Contractor for the performance of work or materials under this Contract. Also refers to any agreement between a Subcontractor and any of lower tier Subcontractors. Such an agreement creates no relationship, legal or otherwise, between the DPMC and the Subcontractor(s) and/or lower tier Subcontractor(s).

1.1.26 Substantial Completion: The date when all essential requirements of the Contract Documents have been satisfied so that the purpose of the Contract Documents is accomplished, as determined by the DPMC including training of staff by the Contractor on all equipment, and resulting in the issuance of a temporary Certificate of Occupancy, a permanent Certificate of Occupancy or a permanent Certificate of Acceptance and when the Work and the facility can be safely occupied and used in accordance with its intended purpose. DPMC may condition issuance of a Certificate of Substantial Completion upon satisfactory receipt of critical documents.

1.1.27 Unit Schedule Breakdown: A detailed list of the Work activities required for Project construction, other elements associated with fulfilling the requirements of the Contract (bonds, insurance, etc.), major items of material, labor or equipment, and the prices associated with each of them.

1.2.28 Using Agency: The State department or agency for whom the construction project is being completed.

1.1.29 Work: All construction, supervision, labor, material and equipment necessary to complete the obligations under the Contract including Operation and Maintenance Manuals, Punch List completion, and As-Built Documents.

1.2 CONTRACT DOCUMENTS TO BE PROVIDED BY DPMC

Upon Contract award, the DPMC will furnish to the Contractor, free of charge, three copies of the drawings and specifications, and any additional instructions by means of supplemental contract documents as otherwise necessary for the proper execution of the Work, unless otherwise provided in the Contract Documents. Upon request, additional copies of the contract documents will be furnished at the Contractor's expense.

1.3 INTENT OF THE CONTRACT

1.3.1 The drawings, specifications and all of the Contract Documents are intended to require the Contractor to provide for everything necessary to accomplish the proper and complete finishing of all work. For the Project, the Contractor shall perform all of the obligations and work identified in the Contract Documents, regardless of the manner in which it is divided among the trades or the order in which it appears in the Contract Documents. All work and materials included in the specifications and not shown on the drawings, or shown on the drawings and not in the specifications shall be performed and/or furnished by the Contractor. The Contractor shall include any incidental materials

and/or Work not indicated in the drawings and/or the specifications which are nevertheless necessary for the development of the Project and are reasonably inferable from the contract documents and industry practice. The Contractor shall perform all such work and furnish all such materials as if particularly delineated or described in the contract documents as part of the bid proposal.

1.3.2 The Contractor acknowledges that in preparing its bid, the Contractor had the obligation to raise any reasonably observable errors, omissions, ambiguities or discrepancies and request an interpretation of the alleged errors, omissions, ambiguities or discrepancies. If the Contractor failed to do so, it will have waived all rights to a Change Order or claim and the Contractor will be responsible to complete the Work as required, consistent with the intent of the Contract Documents as interpreted by the DPMC, without additional compensation.

1.3.3 No interpretation of the meaning of the plans, specifications or other Contract Documents provided prior to bid submission shall be binding upon the State for any purpose unless issued in a Bulletin.

1.3.4 The Contractor shall abide by and comply with the intent and meaning of the Contract Documents taken as a whole, and shall not take advantage of any error or omission, should any exist. Should the Contractor become aware of the existence of any error, omission or discrepancy, the Contractor shall immediately notify the DPMC and the Architect/Engineer of any such errors, omissions, ambiguities or discrepancies and seek correction or interpretation thereof prior to commencement of the Work at issue. The Architect/Engineer shall issue a written interpretation. The Contractor shall do no work outside of the Contract Documents, unless written authorization to proceed from the DPMC is received by the Contractor.

1.3.5 Each and every provision required by law to be inserted in the Contract Documents is deemed to have been inserted therein. If any such provision has been omitted or has not been correctly inserted, then upon application of either party, the Contract may be modified to provide for such insertion or correction.

1.3.6 The order of precedence pertaining to interpretation of Contract Documents is as follows:

a. Executed Contract

b. Bulletins and Instructions

c. Supplemental General Conditions

d. Specifications and General Conditions

e. Drawings, in the following order of precedence:

(1) Notes on drawings

(2) Large scale details

(3) Figured dimensions

(4) Scaled dimensions

1.3.7 Where there may be a conflict in the Contract Documents not resolvable by application of the provisions of this Article, then the more expensive labor, materials, or equipment shall be assumed to be required and shall be provided by the Contractor.

1.3.8 On all work, it shall be the responsibility of the Contractor, by personal inspection of the existing building, facility, plant or utility systems, to ascertain the accuracy of any information given. This shall be the case, whether or not such information is indicated on the drawings, included in the specifications, or shown in any other documentation that is available. The Contractor shall have an affirmative duty to make reasonable inquiry for all available information. The Contractor shall include the costs of all material and labor required to complete the Work based on inspection and reasonably observable conditions.

1.4 WORKDAYS

Regular working hours will be defined in the Contract Documents. Changes thereto may be granted with written approval of the DPMC representative. Any work required to be performed after regular working hours or on Saturdays, Sundays, or legal holidays as specially set forth in the Contract documents, as may be reasonably required and consistent with contractual obligations, shall be performed at the amount set forth in the Contractor's bid without additional expense to the State. The Contractor shall obtain written approval of the DPMC representative for performance of work after regular working hours or on non-regular workdays at least forty-eight (48) hours prior to the commencement of overtime, unless such overtime work is caused by an emergency. If the Contractor seeks such approval for the overtime work, same shall be performed at no additional cost to the DPMC except in the event of an emergency, at which time, the DPMC, in its sole discretion, shall determine if the submitted overtime is compensable.

1.5 ASSIGNMENTS

The Contractor shall not assign all or any part of this Contract without the written consent of the Director. Money due (or to become due) the Contractor hereunder shall not be assigned for any purpose whatsoever without the written consent of the Director.

1.6 STATE SALES TAX

1.6.1 Materials, supplies or services for exclusive use in the construction of structures or buildings or otherwise improving, altering or repairing all State-owned property are exempt from the State sales tax.

1.6.2 Purchases or rentals of equipment are not exempt from any tax under the State Sales Tax Act.

ARTICLE 2 - OWNER/DPMC

2.1 DPMC'S REPRESENTATION

The DPMC will be represented on the Project by DPMC's designated representative(s). DPMC's designated representative(s) have only those duties that are required of the Owner under this Contract.

2.2 RIGHT TO PERFORM WORK

The DPMC may, and reserves the right to, enter upon the premises at any and all times during the progress of the Work, or cause others to do so, for the purpose of performing any work or installing any apparatus or carrying on any construction not included in the Contract Documents, or for any other reasonable purpose.

The DPMC shall have the right to defer the beginning of Work or to suspend the whole or any part of the Work whenever, in the sole discretion of the DPMC, it may be necessary or expedient for the State to do so.

2.3 MEANS AND METHODS

The State will not be responsible for, nor have control or charge of construction means, methods, techniques, sequences of procedures, or safety precautions and programs in connection with the Work. The State will not be responsible for, nor have control or charge of, the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other person performing any of the Work.

ARTICLE 3 - ARCHITECT/ENGINEER

3.1 DUTIES AND RESPONSIBILITIES

3.1.1 The Architect/Engineer ("A/E") is the consultant engaged by the DPMC to prepare the design and perform certain contract administration functions in accordance with the provisions of its contract with the DPMC.

3.2 PROGRESS MEETINGS

The Architect/Engineer will attend, chair and issue record minutes of bi-weekly job progress meetings.

3.3 SITE OBSERVATIONS

3.3.1 The Architect/Engineer will monitor the execution and progress of the Work. The Architect/Engineer will at all times be provided access to the Work. The Contractor shall provide facilities for such access so as to enable the Architect/Engineer to perform its functions.

3.3.2 The Architect/Engineer will not be responsible for, nor have control or charge of construction means, methods, techniques, sequences of procedures, or safety precautions and programs in connection with the Work. The Architect/Engineer will not be responsible for, nor have control or charge of, the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other person performing any of the Work.

3.4 SHOP DRAWINGS AND SUBMITTALS AND INVOICES

As more specifically described in Article 4, the Architect/Engineer will review, approve or take other appropriate action relating to Contractor's submittals, including shop drawings, product data and samples, and as – built drawings, to assure conformance with the requirements of the Contract. Such actions shall be taken with reasonable promptness. Approval of a specific item shall not indicate approval of an assembly of which the item is a component.

3.5 PAYMENT APPROVALS

3.5.1 The Architect/Engineer is responsible for the timely review of all invoices submitted by the Contractor. The Architect/Engineer shall inform the Contractor of any deficiencies therein. When the payment voucher is deemed accurate, the Architect/Engineer shall recommend approval of Contractor invoices.

3.5.2 The Architect/Engineer will review and recommend approval of Contractor closeout documentation in conjunction with the final application for payment.

ARTICLE 4 - THE CONTRACTOR

4.1 REVIEW OF THE CONTRACT DOCUMENTS AND FIELD CONDITIONS

4.1.1 The Contractor has the duty to thoroughly examine and be familiar with all of the Contract Documents and the Project site. The Contractor shall investigate and accurately determine the nature and location of the Work, the current building equipment and systems, labor and material conditions, and all matters which may in any way affect the Work or its performance.

4.1.2 The Contractor shall be deemed to have verified all reasonably observable conditions outside the Contract limit lines to determine whether any conflict exists with the Work that the Contractor is required to perform under the Contract. This includes but is not limited to a check on elevations, utility connections and other site data. If a condition changed from the time of the bid to the time of the issuance of the Notice to Proceed, the Contractor shall notify the Architect/Engineer immediately. The Contractor shall immediately report any conflicts prior to the bid proposal due date or waive any claim for additional compensation arising from such conflict.

4.1.3 During the progress of the Work, the Contractor shall immediately report in writing any alleged error, inconsistency, ambiguity or omission in the Contract Documents to DPMC. The Contractor shall not continue with any work that is affected by such alleged error, inconsistency, ambiguity or omission until the DPMC has had the opportunity to respond. Any error, inconsistency, ambiguity or omission shall be addressed pursuant to appropriate procedures set forth in these General Conditions.

4.1.4 Following notification of an alleged error, inconsistency, ambiguity or omission, the DPMC may issue supplemental instructions for the proper execution of the Work. The Contractor shall do no work without proper supplemental instructions. In giving such supplemental instructions, the DPMC will have the right to direct the Contractor to make minor changes in the Work without payment of additional monies. This provision is not intended to infringe upon or limit the DPMC's authority to otherwise direct changes in the Work, described elsewhere in these general conditions.

4.1.5 Where certain work is shown in complete detail, but not repeated in similar detail in other areas of the drawings, or if there is an indication of continuation with the remainder being shown only in outlines, the Work shown in detail shall be understood to be required in other like portions of the Project.

4.1.6 Unless otherwise directed in writing by the DPMC, the Contractor shall perform no portion of the Work without appropriate approvals as may be applicable and required by the Contract Documents.

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

4.2 INSURANCE

The Contractor shall secure and maintain in force, for the term of the Contract, insurance coverage provided in Section 13.4. The Contractor shall provide the State of New Jersey with current certificates of insurance for all coverage and renewals thereof which must contain a provision that the insurance provided in the certificate shall not be canceled for any reason except after thirty (30) calendar day's written notice to the State of New Jersey. If cancellation occurs, the Contractor shall immediately procure new coverage, not allowing any lapse of coverage to occur.

4.3 PERMITS, LAWS, AND REGULATIONS

4.3.1 The DPMC shall obtain and pay for the construction permits and inspections (building, plumbing, electrical, elevator and fire), required by the Department of Community Affairs (DCA). When permits are issued by DCA, the appropriate licensed Contractors and/or Subcontractors shall be required to fill out the Contractor section of the Sub-Code Technical Section and sign and affix their raised seal thereto.

4.3.2 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for all other permits and governmental fees, licenses and inspections necessary for the proper execution and completion of the Work, and which are legally required at the time of receipt of bids.

4.3.3 All work must be done in accordance with the NJUCC. No work requiring inspections and approval by construction NJUCC code officials is to be covered or enclosed prior to inspection and approval by the appropriate NJUCC enforcement officials.

4.3.4 The Work performed pursuant to this Contract is exempt from local ordinances, codes and regulations as related to the building and the Site on which it is located, except in certain limited circumstances, where construction could adversely affect adjacent property, public sidewalks and/or streets. In those instances, the Contractor shall coordinate its activities with municipal and/or highway authorities having appropriate jurisdiction.

4.3.5 Immediately upon receipt of the contract award documents from the DPMC, the Contractor shall notify all utility companies involved regarding utility services required for completion of the Work. Such notification shall be in addition to any notification requirements imposed by law, including, without limitation, the Underground Facility Protection Act, N.J.S.A. 48:2-73, et seq.

4.3.6 The Contractor shall perform all soil conservation measures in accordance with County Soil Conservation District requirements.

4.3.7 The Contractor shall perform all sewage disposal work in conformance with the regulations of the State's Department of Environmental Protection.

4.3.8 The Contractor shall be responsible for obtaining timely NJUCC inspections of the Work from the applicable State agency. The Contractor shall request such

inspections through DPMC authorized representatives allowing for sufficient notice to enable NJUCC inspections to be scheduled without delay to the Work.

4.3.9 Consistent with section 4.4 of these General Conditions, the Contractor shall be responsible for its own actions and protect, defend and indemnify the State from all fines, penalties or loss incurred for, or by reason of, the violation of any municipal ordinance or regulation or law of the State while the said work is in progress.

4.3.10 The Contractor shall comply with the Federal Occupational Safety and Health Act of 1970 and all of the rules and regulations promulgated there under.

4.3.11 If the Contractor causes a substantial violation of a State, local or federal statute or regulation on the Project, DPMC may declare the Contractor to be in default, and/or terminate the Contract.

4.3.12 Prior to the start of any crane equipment operations, the Contractor shall make all necessary applications and obtain all required permits from the Federal Aviation Administration (F.A.A.). When the F.A.A. has jurisdiction, the sequence of operations, timing and methods of conducting the Work shall be approved by the F.A.A.

4.3.13 The Contractor will establish an approved Silica Health and Safety Program when tasks generating crystalline silica dust are being performed. This program shall include engineering, work practice, and respiratory protection controls to reduce worker exposure to airborne respirable crystalline dust to levels that are as low as reasonably achievable. When tasks are performed that generate airborne crystalline dust, the Contractor will minimize worker exposure to dust by one, or a combination of the following methods: 1) dust suppression with water, 2) local exhaust ventilation to a high-efficiency dust collector, and/or 3) appropriate respiratory protection devices. The Contractor shall provide a trained, competent person, as defined by OSHA 29 CFR 1926, on site at all times to implement the Silica Health and Safety Program when tasks generating crystalline silca dust are being performed.

4.4 RESPONSIBILITY FOR THE WORK

4.4.1 The Contractor shall be responsible to the State and to any separate Contractors and/or consultants including, without limitation, the Architect/Engineer, for the acts, errors and omissions of its employees, Subcontractors and their agents and employees that injure, damage or delay such other Contractors and/or consultants in the performance of their work.

4.4.2 The Contractor shall be responsible for all damage or destruction caused directly or indirectly by its operations to all parts of the Work, both temporary and permanent, and to all adjoining property.

4.4.3 The Contractor shall, at its own expense, protect all finished work and keep the same protected until the Project (or identifiable portions thereof, that are declared as substantially complete and being used) is completed and accepted.

4.4.4 The Contractor shall be responsible for safety and for any damage or injury which may result from the Contractor's failure or improper construction, maintenance or operation.

4.4.5 In order to protect the lives and health of its employees, the Contractor shall comply with all applicable statutes and regulations and pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc. and shall maintain accurate records of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work arising out of and in the course of employment on work under the Contract. If a conflict should exist with the requirements of the Federal Occupational Safety and Health Act of 1970, then the most stringent statute or pertinent provision shall apply.

4.5 INDEMNIFICATION

4.5.1 The Contractor shall assume all risk of and responsibility for, and agrees to protect, defend and indemnify the State of New Jersey, its agents, and its employees, from and against, any and all claims, demands, suits, actions, recoveries, judgment and costs of expenses in connection therewith on account of the loss of life, property, injury or damage to the person, body or property of any person or persons whatsoever, resulting from the Contractor's performance on the Project or through the use of any improper or defective machinery, implements or appliances, or through any act or omission on the part of the Contractor or its agents, employees or servants, which shall arise from or result directly or indirectly from the Work and/or materials supplied under this Contract. This indemnification obligation is not limited by, but is in addition to, the insurance obligations contained in this Contract.

4.5.2 In any and all claims against the State or any of its agents or employees, any employees of the Contractor or Subcontractor or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this section shall not be limited in any way as to the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under worker's compensation acts, disability benefit acts, or other employee benefit acts.

4.6 SUPERVISION

4.6.1 The Contractor shall attentively supervise and direct the Work. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.

4.6.2 The Contractor shall employ a full-time competent superintendent and necessary foremen and assistants, who shall be in attendance on the Project Site during the progress of the Work. The superintendent shall represent the Contractor, and all communications given to the superintendent shall be binding upon the Contractor. The State reserves the right to require a change in superintendent if the superintendent's performance, as judged by the DPMC, is deemed to be inadequate. Upon application in writing, and if deemed appropriate and expressly approved by the DPMC, the requirement for a full-time superintendent may be waived. If such a waiver is permitted, the Contractor shall employ a full-time competent foreman who shall be in attendance on the site during the progress of work and shall represent the Contractor, and all communications given to the foreman

shall be binding upon the Contractor. The Contractor shall not employ persons unfit or unskilled in the assigned area of work.

4.6.3 The Contractor shall ensure that its Subcontractors shall likewise have competent superintendents in charge of their respective portions of the Work at all times. Upon application in writing, and if deemed appropriate and expressly approved by the DPMC, the requirement for a full-time superintendent may be waived. If such a waiver is permitted, the Subcontractor shall employ a full-time competent foreman who shall be in attendance on the site during the progress of work and shall represent the subcontractor, and all communications given to the foreman shall be binding upon the subontractor. The Subcontractor shall not employ persons unfit or unskilled in the assigned area of work. If it becomes apparent that a Subcontractor does not have its portion of the Work under control of a competent foreman, the Contractor shall have the obligation to take appropriate steps to immediately provide proper supervision.

4.6.4 The Contractor shall employ qualified competent craftsmen in their respective lines of work. The State may require evidence that all employees have received sufficient training to execute the Work.

4.6.5 If, due to a trade agreement or project labor agreement, standby personnel are required to supervise equipment installation or for any other purpose during the normal working hours of other trades, the Contractor normally required to provide the standby services shall be deemed to have evaluated and included the costs thereof in its bid price and shall provide said services without additional charge.

4.6.6 The Contractor shall at all times enforce strict discipline and good order among its employees and shall not employ any unfit person or anyone not skilled in the task assigned.

4.7 SHOP DRAWINGS AND OTHER SUBMITTALS

4.7.1 The Contractor shall, within two weeks of the Notice to Proceed, submit to the Architect/Engineer, shop drawings and sample submission schedule for approval, which shall be used as a basis for complying with the overall progress schedule. The Contractor shall obtain, from its Subcontractor(s), all submittals including shop drawings, details, and schedules. The Contractor shall review the submittals for completeness and conformity with the Contract Documents, and shall stamp the submittals “approved”. The Contractor shall promptly forward two copies of each submittals in reproducible form to the Architect/Engineer, so as to cause no delay in its own work or that of any other contractor The DPMC Project number and the drawing and specification references shall be written or typed on all submissions. Failure to comply with these instructions will be sufficient reason to return the drawing to the Contractor without approval and any resulting delay in the Project shall be the sole responsibility of the Contractor.

4.7.2. The Architect/Engineer will review shop drawings and other submittals with reasonable promptness. The Contractor shall promptly make any corrections, if required by the Architect/Engineer, and resubmit a reproducible copy for approval. Within five (5) working days of final approval, the Contractor shall send the Architect/Engineer a

minimum of seven (7) prints of the finally approved shop drawings as well as seven (7) copies of all catalog cuts.

4.7.3 The Contractor shall prepare original shop drawings, and not simply copy the Contract Drawings for submission as shop drawings. All shop drawing sizes shall be in multiples of 9" x 12" (e.g., 18" x 24", 24" x 27", 24" x 36", etc.) as approved by the Architect/Engineer.

4.7.4 Any deviations or changes from the requirements of the Contract Documents, must be approved by the Architect/Engineer. A Contractor seeking approval for any deviations or changes must: a) make a written request for the proposed change; b) provide to the Architect/Engineer a detailed narrative description of the proposed change; c) highlight on the applicable drawing the proposed change; and d) furnish a detailed description of all potential impacts on the schedule and project budget.

4.7.5 Substitutions

4.7.5.1 Where any particular brand or manufactured article is specified, it shall be regarded as a standard. Similar products of other manufacturers, capable of equal performance and quality, may be accepted if approved by the Architect/Engineer and accepted by DPMC in writing.

4.7.5.2 In the event that a Contractor proposes a substitution to the specified equipment or materials, it shall be the Contractor's responsibility to submit proof of equality and to provide and pay for any tests which may be required by the DPMC in order to evaluate the proposal. If there is a substantial cost savings between the substitution and the specified equipment or material, the difference will be returned to the State in the form of a credit Change Order.

4.7.5.3 The application for the approval of a substitution must be submitted on the State form within 10 days of Notice to Proceed. Further, the submission shall include the following requirements:

a. A Full and complete identification information;

b. The identification of the paragraph and section of the specifications for which the substitution is proposed. The attachment of data indicating in detail whether and how the equipment or material differs, if at all, from the article specified;

d. A detailed explanation of any effect the proposed substitution will have on the scope of the Work and a certification that the Contractor agrees to be responsible for any and all resulting added costs to its Work and to any additional costs incurred by the Architect/Engineer in time, labor and/or redesign of the Contract Documents;

e. The submission of documents that demonstrate proof of equality, along with an agreement to have such tests performed at the Contractor's own expense as may be required for approval by the DPMC and/or the Architect/Engineer. The Contractor shall be responsible for the cost of reviews by the Architect/Engineer of subsequent submissions of additional information.

4.7.5.4 No Contractor shall base a bid on a substitution that may have been approved on previous Projects. Bids shall be based solely on plans and specifications of this Project.

4.7.5.5 The Contractor shall not proceed with the purchase or installation of a substitution without the written approval of DPMC. Any such installation may result in the assessment of costs for its removal at the Contractor's expense, and/or other damages and/or termination of the Contract for default.

4.7.6 Additional Submissions

4.7.6.1 Samples: The Contractor shall furnish, for approval, all required samples. Such samples shall be submitted in accordance with the shop drawing and sample submittal schedule. All work must be installed in accordance with approved samples.

4.7.6.2 Utility Service Connections: With respect to plumbing, fire-protection, HVAC, electrical and other machinery and mechanical equipment items requiring utility service connections, the Contractor must submit the respective shop drawings with the manufacturer's certified rough-in drawings, indicating accurate locations and sizes of all service utility connections.

4.7.6.3 Sleeve and Opening Drawings: Prior to installing service utilities or other piping, through structural elements of the building, the Contractor shall prepare and submit, for approval by the Architect/Engineer, accurate dimensional drawings indicating the positions and sizes of all sleeves and openings required to accommodate the Work and installation of the Contractor's piping, equipment, etc. All such drawings must contain reference to the established dimensional grid of the building. Such drawings must be submitted in accordance with the approved shop drawing and sample submission schedule.

4.7.6.4 Control Valve and Circuit Location Charts and Diagrams: For all plumbing, fire-protection, HVAC and electrical work, the Contractor shall prepare a complete set of inked or typewritten control valve and circuit location diagrams, charts and lists identifying and locating all such items, and shall place the charts, diagrams and lists under frame glass in designated equipment rooms. The Contractor shall also furnish one-line diagrams, as well as such color-coding of piping, wiring and other necessary identifications as specified or required. This information is to be framed under glass and displayed where directed.

4.7.6.5 Coordination Drawings: The Contractor shall create and update a complete, composite set of Coordination Drawings. The purpose of these drawings is to identify coordination and interference problems prior to installation. Coordination Drawings are required for all equipment rooms, above ceiling spaces, shared chases, and other areas where the Work of two or more trades is to be installed. The drawings shall be drawn to a scale not smaller than 1/4"=1'-0" (30"x42" sheet size) and shall show clearly in both plan and elevation that all Work can be installed without interference. At a minimum these drawings shall indicate:

a. The interrelationship of equipment and systems;

b. Required installation sequences;

c. Equipment foundations and pads, equipment, piping, conduits, racks, ductwork, insulation, panels, control centers, sprinkler and fire protection systems etc. and required clearances.

The Contractor shall prepare the coordination drawings based on the submitted shop drawings and Contract Documents. The Contractor shall prepare, submit and receive approvals for the Coordination Drawings before any sleeves or inserts are set, any floor openings are core drilled, or any equipment, equipment foundations, or related work is installed. The cost of preparing approved Coordination Drawings shall be included in the Contractor's price. DPMC may require the Contractor to identify Coordination Drawings as an item within the Schedule of Values, and incorporate them into in the Project schedule.

4.8 AS-BUILT DRAWINGS

4.8.1 The Contractor and each Subcontractor shall maintain on the Project Site at all times one set of drawings to be marked "AS-BUILT." The DPMC has the right to rely on accuracy of the "as-built" drawings provided by the Contractor. During the course of the Project, the Contractor shall mark these drawings with colored pencils to reflect any changes, as well as the dimension and the location of all pipe runs, conduits, traps, sprinkler and fire protection lines, footing depths or any other information not already shown on the drawings or differing therefrom. All buried utilities outside the building shall be located by a survey performed by a licensed surveyor who shall certify as to its accuracy. These marked-up drawings and surveys shall remain current and shall be made available to the DPMC or Architect/Engineer at all times during the progress of the Work.

4.8.2 In instances where shop drawings and/or erection drawings, of a scale larger than the Contract Drawings, are prepared by the Contractor, such drawings may be acceptable "as-built" drawings provided they are updated. A master sheet of the same dimensions as the Contract Drawings shall be prepared by the Contractor that shall indicate, sheet by sheet, a cross-reference to all shop drawings pertaining to that drawing.

4.8.3 The Contractor shall submit the "as-built" documents to the Architect/Engineer with a certification as to the accuracy of the information thereon at the time of Contract completion and before final payment will be made to the Contractor. After acceptance by the Architect/Engineer, the Contractor will furnish two sets of all shop drawings used for "as-built" documentation.

4.8.4 All "as-built" drawings as submitted by Contractors shall be dated and labeled "AS-BUILT" above the title block. This information shall be checked, edited and certified by the Architect/Engineer, who will then transpose such information from the Contractor's "as-built" drawings to the original drawings. Where shop drawings have been used by the Contractor for "as-built" documentation, the master sheet providing cross reference information, as described in section 4.8.2, shall be included in the set of "as-built" drawings furnished to DPMC.

4.9 EXCAVATIONS, CUTTING AND PATCHING

4.9.1 Soil borings, test pits or other subsurface information may be secured by an independent Contractor retained by the State prior to design and construction of the Project and, if obtained, may be included in the Contract Documents for the Contractor's use. The Contractor assumes full responsibility for interpretation of said information.

4.9.2 The Contractor shall be responsible for furnishing and setting of sleeves, built-in items, anchors, inserts, and other necessary materials for its work and for all cutting, fitting, closing in, patching, finishing, or adjusting of its work in new and/or existing construction, as required for the completed installation.

4.9.3 Approval in writing from the DPMC and the Architect/Engineer must first be obtained by the Contractor before cutting or boring through any roof, floor beams, floor construction or structural members.

4.10 TESTING

4.10.1 The Contractor shall notify the DPMC in writing of all work required to be inspected or tested. The notice shall be provided no later than five working days prior to the scheduled inspection or test. The Contractor shall bear all costs of such inspections or tests, except for Code inspections as stated in section 4.3 of this document.

4.10.2 When mechanical, electrical or other equipment is installed, it shall be the responsibility of the installing Contractor to maintain, warrant and operate it for such period of time as required by the Contract Documents or as necessary for the proper inspection and testing of the equipment and for adequately instructing the State’s operating personnel. All costs associated with the maintenance, warranty, operations, inspection and testing of equipment, as well as instructing State personnel, shall be borne by the Contractor installing the equipment. All tests shall be conducted in the presence of, and upon timely notice to, the DPMC, prior to acceptance of the equipment.

4.10.3 DPMC shall have the authority to direct in writing that special or additional inspections or tests be performed. The Contractor shall comply and give notice as detailed above.

4.10.4 In the event such special or additional inspections or testing reveal a failure of the Work to comply with the terms and conditions of the Contract, the Contractor shall bear all costs thereof, including all costs incurred by the State made necessary by such failures.

4.10.5 The Contractor shall utilize inspection or testing from those firms/entities pre-qualified by DPMC. Failure to use a firm/entity pre-qualified by DPMC shall be grounds for rejection of the inspection or test as non-conforming.

4.10.6 All submittals of inspections, test reports or requests for approval shall be accompanied by a certification signed by the Contractor, attesting to: the Contractor's knowledge of the submittal; acceptance of its findings; acknowledgment that material testing meets the required standards; and a certification of the report's representation of

the facts. Failure to provide the written certification shall be grounds for rejection of the submittal.

4.10.7 The Contractor shall ensure that a copy of the inspection report is transmitted directly to the Architect/Engineer and the DPMC. The Contractor shall ensure that it includes in all of its subcontracts and purchase orders for inspection and testing, the requirement for the inspection or testing firm/entity to submit a copy of the report directly to the DPMC representative. The Contractor shall ensure that all such reports are submitted within fourteen (14) calendar days of the test or inspection.

4.10.8 In addition to tests performed by the Contractor, the State reserves the right to engage an independent testing agency or firm to perform testing inspections. The Contractor shall provide full access, provide samples, and cooperate fully with this testing agency.

4.10.9 Testing requirements for real property installed equipment (RPIE) to be furnished by the Contractor, when such testing is required by Code, Contract, or the manufacturer, shall be performed by a testing laboratory pre-qualified by DPMC, or in the absence of such, by the manufacturer or its authorized representative. The Contractor shall provide five working days' notice to the DPMC representative, to allow sufficient opportunity to witness the test.

4.10.10 The DPMC may order that any part of the Work be re-examined by the DPMC, and if so ordered, the Contractor shall open or uncover such work for re-inspection by the DPMC. If such work is found to be in accordance with the Contract, the DPMC shall pay the cost of re-inspection; however, if such work is not found to be in accordance with the Contract, the Contractor shall be responsible for the cost of re-inspection and replacement of any defective or non-conforming work.

4.11 EQUIPMENT AND MATERIALS

4.11.1 The Contractor warrants that all materials and equipment furnished under the Contract will be new, unless otherwise specified, and that all work will be of good quality, free from faults, defects, and installed in conformance with the Contract Documents. All work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective and rejected by the DPMC or the Architect/Engineer. If required by the Architect/Engineer or the DPMC, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty shall be in addition to but not in lieu of any other warranty or guarantee provided for in the Contract.

4.11.2 The Contractor shall submit to the Architect/Engineer an original and six copies of the request for approval of materials on the form provided by DPMC for approval. Each item of material listed shall be marked "As Specified", "Substitution" or "Unspecified" as appropriate.

4.11.3 The Contractor shall furnish and deliver the necessary equipment and materials in ample quantities and as frequently as required to avoid delay in the progress of the Work and shall store them so as not to cause interference with the orderly progress of the Project.

4.11.4 The Contractor shall furnish and pay for all necessary transportation, storage, scaffolding, centering, forms, water, labor, tools, light and power and mechanical appliances and all other means, materials and supplies for properly executing the Work under this Contract, unless expressly specified otherwise in the Contract Documents. The Contractor shall have its representatives at the Site to accept delivered materials. State agencies employees and/or representatives will not accept materials, nor will State agency employees and/or representatives be responsible for damage, theft, or disappearance of the Contractor's materials, equipment, tools, or other property.

4.11.5 Products manufactured in the United States shall be used in this work, whenever available. Wherever practicable, preference shall be given at all times to material and equipment manufactured or produced in the State of New Jersey, where such preference is reasonable and will best serve the interest of the State.

4.11.6 No materials, equipment, or supplies for the Work shall be purchased by the Contractor subject to any lien or encumbrance or other agreement by which an interest is retained by the seller. This clause shall be a condition included in all agreements between the Contractor and its Subcontractors. The Contractor warrants, by signing its invoice, that it has good and sufficient title to all such material, equipment and supplies used by it in the Work, free from all liens, claims or encumbrances.

4.12 TEMPORARY FACILITIES

The Contractor shall be responsible for providing for its own storage areas, employee vehicular parking and staging areas, excavation borrow/spoils designated areas, commercial canteen areas, and all other areas necessary for use by the Contractor. The Contractor shall locate these areas to suit Project requirements, subject to DPMC approval.

4.12.1 Field Offices - The Contractor will provide and maintain during the contract duration an on-Site suitable weather-tight insulated field office conveniently located, and shall maintain therein a complete set of Contract Documents including plans, specifications, CPM network diagrams, Change Orders, logs and other details and Project correspondence. Subject to the DPMC’s written approval and at a date designated by DPMC, the field office may be removed upon enclosure of the building and space may be allocated for field offices within the building. The contents and operations will be transferred to the interior of the Project building by the Contractor, and said office(s) shall be maintained by the Contractor until final acceptance or until the DPMC approves its removal. The Contractor will be responsible to obtain and pay for all permits required for the Contractor’s field offices.

4.12.2 Telephones - The Contractor shall provide its own telephones. The State will be responsible only for the cost of calls made by State employees. if there is a documented cost for same.

4.12.3 Storage - The Contractor will provide and maintain, for its own use suitable and safe temporary storage, tool shops, and employees' sheds for proper protection, storage work and shelter. The Contractor shall maintain these structures properly and remove the structures at the completion of work. The Contractor shall be responsible to maintain

these facilities and the areas around the facilities in a clear and clean manner. The Contractor shall be responsible for correcting defects and damage caused by such use. Rooms in buildings at the Project Site may be used as shops and storerooms, conditioned upon written approval from DPMC.

4.12.4 Toilet Facilities

a. The Contractor shall provide and pay for suitable temporary toilets at an approved location on the Site and prior to the start of any field work. The toilet facilities shall comply with federal, State and local laws and regulations. The Contractor will be responsible for maintenance, removal and relocation as described hereinafter.

b. The Contractor shall provide a temporary toilet and/or indoor toilet connected to water and sewer to accommodate the meeting room and the Architect/Engineer's office, as well as the DPMC office.

c. Toilets shall be serviced by a qualified and experienced firm authorized to maintain services.

d. Each portable toilet facility shall be maintained in a neat and clean condition and serviced at least twice a week, including the removal of waste matter, sterilizing, recharging tank, refilling tissue holders, and thoroughly cleaning and scrubbing entire interior.

e. Toilet facilities in a multiple-story building shall be located on no less than every other floor, unless otherwise directed in writing.

f. Toilet service shall be relocated inside the building and connected to water and sewer as the progress of the Work will allow.

g. When temporary toilets are connected to water and sewer lines, precautions shall be taken to prevent freezing.

h. The Contractor shall remove the temporary toilet units from the Work Site at the completion of the Work, or when so directed by the DPMC or the Architect/Engineer.

i. Workers are not to use the finished bathroom and toilet facilities in the Project buildings. Reasonable steps must be taken by the Contractor to enforce this rule.

4.12.5 Access, Roads and Walks

a. The Contractor shall be responsible for providing and maintaining unobstructed traffic lanes on the designated construction access routes shown on the Contract Drawings or as reasonably required so as to perform the Work. The Contractor shall provide and maintain all reasonably required safety devices. The Contractor shall provide any necessary additional materials, grading and compaction, and shall remove snow and debris as necessary to provide and maintain the access roadbed and pedestrian ways in serviceable condition.

b. The Contractor shall be responsible for constructing and maintaining all roadways, drives and parking areas within or proximate to the Site free and clear

of debris, gravel, mud, snow, ice, or any other Site materials, by ensuring that all reasonably necessary measures are taken to prevent such materials from being deposited on such surfaces. This includes, as may be appropriate, the cleaning of vehicle wheels and/or other necessary maintenance, prior to exit from the Construction Site. Should such surface require cleaning, the Contractor will clean these surfaces without additional cost to the State. The Contractor will be held accountable for any citations, fines, or penalties imposed on the State for failing to comply with local rules and regulations related to Site and off-Site maintenance.

c. The Contractor shall not commence final construction of permanent driveways, parking areas or walks without the written approval of the DPMC. The Contractor shall provide additional materials and labor for maintaining and reworking the sub-grade prior to completion of the Work, to ensure improvements conform fully to the specifications.

d. The Contractor shall obtain written permission from the State for the use of any existing driveways or parking areas not specifically designated for such use in the Contract Documents. If permission is granted, the Contractor shall maintain such driveways and areas in good condition during the construction period, and at the completion of the Project, shall leave them in the same or better condition as at the start of the Work. Conditions before use shall be carefully photographed and documented by the Contractor.

4.12.6 Light and Power

a. The Contractor shall extend electrical service to the building or buildings at locations approved by the DPMC. Temporary electrical service shall be independent of the existing permanent service. Initial temporary service shall be three phase or single phase as indicated in the Contract Documents. The Contractor is responsible to investigate and verify the appropriateness and availability of electrical service with the local utility company prior to the bid date. The Contractor's bid shall be deemed to include all costs associated with providing this power. Temporary light and power installations, wiring, and miscellaneous electrical hardware must meet the electrical Code and will be inspected by NJUCC officials. The Contractor shall provide the necessary distributing facilities and a meter, and shall pay the cost of running temporary services from the nearest utility company power pole. All costs shall be included in the Contractor's bid.

b. In the event that a water well is the source of water supply for the Project, the extension of electrical service shall include the necessary wiring of sufficient capacity to the location of the well for the operation of the well pump. Where service of a type other than herein mentioned is required, the Contractor requiring it shall install and pay all costs of such special service. The size and incoming service and main distribution switch and panel shall be sized as any service by NEC requirements.

c. The Contractor shall provide all electrical service for the operation of elevator equipment during construction.

d. The Contractor shall pay for the cost of all electric energy used on distribution lines installed.

e. The Contractor shall provide and pay for all maintenance, servicing, operation and supervision of the service and distribution facilities.

f. If the Contractor fails to carry out its responsibility in the supplying uninterrupted light and power as set forth herein, the Contractor shall be held responsible for such failure, and the DPMC shall have the right to take such action as is deemed proper for the protection and conduct of the Work. Any costs associated with DPMC obtaining or supplying light and power shall be deducted from any payment due to the Contractor.

g. The Contractor shall comply with the requirements of the Federal Occupational Safety and Health Act of 1970 with regard to temporary light and power.

4.12.7 Temporary Enclosures

Whenever necessary in order to maintain proper temperatures for the execution or protection of the Work, the Contractor shall furnish and maintain temporary enclosures for all openings in exterior walls that are not enclosed with finished materials. Temporary wood doors shall be provided at door openings.

4.12.8 Temporary Heating, Ventilation and Air Conditioning

a. Prior to Enclosure - Prior to the building being enclosed by walls and roof, if the outside temperatures falls below 45 degrees Fahrenheit (“F”) at any time during the day or night, and heat is required for work in progress or for its protection or curing, the Contractor shall furnish, at its expense, acceptable means to provide sufficient temporary heat to maintain a temperature required by the Work being performed but in no case less than 45 degrees F.

b. Generally Enclosed

(1) For the purposes of establishing the beginning of the Contractor's obligation to provide temporary heat, a building or major unit thereof shall be considered generally enclosed when (a) the exterior walls have been erected, (b) a temporary roof or permanent roof is installed and in a watertight condition, and (c) temporary or permanent doors are hung and window openings are closed with either permanent or temporary weather-tight enclosures. A major unit of buildings as referred to herein shall be: (a) an entire separate structure, or (b) a fully enclosed wing which shall have a floor area equal to at least 50% (fifty percent) of the total floor area of the Project.

(2) As soon as the DPMC determines that the building, or a major unit thereof, is "generally enclosed" by walls and roof, and when the outside temperature falls below 55 degrees F. at any time during the day or night, the Contractor shall furnish sufficient heat by the use and maintenance of LP gas heaters or other acceptable means to maintain a temperature of not less than 55 degrees F. within the enclosed area of the building at all

times, and shall remove such heaters when no longer required. The Contractor will be held responsible for providing temporary heat and for all damages resulting from freeze-ups, for the duration of the Project from the time the building is generally enclosed to final acceptance and occupancy. The Contractor shall remove soot, smudges, and other deposits from walls, ceilings, and all exposed surfaces which are the result of the use of heating equipment, including the permanent heating system, during the period of its use for supplying heat. The Contractor shall not do any finish work until the areas are properly cleaned. The Contractor shall provide or arrange, at its own expense, supervision of the heating equipment at all times prior to providing heat, using the permanent heating system. This obligation shall commence immediately after the acknowledged permanent enclosure of the building or buildings, as confirmed by the DPMC. The Contractor shall furnish and pay for all fuel for heat required during the period when the building is generally or permanently enclosed.

(3) The Contractor shall not assume that the permanent heating system or any part thereof will be available for furnishing of temporary heat during the period for which temporary heat is required. The Contractor's base bid price shall therefore include the cost of all equipment necessary for providing temporary heat as required by the Contract Documents. The Contractor may use the permanent heating system, with written approval from DPMC. Such use however does not cause to commence the equipment’s warranties and guarantees. The equipment’s warranties and guarantees shall not commence to run until the State takes beneficial use of the Project and facility for the purposes intended.

(4) All heating equipment shall be NFPA-approved and connected to approved flues to the atmosphere. Heaters shall be approved by a recognized testing laboratory and must be equipped with a positive shut-off safety valve.

(5) Storage of gas cylinders within the building will not be permitted at any time.

(6) The Contractor shall provide fire extinguishers on each floor where heaters are used, and the areas must be adequately ventilated.

c. Permanent Enclosure

(1) When the building enclosure has been confirmed by the Architect/Engineer has been completed in accordance with the Contract Documents, and to the satisfaction of DPMC, it shall be considered permanently enclosed. The Architect/Engineer will also confirm in the job meeting minutes that the building, or a major unit thereof, is permanently enclosed.

(3) The Contractor shall install adequate controls to make such temporary connection as required for the operation of the HVAC system.

Should the heating system be designed for the tie-in to existing steam lines for resource of heat, the State will provide steam for temporary heat through the Project permanent heating system, at no cost to the Contractor, after the tie-in is completed by the Contractor.

(4) When the building enclosure has been confirmed by the A/E as completed, the Contractor may request permission to operate the permanent HVAC system to meet its temporary HVAC obligation. The Contractor shall maintain a minimum temperature of 55 degrees F., or a higher temperature, not to exceed 75 degrees F., as may be directed by the Contract Documents for the proper conduct and protection of the Work. The Contractor shall do so until such time as its work is completed and accepted and the Contractor is relieved of this requirement in writing by the DPMC. The Contractor shall pay for and be responsible for the maintenance in accordance with the manufacturer's recommendations, operation and supervision of the HVAC system, including the cost of all water, electricity, and fuel, until the State assumes beneficial occupancy/use of the Project.

4.12.10 Temporary Water

a. The Contractor shall provide, protect and maintain an adequate valved water supply. If the source of water supply is a well, provisions covering the supply water will include the installation of necessary power-driven pumping facilities. The well shall be protected against contamination. The water supply shall be tested periodically by the Contractor, and if necessary, shall be chlorinated and filtered. All costs of providing water will be paid for by the Contractor.

b. The Contractor is responsible to protect all temporary and permanent water lines from damage or freezing. Should water connections be made to an existing line, the Contractor shall provide a positive shut-off valve at its own cost and expense.

4.12.11 Standby Personnel

If, pursuant to trade agreement to which the Contractor is a party, the Contractor is obligated, to employ standby personnel then the Contractor shall determine and include all such costs thereof in its bid proposal. The Contractor shall not, at any time, make a claim to the State for costs relating to standby maintenance or standby supervision for electric motor-driven or other equipment.

4.12.12 Dust Control

a. The Contractor shall provide and maintain necessary temporary dust-proof partitions around areas of Work in any existing building or in new building areas as directed by the Architect/Engineer or the DPMC.

b. The Contractor shall provide and maintain Site dust control of Projects with on-Site construction as directed by the Architect/Engineer or the DPMC.

4.13 STORAGE AND SITE MAINTENANCE

4.13.1 The Contractor shall confine its apparatus, the storage of its equipment, tools and materials, and its operations and workers to areas permitted by law, ordinances, permits, and Contract as set forth in the Contract Documents, the rules and regulations of the State, or as ordered by the DPMC. The Contractor shall not unreasonably encumber the Site or the premises with materials, tools and equipment.

4.13.2 The Contractor shall, at all times during the progress of the Work keep the premises and the job Site free from the accumulation of all refuse, rubbish, scrap materials and debris caused by its operations and/or the actions of its employees, Subcontractors and/or workers, to ensure that, at all times, the premises and Site shall present a neat, orderly and workmanlike appearance. This is to be accomplished as frequently as is necessary by the removal of such refuse, rubbish, scrap materials and debris from the Site and the State's premises. Loading, cartage, hauling and dumping of same will be at the Contractor's expense.

4.13.3 At the completion of the Work, the Contractor shall remove all of its tools, construction equipment, machinery, temporary staging, false work, mock-ups, form work, shoring, bracing, protective enclosures, scaffolding, stairs, chutes, ramps, runways, hoisting equipment, elevators, derricks, cranes, and any other materials and equipment brought onto the Project Site.

4.13.4 Should the Contractor not promptly and properly discharge its obligation relating to Site maintenance and/or final clean up, the State shall have the right to employ others and to charge the resulting cost to the Contractor after first having given the Contractor a three-working day written notice of such intent.

4.13.5 The Contractor's responsibilities for final clean up shall include:

a. Removal of all debris and rubbish resulting from or relating to the Contractor's work. Rubbish shall not be thrown from building openings above the ground floor unless contained within chutes.

b. Removal of stains from glass and mirrors. Glass shall be washed and polished inside and outside.

c. Removal of marks, stains, fingerprints, soil, dust or dirt from painted, decorated or stained woodwork, plaster or plasterboard, metal acoustic tile and equipment surfaces.

d. Removal of spots, paint and soil from resilient, glazed and unglazed masonry and ceramic flooring and wall work.

e. Removal of temporary floor protections; and cleaning, washing or otherwise treating and/or polishing, as directed, all finished floors.

f. Cleaning of exterior and interior metal surfaces, including doors, window frames and hardware, of oil stains, dust, dirt, paint, etc. Polishing and removal of fingerprints or blemishes from such surfaces shall be completed, as applicable.

g. Restoration of all landscaping, roadways and walkways to preexisting condition. Damage to trees and plantings shall be repaired in the next planting season, and such shall be guaranteed for one year from the date of repair and/or replanting.

4.13.6 All construction equipment, materials and/or supplies of any kind, character or description, regardless of value, which remain on the job Site for more than 30 (thirty) calendar days from the date of the Certificate of Final Acceptance, shall become the property of the State. Such construction equipment, materials and/or supplies will be disposed of in any manner the State shall deem reasonable and proper. The cost of this disposal will be deducted from any sums due the Contractor. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the State.

4.14 CUT-OVERS AND INTERRUPTIONS

All cut-overs of mechanical and electrical services to existing buildings shall be approved, scheduled and coordinated in advance with the DPMC's representative and performed at a time convenient to the occupants of said buildings so as not to unreasonably interfere with its operations.

4.15 PROTECTION/SAFETY

4.15.1 Safety Precautions and Programs – The Contractor shall be responsible for initiating, maintaining and supervising all required safety precautions and programs in connection with the Work. The Contractor shall designate a responsible member of its organization at the Site whose duty shall be the prevention of accidents. This person shall be competent to review, implement and coordinate the safety programs being performed as required by Occupational Safety and Health Administration (OSHA) or any other agency having authority over safety on a State Construction Site.

4.15.2 Protection of Persons

a. The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

(1) Every employee on the Site and all other persons who may be affected thereby;

(2) All the Work and all materials and equipment to be incorporated therein, whether in storage on or off the Site, under the care, custody or control of the Contractor, or any of its Subcontractor(s) or lower tier sub-Subcontractor(s); and

(3) Other property at the Site or adjacent thereto (whether owned by the State or not), including but not limited to trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

b. The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.

c The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including but not limited to rails, night-lights, aircraft warning lights, the posting of danger signs and other warnings against hazards, promulgating safety regulations, notifying Owners and users of adjacent utilities and other means of protection against accidental injury or damage to persons and property.

d. The Contractor shall not load or permit any part of the Work to be loaded so as to endanger the safety of the project, its employees, or any other person on the project Site.

e. The Contractor shall promptly remedy all damage or loss to any property caused in whole or in part by the Contractor, any of its Subcontractors, lower tier Subcontractors, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which the Contractor is responsible. These obligations are in addition to those stated elsewhere herein.

4.15.3 Protection of Property

The Contractor shall have full responsibility to install, protect, and maintain all materials and supplies in proper condition whether in storage or off the site and to immediately repair and/or replace any such damage until Final Acceptance. The Contractor shall maintain an inventory of all materials and supplies for the Work at the Site, that are delivered to the site, or delivered to approved off-site storage facilities. The State shall not be liable for any damage, theft or negligent injury to the Contractor's property.

4.15.4 Hazardous Materials

a. When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

b. The Contractor shall maintain all records, reports and files of the general storage and handling of hazardous materials as required by any and all federal, State and/or local regulatory agencies.

4.16.5 Emergencies

In any emergency affecting the safety of persons or property, the Contractor shall act with diligence to prevent threatening injury, damage or loss. In such case, the Contractor shall immediately, but in no case, not more than 24-hours following the emergency, notify the DPMC and the Architect/Engineer of the action taken.

4.16 UNCOVERING AND CORRECTION OF WORK

4.16.1 Uncovering of Work

a. The Contractor is obligated to provide reasonable notice to the DPMC and/or the Architect/Engineer of all work scheduled to be covered, to permit DPMC and the Architect/Engineer the opportunity to inspect the Work prior to actual covering. If any portion of the Work is covered prior to inspection by the DPMC or the Architect/Engineer, it shall be uncovered for observation. Uncovering and replacement of the covering shall be at the Contractor's expense.

b. The DPMC and/or the Architect/Engineer may request any work be uncovered by the Contractor for inspection. If such work is found to be in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be reimbursed to the Contractor. If such work is found not to be in accordance with the Contract Documents, the Contractor shall pay all associated costs.

4.16.2 Correction of Work

a. The Contractor shall promptly correct all work rejected by the DPMC or the Architect/Engineer as defective or failing to conform to the Contract Documents, whether observed before or after final acceptance and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected work, including the costs of all consultant services including but not limited to the Architect/Engineer's additional services.

b. The Contractor shall remove from the site, at its own expense, all portions of the Work which are defective or non-conforming and which have not been corrected, unless removal is waived by the DPMC.

c. If the Contractor fails to correct defective or non-conforming work in a reasonable time fixed by written notice from DPMC, then DPMC may make arrangements for such correction by others and charge the cost of so doing to the Contractor.

d. If the Contractor does not proceed with the removal and correction of such defective or non-conforming work within a reasonable time, fixed by written notice from the DPMC or the Architect/Engineer, any materials or equipment shall become the property of the State and the DPMC may remove and dispose the non-conforming work in any manner to best meet the interest of the State. If such material is sold and the proceeds of the sale do not cover all costs which the Contractor should have borne and any additional cost incurred by the State in the uncovering, removal, disposal and correction of non-conforming work, the difference shall be charged to the Contractor and an appropriate credit Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the State.

e. The Contractor shall be responsible for the cost of making good all work destroyed or damaged by such correction or removal.

f. Notwithstanding other obligations within the Contract Documents, nothing contained herein shall be construed to establish a time or date limitation upon which the DPMC must discover non-conforming work.

4.16.3 Acceptance of Non-Conforming Work

The DPMC may determine that the best interests of the State will be served by accepting defective or non-conforming work instead of requiring its removal and correction. In such instance, the DPMC may, by any means available, exact an appropriate reduction in the Contract sum. Such adjustment shall be effected regardless of final payment having previously been made, and the Contractor and/or its surety shall be responsible for promptly remitting any funds due the State as a result thereof.

4.17 LAYOUT AND DIMENSIONAL CONTROL

4.17.1 The Contractor shall be responsible for locating and laying out the building and all of its parts on the site, in strict accordance with the Contract Documents, and shall accurately establish and maintain dimensional control. The Contractor shall employ and pay for the services of a competent and licensed New Jersey engineer or land surveyor who shall be pre-qualified by DPMC to perform all layout work, and to test the level of excavations, footing base plates, columns, walls and floor and roof lines, and furnish to the Architect/Engineer, as the Work progresses, certifications that each of such levels is as required by the drawings. The plumb lines of walls, shall be tested and certified by the surveyor as the Work progresses.

4.17.2 The Contractor's engineer/surveyor, in the course of layout work either on the site or within any building, shall establish all points, lines, elevations, grades and bench marks for proper control and execution of the Work. The Contractor's engineer/surveyor shall establish a single permanent benchmark as set forth in the Contract Documents to which all three coordinates of dimensional control shall be referenced. The Contractor's engineer/surveyor shall verify all Owner-furnished survey data including but not limited to topographical and utility location points, lines, elevations, grades and benchmarks, and buildings. Should any discrepancies be found between information given on the Contract Documents and the actual site or field conditions, the Contractor shall notify DPMC and the Architect/Engineer in writing of such discrepancy, and shall not proceed with any work affected until receipt of written instructions from the DPMC.

4.18 PROJECT SIGN

The Contractor shall erect and maintain one sign at the Project Site, as set forth in the Contract Documents and located as directed by the Architect/Engineer. Painting shall be done by a professional sign painter, with two coats of exterior paint, colors, letter face and layout as shown. No other sign will be permitted at the site. Upon completion of the Project, and when directed by the Architect/Engineer or the DPMC, the Contractor shall remove the sign.

4.19 SECURITY

4.19.1 The Contractor shall provide all locks, doors and security construction and personnel as required to secure the Project building throughout the period of construction.

4.19.2 The Contractor shall be responsible for the security of any temporary structures located on the premises outside of the building and/or any stored materials.

4.20 DPMC FIELD OFFICE

4.20.1 The Contractor will provide on-site, suitable, separate, weather-tight, insulated (floor, walls, ceilings) field office facilities for the use of DPMC personnel, as more fully described in the Contract Documents. At a minimum, the Contractor is to supply this field office with toilet facilities, heating and air conditioning, tables and chairs, and phone and data communication lines. At a time determined by the DPMC or the Architect/Engineer, the Contractor shall remove field facilities upon enclosure of the Project building and shall relocate the contents and operations of the field office to the interior of the Project building until completion of the Project.

4.20.2 The Contractor shall be responsible for the maintenance of both offices and the meeting room, including the cost of heating, air conditioning, electric current, and janitorial service.

4.21 PHOTOGRAPHS

4.21.1 The Contractor shall submit monthly progress photographs in duplicate to the DPMC, giving six (6) views of the Work with each application for payment until the Project is completed,.

4.21.2 The photographs shall be 8" by 10" shall bear the date and time of the exposure, the DPMC Project number and title, the names of the Contractor and the name of the Architect/Engineer. All photographs shall also be submitted in digital format.

4.22 REPAIR OF FINISHED SURFACES, APPLIED FINISHES, GLASS

4.22.1 The Contractor accepts sole responsibility for repair of uncontrolled dislodging, cracking, delaminating or peeling of finished surfaces such as concrete, pre-cast concrete, cast and natural stone, unit masonry, millwork, plaster, glass and applied finishes such as compound, paint, and special coatings, within the Contract Work and the limits of specified guarantee periods, regardless of the cause.

4.22.2 The Contractor shall be responsible for replacement of all broken glass, regardless of the cause. The Contractor shall replace all broken, scratched or otherwise damaged glass before the completion and acceptance of the Work. If breakage is caused by the Owner, the Contractor will be reimbursed for the replacement costs. The Contractor shall wash all glass on both sides at completion, or when directed, removing all paint spots, stains, plaster, and other materials.

ARTICLE 5 - SUBCONTRACTORS

5.1 SUBCONTRACTORS AND MATERIAL SUPPLIER APPROVALS

5.1.1 Upon their execution, but not less than fourteen (14) calendar days prior to Subcontractor mobilization on the site, and/or Subcontractor billing, the Contractor shall forward to the Architect/Engineer on the form provided by the DPMC the names of all its Subcontractors and suppliers, of such others as the DPMC may direct, proposed to perform the principal parts of the Work. The Contractor shall forward the appropriate DPMC form to the Architect/Engineer for approval. Department of Labor Contractor Registration and New Jersey Business Registration Certificate are required for all Subcontractors.

5.1.2 If the DPMC has objection to any proposed or approved Subcontractor and/or material supplier, the Contractor shall substitute another Subcontractor and/or material supplier acceptable to DPMC. Under no circumstances shall the State be obligated for additional cost due to such substitution.

5.1.3 After the acceptance of bids, the Contractor shall make no substitution of any Subcontractor person or firm previously selected and approved, without prior written approval from the Architect/Engineer and DPMC. A Contractor seeking to substitute a Subcontractor person or firm shall provide written request for substitution no less than fourteen (14) calendar days prior to the execution of Work by the Subcontractor or material supplier.

5.1.4 Approval of a Subcontractor or material supplier by the DPMC and Architect/Engineer shall not relieve the Contractor of the responsibility of complying with all provisions of the Contract Documents. The approval of a Subcontractor or material supplier does not imply approval of any construction, material, equipment or supplies.

5.2 CONTRACTOR-SUBCONTRACTOR RELATIONSHIP

5.2.1 The Contractor acknowledges its full responsibility to the State for the acts and omissions of its Subcontractors and lower tier subcontractors, and of persons and firms either directly or indirectly employed by them, equally to the extent that the Contractor is responsible for the acts and omissions of persons and firms directly or indirectly employed by it. The Contractor acknowledges that it remains fully responsible for the proper performance of its Contract regardless of whether work is performed by the Contractor's own forces or by Subcontractors engaged by the Contractor.

5.2.2 Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the State. Further, no Subcontractor or material supplier shall be deemed an intended third party beneficiary under this Contract.

5.2.3 The Contractor and all Subcontractors agree that, in the employment of both skilled and unskilled labor, preference shall be given to residents of the State of New Jersey, if such labor force is available.

5.2.4 The Contractor shall require, in its agreements with Subcontractors and as a condition of agreement, that each Subcontractor require in its agreement(s) with lower tier Subcontractors and Suppliers, that the Subcontractor understands that there is no contractual obligation of any kind between the State and Subcontractor and the Subcontractor's sole recourse lies with the Contractor and/or the surety, and not with the State, that each Subcontractor and lower tier Subcontractor, bound by the terms of the Contract Documents for this Contract, and assume toward the Contractor all the obligations and responsibilities which the Contractor assumes, pursuant to the Contract Documents.

ARTICLE 6 - CONSTRUCTION PROGRESS SCHEDULE

6.1 GENERAL

The State may contract for the services of a Critical Path Method (CPM) scheduling consultant for Project planning, scheduling and cost control. If such has been arranged, then section 6.2 shall apply to the Contract between the State and the Contractor. In the absence of a statement in the bid documents that a CPM consultant has been retained by the State, then section 6.3 shall apply.

6.2 CONSTRUCTION PROGRESS SCHEDULE (CRITICAL PATH METHOD -- CPM CONSULTANT RETAINED BY THE STATE)

6.2.1 Critical Path Method

a. The Project will be monitored by a detailed critical path method scheduling system. This system shall be the basis for the evaluation of the Contractor's performance and for progress payments to the Contractor.

b. The Contractor shall provide all the information necessary for the CPM consultant employed by DPMC to develop a CPM network plan demonstrating complete fulfillment of all construction Contract requirements and, as necessary, for the CPM consultant to maintain an accurate CPM schedule throughout the Project. The Contractor, in consultation with the CPM consultant, will establish construction logic and activity time duration consistent with Contract documents and Project requirements. The CPM consultant will establish the level of detail to be reflected on the CPM schedule. The Contractor shall utilize the schedule in planning, coordinating and performing the Work, including all activities of Subcontractors, equipment vendors and material suppliers.

c. The Contractor agrees that the CPM consultant's Project network schedule is the designated plan for completion of all work in the allotted time, and the Contractor will assume full responsibility for the execution of the Work as shown. The Contractor shall indicate formal acceptance of the schedule by signing the final initial (baseline) network diagrams and computer schedule listing.

d. The Contractor shall furnish sufficient labor and construction equipment to ensure the execution of the Work in accordance with the approved CPM progress schedule. If, in the opinion of the DPMC, a Contractor falls behind the CPM progress schedule, the Contractor shall take any and all such steps as may be necessary to bring its work into compliance with the CPM progress schedule. The DPMC may require the Contractor to increase the number of shifts, days of work and/or the amount of construction labor, plant and equipment, all without additional cost to the State.

e. The Contractor shall make no claim for, and have no right to, additional payment or extension of time for completion of the Work, or any other concession because of any misinterpretation or misunderstanding on the Contractor's part of the CPM progress schedule, the Contractor's failure to attend the pre-bid

conference, or because of any failure on the Contractor's part to become fully acquainted with all conditions relating to the CPM progress schedule and the manner in which it will be used on the Project, or because of any Subcontractor's failure to properly participate in the development of a CPM progress schedule or to perform the Contract in accordance with the CPM progress schedule.

6.2.2 Initial Submittal

a. To the extent necessary for the CPM consultant to reflect in the network diagrams the plan for completion of this Contract, the Contractor shall meet with and assist the CPM consultant and furnish, within ten (10) calendar days after award of this Contract, all necessary information for the preparation of the CPM progress schedule. This information shall include, but not necessarily be limited to, a logical sequencing of work operations, activity time estimates, intended crew flow, activity costs and estimated manpower requirements for each activity.

(1) The network diagram shall show the sequence and interdependence of activities required for the Project. In preparing the network diagram, the Contractor shall assist the CPM consultant by breaking up the Work into activities of a duration of no longer than ten (10) working days each, except as to non-construction activities (such as procurement of materials, delivery of equipment and concrete curing) and any other activities for which the CPM consultant may approve the showing of longer duration. The diagram shall show not only the activities for actual construction but also such activities as the Contractor's submittal of shop drawings, templates and equipment, material fabrication, delivery of equipment and material, substantial completion, final completion, punch list and closeout, and the delivery of Owner-furnished equipment, if applicable. The Contractor shall provide activity durations to the CPM consultant for each activity on the diagram.

(2) If requested by the CPM consultant, the Contractor shall furnish any information needed to justify the reasonableness of activity time duration. Such information shall include, but not be limited to, estimated activity manpower, unit quantities, and production rates.

(3) Failure by either the Contractor or the CPM consultant to include any element of work required for the performance of the Contract shall not excuse the Contractor from completing all work required within any applicable date, notwithstanding DPMC approval of the network diagrams.

(4) The CPM consultant will establish the level of detail to be reflected in the CPM system.

(5) Seasonal weather conditions shall be considered in the planning and scheduling of all work influenced by high or low ambient temperatures for the completion of all Contract work within the allotted Contract duration. In addition, appropriate allowances shall be made for anticipated time losses due to normal rain and snow conditions based on

the previous five year average for that geographical area, by statistically expanding the estimated time duration for weather-sensitive activities, to ensure that the required completion date is achieved.

b. The Contractor shall be prepared to meet as many times as necessary with the CPM consultant to develop the information required for the timely development of the progress CPM schedule.

c. The Contractor shall furnish a breakdown of its total Contract price by assigning dollar values to each applicable network activity, coded for the Contractor and each Subcontractor, which cumulatively equals the total Contract amount. Upon acceptance by DPMC, the values will be used as a basis for determining progress payments. Progress payments to the Contractor shall be dependent upon final acceptance by DPMC of the cost-loaded progress CPM schedule.

d. Accompanying the network diagram and computer scheduling listing, the CPM consultant will furnish a computer-generated cost requisition listing, which will provide a separate tabulation of each activity shown on the CPM schedule in order of bid item or trade responsibility code as agreed to by DPMC. This listing will show, for each activity, the Contractor and each Subcontractor, the estimated dollar value of Work in place for totally or partially completed activities, including subtotals by bid items and grand totals for the entire Project. The cost requisition listing will also contain monthly activities reflecting the cost of Project overhead and administrative expenses, and activities reflecting the monthly cost of administering Project General Conditions.

6.2.3 Review and Approval:

a. After receipt of the initial network diagram, computer-produced schedule and cost requisition listing, the DPMC representative shall meet with the Contractor and CPM consultant for joint review, correction, or adjustment of the proposed plan and progress CPM schedule to evaluate the cost values assigned to each activity. Within ten (10) calendar days after the joint review, the CPM consultant will revise the network diagram and/or computer-produced schedule in accordance with agreements reached during the joint review, and shall submit two (2) copies each of the revised network diagram, computer-produced schedule and cost requisition listing to DPMC. The revised schedule documents will be reviewed by DPMC and, if found to be as agreed upon, will be approved. A copy of each will be returned to the CPM consultant for distribution and the CPM consultant shall forward same to the Contractor by email and/or overnight mail. The Contractor shall review these documents and shall indicate acceptance by signing the schedule documents. If the Contractor objects to the schedule documents, the Contractor shall forward these objections in writing to DPMC within ten (10) calendar days of the date of receipt of same or be deemed to have accepted the schedule documents. Objections shall include the precise activities of the schedule to which the Contractor objects and identify the basis of the objection. The Contractor will then meet with the DPMC representative and the CPM consultant to review the Contractor's objections. The CPM consultant may

revise the network diagram and the computer-produced schedule in accordance with the agreements reached during this final review and shall submit two (2) copies each of the revised network diagram, computer-produced schedule and cost requisition listing to DPMC. The re-submission will be reviewed by DPMC and, if found to be as agreed upon, will be approved and a copy of each will be returned to the CPM consultant for distribution and the CPM consultant shall forward same to the Contractor by email and/or overnight mail. The Contractor shall review these schedule documents to ensure that that the documents reflect all changes agreed upon, accept and sign. The Contractor shall indicate its acceptance by signing the scheduling documents, computer-produced schedule and cost requisition. Approval will be without reservation, and the Contractor will be deemed to have accepted the schedule as adequate, proper and binding in all respects and shall not raise further objections to the schedule.

b. After the network diagrams and computer-produced schedule have been signed by the Contractor, the CPM consultant shall forward to the Contractor and DPMC one set of copies of the network diagrams and computer-produced schedule. The network diagram and the computer-produced schedule with approved signatures shall constitute the Project work schedule until subsequently revised in accordance with the requirements of this section.

6.2.4 Progress Reporting and Changes:

a. Once every month, or more often if required by DPMC, the Contractor shall meet with the CPM consultant and DPMC's representative(s) and provide the information necessary for the CPM consultant to prepare and submit to DPMC a revised (updated) network diagram and computer-generated schedule listing showing:

(1) Approved changes in activity sequencing;

(2) Changes in activity duration for activities not started or partially completed where agreed upon;

(3) The effect on the network of any delays in any activities in progress, and/or the impact of known delays which are expected to affect future work;

(4) The effect of Contractor modifications (activity duration, logic and cost estimates) to the network;

(5) Changes to activity logic, where agreed upon, to reflect revision in the Contractor's work plan, i.e., changes in activity duration, cost estimates, and activity sequences for the purposes of regaining lost time or improving progress; and

(6) Changes to milestones, due dates, and the overall Contract completion date which have been agreed upon by DPMC since the last revision of the CPM schedule.

b. The CPM schedule shall accurately reflect the manner in which the Contractor intends to proceed with the Project and shall incorporate the impact of

all delays, Change Orders and change events as soon as these factors can be defined. All changes made to the schedule shall be subject to approval by DPMC prior to inclusion in the CPM schedule. If the DPMC representative and the Contractor are unable to agree as to the amount of time to be allowed for Change Order work, or the manner in which the Work is to be reflected on the network diagram, the CPM consultant will reflect the logic and time duration furnished by the Contractor for the Change Order work pending final DPMC decision. If non-approved Contractor logic and time durations are used, the Contractor agrees that any time which is projected to be lost on the Project as a result of these schedule changes will be considered the responsibility of the Contractor until a final agreement has been made or a final decision rendered by DPMC regarding the manner in which the Change Order work is to be reflected on the schedule. When this final decision has been made by DPMC, the CPM consultant shall revise the CPM schedule in accordance with such decision and issue a final analysis of the effect of the change on the Project.

c. If the Contractor desires to revise the logic of the approved progress CPM schedule to reflect a sequence of construction that differs from that to which was previously agreed, the Contractor must first obtain the approval of DPMC.

(1) Once each month, at the same time the network is updated, the CPM consultant, the Contractor and the DPMC representative(s) shall jointly make entries on the preceding network diagram schedule to show actual progress, identify those activities started by date and those completed by date during the previous period, show the estimated time required to complete each activity started but not yet completed, show activity percent completed and/or dollars earned, and reflect any changes in the network diagram approved in accordance with the preceding paragraph. After completion of the joint review and DPMC's approval of all entries, the CPM consultant will submit updated network diagrams, an updated computer-produced calendar-dated schedule and cost requisition listing to DPMC.

(2) The resultant monthly CPM computer printout and network diagrams shall be recognized by the Contractor as its sole updated construction schedule to complete all remaining Contract work.

(3) In addition to the foregoing, once each month the Contractor will receive a narrative report prepared by the CPM consultant. The narrative report will include a description of the amount of progress made during the last month in terms of completed activities in the plan currently in effect, a description of problem areas, current and anticipated delaying factors and the estimated impacts the delays have on the performance of other activities and completion dates, and recommendations on corrective action for the Contractor. Within seven (7) calendar days after receipt of this report, the Contractor shall submit to DPMC a written explanation of corrective action taken or proposed. The DPMC, after reviewing the written submission, may take appropriate action.

6.2.5 Payments to Contractor

a. The monthly submission of the computer-produced calendar-dated schedule shall be an integral part and basic element of the estimate upon which progress payments shall be made pursuant to the provisions of Article 9 of these General Conditions. The Contractor shall be entitled to progress payments only upon receipt by DPMC of an updated computer-produced calendar-dated schedule and cost requisition listing.

b. Payments to the Contractor shall be based upon the results of the computer-generated cost requisition listing which shall be prepared in conjunction with each updating of the CPM system as described above. The Contractors shall provide sufficient documentation to confirm reported progress for any cost items appearing in the scheduling and requisition system.

c. Payments to the Contractor shall be dependent upon the Contractor furnishing all of the information which, in the judgment of DPMC, is necessary to ascertain actual progress, and all the information and data necessary to prepare any necessary revisions to the computer-produced calendar-dated schedule, cost requisition listing and/or the network diagram. DPMC's determination that the Contractor has failed or refused to furnish the required information shall constitute a basis for withholding payments until the required information is furnished and the schedule and/or diagram is prepared or revised on the basis of such information.

6.2.6 Biweekly Progress Meetings

a. Every two (2) weeks or as otherwise directed by DPMC, the Contractor shall attend a coordination and CPM scheduling meeting on the job site. At this meeting, the Contractor shall provide detailed information regarding the Work schedule to be performed during the upcoming two weeks to permit the CPM consultant to prepare schedules for the subsequent two week period. Biweekly scheduling by the Contractor shall be in accordance with the priorities and degree of concurrent work required by the official CPM schedule for the Project. The Contractor shall be prepared to explain any difference between the Contractor's biweekly schedules and the priorities required by the latest updating of the official CPM schedule.

b. At the biweekly scheduling meeting, the CPM consultant shall review the schedule for the preceding two (2) weeks, and the Contractor shall report the progress actually achieved for each activity which was scheduled to be performed during the two weeks, including the actual dates on which the Work was performed. The Contractor agrees that this information shall constitute the official historical record of Project progress.

c. At each biweekly scheduling meeting, the Contractor shall document any current delays to work operations. In addition, the Contractor shall provide any available information regarding any potential delays.

(1) Following the biweekly scheduling meeting, the CPM consultant will issue to the Contractor a two-week look-ahead schedule as developed

at the meeting that shall constitute the construction schedule for the coming two weeks. The CPM consultant will also issue a narrative biweekly progress analysis documenting progress achieved during the preceding two weeks and analyze delays reported to constitute current or anticipated impacts to timely construction.

(2) The Contractor shall be represented at the biweekly scheduling meeting by its superintendent, who shall have complete authority to provide the information required for the development of the next two (2) weeks schedule, which includes documentation of past progress and documentation of delays. The Contractor's representatives shall also be authorized to commit to the implementation of corrective action planned to overcome delaying conditions.

6.2.7 Responsibility for Completion

a. The Contractor agrees that, when it becomes apparent from the current project CPM schedule that any Contract completion date will not be met, the Contractor will take any or all of the following actions, as required, at no additional cost to the State:

(1) Increase construction manpower.

(2) Increase the number of working hours per shift, shifts per working days, working days per week, or the amount of construction equipment, or any combination of the above; and/or

(3) Reschedule activities to achieve maximum practical concurrence.

6.2.8 Adjustment of Contract Completion Date

a. The Contract completion dates will not be adjusted except under the specific and limited conditions set forth in the Contract Documents. In the event that the Contractor requests an extension of any Contract completion date, the Contractor shall furnish a justification of such extension and provide any and all supporting evidence that DPMC requires to evaluate the Contractor's request. The DPMC shall either approve, in whole or in part, or reject the Contractor's request and will advise the Contractor in writing of its decision. If the DPMC finds that the Contractor is entitled to any extension of any Contract completion date under the provisions of this Contract, the determination as to the total number of calendar days extension permitted shall be based upon the currently approved Project CPM schedule and on all data relevant to the extension request. Such data will be included in the next updating of the CPM schedule.

b. The Contractor acknowledges and agrees that the evaluation of Project delays and determinations regarding Project time extension will be based upon the Project CPM schedule and the following criteria:

(1) Float time shown on the Project CPM schedule is not for the exclusive use of either the Contractor or DPMC. It is agreed that float time is available for use by all performing Work on the Project, including the Contractor, other contractors, subcontractor, lower tier subcontractors,

and suppliers to facilitate the effective use of available resources and to minimize the impact of problems of Change Orders which may arise during construction. The Contractor specifically agrees that float time may be used by DPMC or its representatives or consultants in conjunction with the review activities or to resolve Project problems. The Contractor agrees that there will be no basis for a Project time extension as a result of any Project problem, Change Order or delay which only results in the loss of available positive float on the Project CPM schedule. The Contractor further agrees that there will be no basis for a claim for cost escalation for any activity which is completed on or before its initially required late end date as shown on the initial approved Project CPM schedule, regardless of the justifiability or any delaying factors which might have resulted in the elimination of float which was originally available for the activity. If the Contractor refuses to perform work that is available to it, the DPMC may consider, the Contractor to be in breach of the Contract, regardless of the float shown to be available for the Work. In such instances, the DPMC may, without prejudice to any other right or remedy, declare the Contractor to be in default and terminate the employment of the Contractor pursuant to Article 12 of the General Conditions.

(2) The Contractor agrees that no time extension will be granted for time lost due to normal seasonal weather conditions. In order to qualify for consideration for a time extension due to adverse weather conditions, it must be shown by clear and convincing evidence that the weather conditions during a given quarterly period (summer, fall, winter, spring) were more severe than the previous five-year (5) average for the Project geographical area, and that these weather conditions critically impacted the final Project completion date by delaying the performance of work on the main Project critical path. If abnormal weather losses can be shown to have affected the Project critical path, a non-compensable time extension will be considered for that portion of the proven weather-related delays, which exceeded normal weather losses that should have been anticipated for the quarterly period in question.

(3) No time extensions will be considered for any weather conditions that do not affect work on the Project critical path as set forth on the current Project CPM schedule. The Contractor agrees that there will be no basis for a claim for any additional compensation resulting from any time extension issued for weather-related delays.

(4) In order for a given cause (i.e., delay, Change Order, etc.) to be considered as a basis for a total Project time extension, it must meet both of the following criteria:

(a) It must be totally beyond the control of the Contractor and due to no direct or indirect fault of the Contractor; and

(b) It must result in a direct delay to work on the main Project critical path.

(5) The Contractor acknowledges and agrees that actual delays to activities that, according to the Project CPM schedule, do not directly affect the main Project critical path and do not have any effect on the Contract completion date or dates, will not be the basis for a change therein.

(6) Concurrent delays are defined as two or more delays or areas of work slippage that are totally independent of one another and which, if considered individually, would each affect the final Project completion date according to the Project CPM schedule. Where the CPM consultant determines that concurrent delays exist, the Contractor acknowledges and agrees that the following criteria will be used to evaluate time extension:

(a) If the current Project CPM schedule shows two (2) or more concurrent delays, with one analyzed to be the responsibility of DPMC and the other analyzed to be the responsibility of the Contractor, a non-compensable time extension will be considered only if the excusable delay affects the main Project critical path and this delay is shown to be a greater amount than the other concurrent delays when the impacts of the concurrent delays are independently considered. In this event, a compensable time extension will be considered only for that portion of time by which the excusable delay exceeds all concurrent non-DPMC caused delays. For example, if an excusable impact delays the Project by one-hundred (100) calendar days and concurrent contract-caused slippage independently delays the final completion date by ninety (90) calendar days, a time extension will only be considered for a maximum of ten (10) calendar days, provided the excusable delay is on the project critical path.

(b) If the CPM schedule shows concurrent delays with some excusable delays and some the fault of the Contractor, and if the Contractor-caused delays are analyzed to be the main determining impact to the main Project critical path, then there will be no basis for a total Project time extension regardless of the nature of the concurrent excusable delays. A concurrent time extension may, however, be considered for that portion of the total Project slippage which is shown on the CPM schedule to be totally attributable to excusable delays.

(c) If a time extension request is being made for concurrent delays which did not affect the Project critical path, this must be clearly stated in the Contractor's time extension request and all CPM activities which are claimed to have been affected by the cited delay must be specifically identified with all applicable impact dates.

6.3 CONSTRUCTION PROGRESS SCHEDULING PROVIDED BY THE CONTRACTOR

6.3.1 The Project shall be completed within the specified number of calendar days from the effective date of the Notice to Proceed.

6.3.2 The Contractor shall be responsible for preparing and furnishing to the DPMC through the Architect/Engineer before the first Contract requisition date, but in no event later than 30 (thirty) days after the effective date of the Notice to Proceed, a coordinated combined progress schedule that incorporates the progress schedules of the Contractors and all Subcontractors engaged on the Project. The schedule shall be in the form of a network diagram or other recognized graphic critical path progress schedule format that indicates, among other things, predecessor and successor activities, and major and intermediate milestones, in sufficient detail to satisfy the DPMC. (See also section 6.3.4 below.) The Contractor's initial invoice will not be processed by the DPMC until and unless such a single coordinated progress schedule has been submitted to and approved by the DPMC. Thereafter, the Contractor shall submit an updated coordinated progress schedule on a monthly basis. Receipt and approval of the updates will be a mandatory condition to payment.

6.3.3 Once each month, or more often if required by the DPMC, the Contractor shall meet with the Architect/Engineer and the DPMC representative to gather the information necessary for the Contractor's preparation of the revised/updated computer generated scheduling reports.

6.3.4 The progress schedule, based upon the logic and time estimates, shall indicate in suitable detail for display, all significant features of the Work of the Contractor and each Subcontractor, including but not limited to, the placing of orders, manufacturing durations, anticipated delivery dates for critical and long-lead items, submissions and approvals of shop drawings, construction activities, all work activities to be performed by the Contractor and its Subcontractors, the beginning and time duration thereof, and the dates of all milestones, substantial and final completion of the various elements of the Work, including punch list and close-out. Reports shall be in booklets, indexed and separated as categorized below. Each activity listed on the Schedule shall include, as a minimum, the following:

a. The activity description;

b. The trade (A/E, Owner, GC, Electrical, Plumbing, HVAC);

c. The duration in calendar days;

d. The Early Start date;

e. The Late Start Date;

f. The Early Finish date;

g. The Late Finish date;

h. The Total Float

6.3.5 The Contractor agrees that no time extension will be granted for time lost due to normal seasonal weather conditions. In order to qualify for consideration for a time extension due to adverse weather conditions, it must be shown by clear and convincing evidence that the weather conditions during a given quarterly period (summer, fall, winter, spring) were more severe than the previous five-year (5) average for the Project geographical area, and that these weather conditions critically impacted the final Project completion date by delaying the performance of work. If abnormal weather losses can be shown to have impacted the Project completion date, a non-compensable time extension will be considered for that portion of the proven weather-related delays, which exceeded normal weather losses that should have been anticipated for the quarterly period in question.

6.3.6 Immediately upon approval by DPMC, the Contractor shall prepare and distribute four copies of the progress schedule to the DPMC plus two copies to the Architect/Engineer. Each monthly updated coordinated schedule shall be signed and dated by the Contractor.

6.3.7 The Contractor shall furnish sufficient labor and construction plant and equipment to ensure the execution of the Work in accordance with the approved progress schedule. If any updated completion time or date for any activity does not conform to the durations or milestones shown in the approved progress schedule, the sequence of activities and/or the time for performance of activities shall be updated on the progress schedule to be approved by the DPMC and cured by the Contractor by any means, including performing concurrent operations, additional manpower, additional shifts, and overtime. No additional charges to the State will be allowed the Contractor for overtime, additional manpower, equipment, additional shifts, etc. (except as may be provided elsewhere in the Contract), if such expediting procedures or measures are necessary to meet the Contract completion date.

6.3.8 The progress schedule shall show:

a. Recommended Changes in activity sequencing;

b. Changes in activity duration for activities not started or partially completed, where agreed upon;

c. The effect on the network of the modifications (activity duration, Predecessors and Successors);

d. Changes for the purposes of regaining lost time or improving progress, and;

e. Changes to milestones, due dates, and the overall Contract completion date, which have been agreed upon by the DPMC's project manager since the last revision of the progress schedule.

6.3.9 The progress schedule shall accurately reflect the manner in which the Contractor intends to proceed with the Project and shall immediately incorporate and reflect the impact of all delays and change orders. All changes made to the schedule shall be subject to approval by the DPMC.

6.3.10 The DPMC will not authorize or approve any claims for additional payment or extension of time for completion of the Work, or any other concession because of any alleged misinterpretation or misunderstanding on the Contractor's part of the Project schedule, the Contractor's failure to attend the pre-bid conference, because of any failure on the Contractor's part to become fully acquainted with all conditions relating to the Project schedule and the manner in which it will be used on the Project, or because of any other failure by the Contractor to properly participate in the development of a progress schedule or to perform the Contract in accordance with the progress schedule.

ARTICLE 7 - TIME OF COMPLETION

7.1 CONTRACT DURATION/NOTICE TO PROCEED

7.1.1 Contract duration shall commence on the effective date set forth on the written Notice to Proceed. The Notice to Proceed will be issued by the DPMC after the DPMC's receipt and acceptance of properly executed Contract Documents, including performance and payment bonds, proof of insurance and permit technical information submitted by the Contractor and/or Subcontractors. The Contractor shall not be entitled to delay, disruption, acceleration or any other claims arising from a deferred issuance of the Notice to Proceed.

7.1.2 The Contractor shall perform no work at the Contract Site prior to the issuance of the Notice to Proceed.

7.2 SUBSTANTIAL COMPLETION

7.2.1 At the request of the Contractor, the Architect/Engineer or the DPMC, the Contractor and the DPMC representative may make a joint inspection of the Work for the purpose of determining if the Work is substantially completed in accordance with the definition provided in Article 1. If DPMC, in its sole discretion, finds that the Work is substantially complete, then the DPMC will issue a written Notice of Substantial Completion for Beneficial Use. Such Notice shall in no way relieve the Contractor of any contractual obligation(s) or relieve the Contractor from responsibility to promptly complete all remaining Contract Work including, but not limited to, punch list items.

7.2.2 The standard guarantee period for equipment, workmanship and materials shall commence on the date DPMC issues the Notification of Substantial Completion for Beneficial Use, or from the time of completion and acceptance of equipment, work or materials in question, whichever is later.

7.2.3 In the event that the Project is completed in phases or stages, and/or in the event that the DPMC takes possession of any part of the Work pursuant to Section 7.4 of these General Conditions, no part of the Project shall be deemed substantially complete for purposes of the New Jersey Statute of Repose, N.J.S.A. 2A:14-1.1, prior to the issuance of a formal Notice of Substantial Completion for Beneficial Use for the all of the Work.

7.3 FINAL COMPLETION

7.3.1 Final completion of the Contract shall occur when:

a. The DPMC and the Architect/Engineer have determined that the punch list has been completed;

b. The Contractor has complied with the Contract Document's closeout requirements;

c. The Contractor has submitted all Contract deliverables as required by the Contract Documents including but not limited to the following: "as-built"

documents, operating and maintenance manuals, attic stock, parts lists, repair source lists, training and certificates; and

d. The Contractor has submitted all warranties, guarantees and/or maintenance bonds required under the Contract.

7.4 PARTIAL OCCUPANCY FOR USE

7.4.1 Use and possession prior to completion: The DPMC shall have the right to take possession or use of any completed or partially completed part of the Project. Said possession or use shall not be deemed acceptance of the Work performed on the Project.

7.4.2 Prior to such possession or use, the DPMC shall furnish the Contractor with an itemized list of Work remaining to be performed or corrected on such portions of the Project that are to be possessed or used by the State. Failure by the DPMC to list any item of work shall not be deemed an acceptance of any Work under the Contract.

7.4.3 The Contractor shall not be entitled to recovery of money damages for any delays, disruptions or inefficiencies caused by such partial occupancy.

7.5 DELAY, DISRUPTION AND INTERFERENCE

7.5.1 Delay - Time Extension. If the Contractor's work is delayed, disrupted or interfered with by act, neglect or default of any party, including the State, the Architect/Engineer, or by strikes, lockouts, fire, unusual delay by common carriers, natural disasters, or by any cause for which the Contractor is not responsible; then for all such delays and suspensions, the Contractor shall be allowed one (1) calendar day addition to the time herein stated for each and every calendar day of such delay so caused in the completion of the Work as specified above, the same to be determined by the DPMC. No such extension shall be granted for any delay unless, within ten (10) calendar days after the beginning of such delay, a written request for additional time shall be filed with the DPMC.

7.5.2 Contractor's Damages for Delay, Disruption or Interference

The Contractor shall not be entitled to recovery of money damages from the DPMC caused by delay, disruption or interference with the Contractor's Work except as expressly provided under section 7.5.2 of these General Conditions paragraph. The Contractor expressly agrees that the Contractor's remedy for delay, disruption of interference shall be limited to an extension of time only and that there shall be no recovery of money damages by the Contractor for any delay, disruption or interference with the Contractor's work attributable to any cause whatsoever (other than the State's negligence, bad faith, active interference or other tortuous conduct). The Contractor expressly agrees that it shall not be entitled to recover damages due to delay, disruption or interference caused by any of the following:

a. Delayed execution of the contract or any of the causes referenced in paragraph 7.5.2;

b. Any act or omission by any party other than the State, including, but not limited to, the Architect-Engineer, any other Contractor or Subcontractor, any

CPM or other consultant retained by the State, any construction manager retained by the State, any agency or instrumentality of the federal government or of any local governmental entity or any utility (e.g., gas, electric, telephone, cable);

c. Any act or omission of any agency or instrumentality of the State , other than the DPMC, including, without limitation, the Department of Environmental Protection and the Department of Community Affairs;

d. Weather;

e. Subsurface conditions of any type including, without limitation rock and underground utilities, whether or not such conditions were reasonably ascertainable to the Contractor at the time of bidding;

f. Use of all or any portion the Project premises prior to completion of the Work to the extent that such use is permitted under the terms of the Contract;

g. Delay in obtaining any permit or approval;

h. Delay caused by the issuance of any court order, injunction or restraining order;

i. Any delay which does not entitle the Contractor to an extension of the Contract Completion Time under Section 6.2.8 of these General Conditions; or

j. Delay attributable to any other cause, other than a cause for which the State is legally restricted from enforcing a contractual "no damage for delay" clause under N.J.S.A. 2A:58B-3 or any other provision of law restricting or barring the enforcement of such clauses.

In interpreting this provision, the negligence or other wrongful conduct of others, including, without limitation, the Architect/Engineer, the CPM consultant, any construction management firm and any other firm or person retained by the State shall not be imputed to the State. Further, to the extent that the Contractor is entitled to recover monetary damages for delay under this Contract, such recovery shall be limited to actual direct costs incurred on account of the delay, and shall not include profit or other markup on such costs, home office overhead calculated under the Eichleay formula or any other kind of consequential or indirect cost or damage, including but not limited to any alleged cost or damage under the total cost method, the modified total cost method, or productivity factors (costs for inefficiency based on industry productivity factors such as those provided by the Mechanical Contractors Association of America (MCAA) Factors Affecting Labor Productivity).

7.5.3 In the event of the failure of the Contractor to complete its work within the time stated in its Contract, the Contractor shall be liable to the State in the sum as set forth as liquidated damages in the Contract, for each and every calendar day that the Contractor fails to attain contract completion of the work. This sum shall be treated as liquidated damages to compensate for the loss to the State of the use of premises in a completed state of construction, alteration or repair, and for added administrative and inspection costs to the State on account of the delay; provided, however, that the said liquidated damages shall be in addition to other compensatory or consequential losses or damages

that the State may incur by reason of such delay, such as, but not limited to, added costs of the Project and the cost of furnishing temporary services, if any. Any such sums for which the Contractor is liable may be deducted by the State from any moneys due or to become due to the Contractor.

7.5.4 It is hereby understood and mutually agreed by and between the Contractor and the State that the start date in the Notice to Proceed, the dates of all required intermediate milestones, and the times for substantial and final completion, as specified in the Contract Documents, are essential conditions of this Contract.

7.5.5 The Contractor agrees that said work shall be executed diligently, at such rate of progress as will ensure full completion of the Work within the time specified. It is expressly understood and agreed, by and between the Contractor and the State, that the time for the completion of the Work herein is a reasonable time, taking into consideration the average climactic range and usual industry conditions prevailing in this locality. If the said Contractor shall neglect, fail or refuse to complete the Work within the time herein specified, or any proper extension thereof granted by the DPMC, then the Contractor does hereby agree, as a part of the consideration for the awarding of its Contract, to pay the State the amount specified in section 7.5.3 above, as liquidated damages for loss of use of the Project as hereinafter set forth, for each and every calendar day that the Contractor may have exceeded the stipulated date in the Contract for substantially completing the Work.

7.5.6 It is further agreed that time is of the essence of each and every portion of this Contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any Work, the new time limit fixed by such extension shall similarly be of the essence.

ARTICLE 8 - CLOSE-OUT

8.1 CLOSE-OUT PROCEDURES/FINAL PAYMENT

As part of the final completion procedures described in Article 7 and the requirements for payment as described in Article 9, the Contractor must complete all of the Close-out procedures as follows:

a. Submit the "as-built" record documents as described in Article 4;

b. Submit all operating and maintenance manuals, parts lists, repair source parts, and certificates as defined in 8.2 below;

c. Provide the necessary training for operating systems and equipment as defined in 8.3 below; and

d. Submit all guarantees as defined in 8.4 below.

8.2 OPERATIONS, EQUIPMENT AND MAINTENANCE MANUALS

8.2.1 The Contractor shall provide six (6) copies of all operating, equipment and maintenance manuals, and applicable warranties, as identified and described in the Contract Documents. The operating, equipment and maintenance manuals and warranties, including contact personnel, addresses and telephone numbers, must include a complete description of all systems and equipment and the method of operating and maintaining the equipment. These manuals must be submitted to the Architect/Engineer for review and approval at the earliest date possible following substantial completion, but in all cases prior to final acceptance. Included within the manuals shall be a list of names, addresses and telephone numbers of all the Subcontractors involved in the installations and of firms capable of performing services for each mechanical item.

8.2.2 As a pre-condition to the Final acceptance of a facility for beneficial use, the Contractor shall provide a "throw-away" copy of operations and maintenance manuals to allow the Using Agency's staff to operate the equipment prior to receiving the hard bound copies required by this Contract.

8.3 TRAINING

The Contractor shall provide formal instruction for DPMC-designated personnel, addressing the operation and maintenance of the facilities and all installed equipment for each operating system or major item of equipment or as otherwise specified. The operations and maintenance manuals shall be used as training materials. Unless otherwise accepted by the DPMC, training course format shall be split equally between classroom instruction and field exercise. All classroom instruction may be videotaped by the DPMC. Classroom instruction may be supported by professionally made videotapes. If used, a copy of each professional video that was utilized shall be provided to the DPMC at no cost for future training and reference.

8.4 GUARANTEE

8.4.1 The issuance of a final certificate for payment and/or partial or complete occupancy of the premises shall not be deemed an acceptance of Work not completed in accordance with the Contract Documents. The issuance of a final certificate for payment and/or partial or complete occupancy of the premises shall not relieve the Contractor or its surety of liability with respect to any express or implied warranties or responsibility for faulty materials or workmanship.

8.4.2 The Contractor shall guarantee and warrant, in writing, the Work performed and all materials furnished under this Contract against defects in materials and/or workmanship The Contractor shall be responsible for the value or repair of any damage to other Work or to the building premises resulting from the performance of the Contract.

8.4.3 The Contractor is responsible for the above-stated obligations for a period of one (1) year from the date established in 7.2.2 above. All guarantees, including bonds and registrations, required by the Contract Documents shall be in writing and delivered to the DPMC with submission of the invoice for final payment.

8.4.4 The Contractor shall, at its own expense and without cost to the State, promptly after receipt of written notice thereof, make good any defects in materials or workmanship which may develop during stipulated guarantee periods, as well as any damage to other Work caused by such defects or by repairs. Any other defects in materials or workmanship not discovered during the guarantee period shall be repaired and/or replaced at the Contractor's expense, and such shall be completed within a reasonable time after written notice is given to the Contractor.

8.4.5 Pursuant to the Contract Documents, certain permanent equipment, including elevators and HVAC systems, will have to be activated during construction of the Project to support construction operations. Despite any early activation during the construction of the Project, any and all equipment warranties must extend for the time periods required in the Contract Documents, starting at the date set forth in paragraph 7.2.2.

8.4.5 It is expressly acknowledged and agreed that the express and implied warranties and guarantees to which the State is entitled as well as all warranty and guarantee bonds issued by any surety, shall be in addition to and not in lieu of the State's right to seek recourse against the Contractor and the Contractor's surety for defective work.

ARTICLE 9 - PAYMENTS

9.1 INVOICES

9.1.1 Requests for payment under the Contract for materials delivered or services rendered require the proper completion and submittal of specific forms including, but not limited to, the following:

a. DPMC Form 11/AR50-1 - DPMC Invoice;

b. DPMC Form 11-2 - Monthly Estimate for Payment to Contractor;

c. DPMC Form 11-2a - Certification of Prime Contractor;

d. DPMC Form 11-2b – Certification of Subcontractor;

e. Copies of Subcontractor(s) invoices;

d. DPMC Form 11-3 - Prime Contractors Summary of Stored Materials;

e. DPMC Form 11-3A - Agreement and Bill of Sale Certification for Stored Materials;

f. Consent of Surety forms;

g. Certified Payroll Records;

h. Updated project schedule

i. Any other information or documentation required by other provisions of the Contract documents.

9.1.3 The Contractor shall submit the completed request for payment on a monthly basis for all properly completed billable work to the DPMC Project representative and at the address identified at the pre-construction conference.

9.1.4 One (1) original and one (1) copy of the request for payment packets shall be prepared and submitted unless otherwise specified.

9.1.2 No request for payment shall be deemed to be formally submitted and received for payment until all dollar amounts and completion percentages for each line item in the invoice has been determined and agreed upon by the State and the Contractor.

9.1.5 For the purpose of the State's Prompt Payment Act (N.J.S.A. 2A:30A-1 et seq.):

a. A proper invoice will be deemed to have been received by the owner when it is received by the person or entity designated by the State to review and sign the invoice on the State's behalf at the address designated in the pre-construction conference for receipt of invoices. Receipt of an invoice by such person or entity shall commence the running of the 20-day period for formal approval and certification as provided under N.J.S.A. 2A:30A-2(a);

b. The "billing date", as the term is used in N.J.S.A. 2A:30A-2, shall be the earlier of the date upon which an invoice for payment is approved for payment or twenty (20) days after the invoice is received, unless within such 20-day period

the invoice is found to be incomplete or otherwise unacceptable and returned to the contractor, with a written explanation of deficiencies;

c. In the event that an invoice is found to be deficient and returned to the contractor, the "billing date" shall be calculated from the date that a corrected invoice is received.

d. Payment shall be considered to have been made on the date on which a check for such payment is dated;

e. Payment terms (e.g., "net 20") offered by the contractor shall not govern the State's obligation to make payment;

f. The following periods of time will not be included in the calculation of the due date of any contractor invoice:

(1) Any time elapsed between receipt of an improper invoice and its return to the contractor, not to exceed twenty (20) calendar days; or

(2) Any time elapsed between the State's return of an improper invoice to the contractor and the State's receipt of a corrected invoice.

9.1.6 The provisions of this Article 9 shall not govern the State's payment obligations nor shall they supersede or modify any other contractual provision allowing the withholding of monies from the contractor to the extent that the contractor has not performed in accordance with the provisions of the contract. Nor shall this Article 9 govern the State's payment obligations nor supersede or modify any other contractual provision governing contractor claims for additional compensation beyond the base contract price and approved change orders.

9.2 INTEREST

9.2.1 Interest shall be payable on amounts due the contractor if not paid within thirty (30) calendar days after the billing date specified in the above subparagraph 9.1.5(b), as provided under the State's Prompt Payment of Contractors and Subcontractors Act (N.J.S.A. 2A:30A-01, et seq.) Interest on amounts due shall be payable to the contractor for the period beginning on the day after the required payment date and ending on the date on which the check for payment is drawn.

9.2.2 Interest may be paid by separate payment to the contractor, but shall be paid within thirty (30) calendar days of payment of the principal amount of the approved invoice.

9.2.3 Nothing in this Article 9 shall be construed as entitling the Contractor to payment of interest on any sum withheld by the State for any reason permitted under the contract or applicable law, or on any claim for additional compensation, over and above sums due under the base contract or approved change orders.

9.3 SCHEDULE OF VALUES AND FINAL PAYMENT

9.3.1 Unless otherwise directed, the Contractor shall furnish a schedule of amounts for Contract payments (Unit Schedule Breakdown,) of the total Contract price, showing the amount included therein for each principal category of the Work and for each Contractor

and Subcontractor, in such detail as requested, to provide a basis for determining progress payments. The schedule, as approved, shall be used only as a basis for the Contractor's estimates for progress payments, and approval by the DPMC does not constitute acceptance of the allocability and allowability of costs to a specific element of Work. The Contractor is cautioned that no payment requests shall be approved until the Unit Schedule Breakdown has been approved in writing by the DPMC.

9.3.2 The State will make progress payments monthly as the Work proceeds based upon the Unit Schedule Breakdown.

9.3.2 All material and Work paid pursuant to progress payments shall thereupon become the sole property of the State. This provision shall not be construed as relieving the Contractor from the sole responsibility for the protection of all material and Work upon which payments have been made for the restoration of any damaged work, or as waiving the right of the State to require the fulfillment of all of the terms and conditions of the Contract.

9.3.3 Following completion and acceptance of all work, the amount due the Contractor under this Contract shall be paid only upon satisfactory completion, by the Contractor, of all Contract close-out requirements, completion of a State audit on all Contract values and payments, and after the Contractor has furnished the State with a release of claims against the State, arising by virtue of this Contract, other than claims in stated amounts as may be specifically excepted by the Contractor from the release.

9.3.4 If for any reason the Contractor refuses final payment, the Project may be closed out by the State by the processing of a Final Contract Acceptance certification. The lack of such certificate shall not toll the limitations period applicable to Contractor claims against the State.

9.3.5 In addition to other warranties required by provisions of the Contract and specifications, the Contractor warrants that title to all Work, materials and equipment covered by an application for payment will pass to the State free and clear of all liens, claims, security interests or encumbrances, either upon incorporation into the construction or upon receipt of payment to the Contractor, whichever occurs first. This provision shall not be construed as relieving the Contractor from sole responsibility for the care and protection of materials and work upon which payments have been made, or for the restoration of any damaged work, or as a waiver by the State of its rights to require fulfillment of all terms of the Contract.

9.3.6 By recommending approval of any invoice, the Architect/Engineer shall not be deemed to represent that it has made exhaustive or continuous on-Site inspections to check the quality or quantity of the Work, or that it has reviewed the construction means, methods, techniques, sequences or procedures, or that it has made any examination to ascertain how and for what purpose the Contractor has used the moneys previously paid. The payment of an invoice does not constitute an acceptance of the Work. The State reserves the right to further inspect the Work and to withhold retainage and any additional funds required to pay for any corrective action for non-conforming work.

9.3.7 If any corporation licensed to do business in New Jersey shall be or become delinquent in the payment of taxes, assessments or fees due the State, unless under an

active appeal process or any final judgment in the State's favor against the Contractor, the DPMC may, in accordance with N.J.S.A. 54:49-19 or other applicable law withhold moneys due the said corporation for the purpose of assuring the payment to the State of such taxes, assessments, fees or judgment.

9.4 CERTIFICATION OF PAYMENTS TO SUBCONTRACTOR

Pursuant to N.J.S.A. 52:32-40, 41 and N.J.S.A. 2A:44-148; the Contractor shall submit a Certification of Prime Contractors form and a Certification of Subcontractor form for each Subcontractor identified in the Unit Schedule Breakdown, as part of the submission for each invoiced progress payment.

9.5 STORED MATERIALS

9.5.1 Unless specifically allowed in the Contract Documents, all materials and equipment must be delivered and installed or stored on the Site prior to payment for such material or equipment.

9.5.2 The DPMC may at its discretion allow payment for equipment stored off Site provided that the following has occurred:

a. The DPMC has approved the Contractor's written request;

b. The equipment has been properly stored in an approved location;

c. The Contractor has established the Owner’s title to the specific equipment;

d. The Contractor has provided sufficient proof of insurance for the materials, equipment and the storage facility;

e. The Contractor has submitted a release of liens on said stored equipment;

f. The Contractor has submitted a statement agreeing to assume all costs for storage of material and equipment off Site, including, if required by the DPMC, the cost of storing such material and equipment in a bonded warehouse; and

g. The Contractor furnishes the "Prime Contractor's Summary of Stored Materials" and "Agreement and Bill of Sale Certification for Stored Materials," forms respectively.

9.6 ALLOWANCES

9.6.1 The Contractor shall include in its bid all allowances as may be set forth in the Contract Documents. The Contractor shall purchase the "allowed materials" as directed by the DPMC on the basis of the lowest acceptable quote from at least three competitive offers or as a negotiated cost subject to DPMC approval. If the actual cost of the "allowed materials" is more or less than the stipulated allowance, the Contract price may be adjusted accordingly. The adjustment in Contract price shall be made on the basis of the actual purchase cost without additional charges for overhead, profit, bond premium or any other incidental expenses. The cost of installation of the "allowed materials," unless

otherwise specified, is to be included as the responsibility of the Contractor in whose Contract the allowance is included, and the Contractor installing such "allowed materials" shall not be entitled to additional payment for such installation.

9.6.2 Unless otherwise provided in the Contract Documents:

a. These allowances shall cover the Contractor's true costs, including credit for any trade discount, of the materials and equipment required by the allowance, delivered at the Site, including all applicable taxes;

b. The Contractor's costs for unloading and handling, labor, installation costs, overhead, profit and other expenses reasonably required in connection with such allowance items shall be included in the Contract sum and not as part of the allowances.

9.7 RETAINAGE

9.7.1 In making progress payments for Contract work completed, the State will retain ten percent (10%) of the approved invoice amount until final acceptance and completion of all work covered by the Contract.

9.7.2 The Contractor may, after 50% (fifty percent) of the Contract work is in place, and if the Work is proceeding on schedule, apply for a reduction in the amount retained by the State for the duration of the Contract. Such application must be in writing and accompanied by documentation granting formal consent of surety to the reduction in retainage request. If the DPMC determines that the Contractor's performance has been satisfactory and that the reduction is warranted and appropriate, the State may, with the next progress payment, release any portion of the accumulated retainage in excess of five percent (5%) of the Work in place and retain an amount equal to five percent (5%) of the Work in place for the duration of the Contract. If progress of the Work is not maintained in accordance with the approved schedule, the DPMC may elect to re-institute retainage of ten percent (10%) of the Work in place for the duration of the Contract.

9.7.3 Withholding Payment for Non-Delivery of Data:

a. If technical data such as "as-built" drawings, reports, spare parts lists, repair parts lists, or instruction books (including additional and maintenance manuals), or any part thereof, are not delivered within the time specified by this Contract or are deficient upon delivery, the DPMC has the discretion to withhold from each invoice a percentage (in addition to any other retainage required by the Contract) of the Contract price in accordance with the following table:

When total contract price is:	Percentage to be withheld is:
Less than $250,000.	10%
$250,000.01 through $1,000,000	5.0%
Over $1,000,000	2.0%

b. The withholding of any sums pursuant to this article shall not be construed as, or constitute in any manner, a waiver by the State of the Contractor's obligation to furnish the data required under this Contract. In the event the

Contractor fails to furnish these items, the State shall have those rights and remedies provided by law and pursuant to this Contract, in addition to, and not in lieu of, the sums withheld in accordance with this article.

9.8 MISCELLANEOUS

9.8.1 Disputes regarding nonpayment of a Contractor's invoice under this Article 9 may be submitted to non-binding Alternative Dispute Resolution (ADR) upon mutual agreement of the State and the Contractor. In such event, the State and the Contractor shall share equally the fees and expenses of the selected mediator, arbitrator, umpire or other ADR neutral. Provided, however, that nothing herein shall be construed, in whole or in part, as a waiver, release or modification of the provisions of the New Jersey Contractual Act, N.J.S.A. 59:13-1, et seq., which governs claims against the DPMC.

9.8.2 A Contractor not paid sums due under an approved invoice within thirty (30) days of the billing date may suspend performance without penalty for breach of contract, but only after providing the State with seven (7) days written notice of non-payment, and only in the event that the State fails to furnish the Contractor, within that seven-day period, a written statement of the amount withheld and the reasons for the withholding. Nothing herein shall be construed to excuse the Contractor's nonperformance, or to limit the State's rights and remedies relating to such non-performance, with regard to any monies withheld from the Contractor upon the proper notice provided under this Article 9, or with regard to any Contractor claim disputed by the DPMC.

ARTICLE 10 - CHANGES IN THE WORK

10.1 CHANGES IN THE WORK

10.1.1 The DPMC may at any time, issue a written Change Order which shall direct a change in the Work within the general scope of the Contract, including, but not limited to, changes:

a. In the plans and/or specifications;

b. In the method or manner of performance of the Work;

c. In the State-furnished facilities, equipment, materials, services, or site; or directing acceleration in the performance of the Work; and/or

d. In the time for the completion of the Work.

10.1.2 Change Orders

10.1.2.1 The Contractor agrees to prepare and submit, within ten (10) calendar days of encountering any conditions it considers a change, or upon receiving official notice of a proposed change or written direction to proceed with a change, a current DPMC form entitled "Contractor Change Order Request," to the DPMC. The Contractor shall submit an original of the form. Failure to submit a timely form may be grounds for rejection of the request for Change Order, at the DPMC's discretion.

10.1.2.2 All requests for Contract time extensions must be submitted in accordance with the requirements set forth in Articles 6 and 7, accompanied by copies of the current approved progress schedule and copies of a proposed progress schedule detailing the incorporation of the changed work and the effects of such incorporation on progress. Failure to provide all required information shall be grounds for rejection of the request.

10.1.2.3 DPMC will only consider a contract duration extension Change Order request arising from changes in the Work, if that change is proven by the Contractor to have caused a delay in the completion of the Project. When the Contract duration is increased as a result of a change, the resulting change in Contract amount will include the costs of extended performance, computed in accordance with the terms of this Section, and no further consideration of such costs arising from the specific modification will be given.

10.1.2.4 Every Change Order request submitted by the Contractor shall furnish a price breakdown, which shall cover all work involved in the change whether such work was deleted, added or changed and shall be in sufficient detail to permit an analysis of all material, labor, equipment, subcontract, overhead costs and profit. Any amount proposed for subcontracts shall be supported by an equally detailed breakdown. In addition, if the request includes a time extension, a justification (see section 10.1.4.) shall also be furnished. The request, together with the price breakdown and time extension justification, shall be furnished by the date specified by the DPMC.

10.1.2.5 The following rates shall apply in computing overhead (indirect costs) and profit for Change Orders that do not exceed $25,000. The percentages shall be applicable for deleted work as well as additional work. When a change consists of both added and

deleted work, the applicable percentages shall be applied to the net cost or credit. In any event, the percentages shall not exceed the following:

a. Overhead will be the sum of:

(1) fifteen percent (15%) of direct labor costs. NOTE: For the purpose of this article, the term "direct labor" shall include all foremen (identified by name and not included in the Project as the full-time superintendent or full time foreman as required elsewhere in the contract documents), equipment operators and skilled, semi-skilled and common laborers directly assigned to the specified operation. The term "direct labor costs" shall consist of the Contract or actual payroll rate of wage per hour and fringe benefits paid for each and every hour that such employees are actually engaged in the performance of the Work.

(2) fifteen percent (15%) of direct material costs. NOTE: For the purpose of this article, the term "direct material costs" shall consist of the actual costs of the materials including applicable tax and transportation charges.

b. For rented equipment, an hourly rental rate will be used which will be determined based upon the monthly rental rates in the current edition of the Rental Rate Blue Book for Construction Equipment (Rental Book)and dividing it by 176. An allowance will be made for operating costs for each and every hour the equipment is actually operating in accordance with the rates listed in the Rental Book. The Contractor will be allowed only 65% (sixty-five percent) of the rental rate on Contractor-owned equipment.

c. Bond premiums and payroll taxes, if applicable, will be allowed at actual cost. The Contractor shall submit from the surety to DPMC a letter for the bond premiums.

d. The Contractor's profit on Subcontractor's work will be six percent (6%) of the Subcontractor's costs. Subcontractor indirect costs will be computed in the same manner as for the Contractor. The Contractor agrees to incorporate this article in each of its subcontracts. NOTE: When more than one tier of Subcontractor exists, for the purpose of markups, they shall be treated as one Subcontractor.

e. A profit of six percent (6%), where profit is allowable by the terms of the applicable Contract provision, shall be added to the Contractor's total cost. Indirect costs shall not be duplicated in direct costs.

10.1.2.6 For Change Orders in excess of $25,000 the maximum allowable percentages of 15% overhead and 6% profit applies unless negotiated lower based upon the nature, extent and complexity of the Work involved.

10.1.2.7 The DPMC, in order to avoid delays in the progress of work or when in the best interests of the State, has the discretion to direct the Contractor, in writing, to proceed with work claimed by the Contractor to be extra work , and/or to accelerate its work without a prior agreement on entitlement or costs. Such direction shall be in the form of a Letter of Direction. The Contractor may submit a claim for evaluation by

DPMC, for costs or for time on account of such work and/or acceleration on the form entitled "Contractor Change Order Request," completed in sufficient detail and in accordance with this article within ten (10) calendar days after receipt of the Letter of Direction. Nothing in this article shall excuse the Contractor from proceeding with the Work identified in the Letter of Direction and all other Contract Work. Issuance of a Letter of Direction under this article shall not be intended nor construed as an admission or acknowledgment by the State that the Contractor is entitled to additional compensation and/or time on account of such Work and/or acceleration.

10.2 ACCELERATION

The DPMC may order and direct the Contractor to accelerate its Work at any location(s) by increasing its forces, working overtime and/or working on Saturdays, Sundays, and holidays. If acceleration is required by the DPMC, and not due to any delays on the part of the Contractor, the Contractor will be reimbursed for additional costs.

ARTICLE 11 - CLAIMS AND DISPUTES

11.1 CONTRACTOR CLAIMS

11.1.1 Any claims made by a Contractor against the DPMC for damages, extra costs or any other claim made pursuant to the contract are governed by and subject to the New Jersey Contractual Liability Act, N.J.S.A. 59:13-1 et seq., as well as all the provisions in this Contract.

11.1.2 Upon presentation by the Contractor of a request in writing, the DPMC may review any decision or determination of the State or the Architect/Engineer as to any claim, dispute or any other matter in question relating to the execution or progress of the Work or the interpretation of the Contract Documents. Consistent with the intent of this Contract, the DPMC may schedule a conference for the purpose of settling or resolving such claims, disputes or other matters. Where such a conference is conducted, the Contractor and/or the Architect/Engineer shall be afforded the opportunity to be heard on the matter in question. Following review of the Contractor's request, the DPMC and the Contractor may settle or resolve the disputed matter, provided however that any such negotiations, conferences, settlement or resolution shall be subject to all requirements imposed by law, including where applicable, the New Jersey Contractual Liability Act (N.J.S.A. 59:13-1 et seq.). The DPMC's participation in any effort to negotiate, settle or resolve any such claim or dispute with the Contractor shall not operate to toll or extend the time limitations for notice or suit under the New Jersey Contractual Liability Act.

11.2 MUTUAL RIGHTS AND RESPONSIBILITIES OF ALL CONTRACTORS AND THE ARCHITECT/ENGINEER

11.2.1 Any Contractor or the Architect/Engineer which by its own acts, errors or omissions, damages or unnecessarily delays the Work or otherwise causes damage to the State, any other Contractor or the Architect/Engineer, shall be directly responsible to the aggrieved party or parties, for all costs and expenses incurred due to any such delays and/or damages whether by settlement, compromise or arbitration or judgment.

11.2.2 Any Contractor damaged by the actions of another Contractor or Architect/Engineer shall have a direct right to recovery against the party causing such damages, but shall not have a right to recover such damages against the State.

11.2.3 In addition, the party responsible for causing such damages agrees to defend, indemnify and save harmless the State from all such claims and damages. Nothing contained in this paragraph shall be construed to relieve the responsible party from any liability or damage sustained on account of such acts, errors or omissions.

11.2.4 The State shall not be held vicariously liable to any Contractor for any damages or extra costs caused by any acts or omissions by another party including but not limited to actions of the Architect/Engineer as specified in the above paragraph. The Contractor's exclusive remedy shall be against the party directly responsible for causing such damages or extra costs.

ARTICLE 12 - TERMINATION/SUSPENSION

12.1 SUSPENSION OF THE WORK / STOP WORK

12.1.1 If the Contractor fails to correct defective work or persistently fails to carry out the Work in accordance with the Contract Documents, or if the DPMC determines that it is in the best interest of the Project to do so, the DPMC may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated and the DPMC provides written notice to the Contractor that the stopped Work may resume.

12.1.2 The DPMC shall have the right to defer the beginning or to suspend the whole or any part of the Work herein contracted to be done whenever, in the opinion of the DPMC, it may be necessary or expedient for the State to do so.

12.2 TERMINATION FOR CAUSE

12.2.1 If the Contractor persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials so as to avoid or eliminate delays in the orderly progress of the Work in accordance with the approved schedule; or if the Contractor fails to make prompt payment to any Subcontractor or for materials or labor; or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction; or if the Contractor is guilty of a material breach of a provision of the Contract Documents or otherwise fails to carry out the Work in accordance with the Contract Documents, then the DPMC may, without prejudice to any other right or remedy, and after giving the Contractor and its surety three (3) working days written Notice to forthwith address such breach and default with diligence and promptness, terminate the employment of the Contractor by the issuance of a written Notice to that effect to the Contractor and its surety, should the Contractor fail to comply with the demands of the original above mentioned Three Day Notice.

12.2.2 Upon such termination, the DPMC may take possession of the Site and of all the materials, equipment, and tools on the Site and of any materials stored off Site paid for by DPMC, and may finish the Work by whatever method the DPMC may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the Work is finished.

12.2.3 In the event of termination for default, the surety shall either complete the principal's work or finance the completion of the Work. The surety shall not have the right to do nothing. In the event of the surety's breach of its obligations to the State, the surety shall be subject to all available damages under the law, including but not limited to debarment and the penalties imposed by New Jersey's Consumer Fraud Act.

12.2.4 Within seven (7) calendar days following receipt of Notice of Termination by the surety, the surety shall submit in writing its intention to satisfy its bond obligation to the State as obligee, and to explain its plan to complete the Work, tender a completing Contractor or finance the completion of the Work.

12.2.5 If the surety elects to take over the Work and complete same or to tender a completing Contractor, it must furnish notice of its intent to do so in writing over the

signature of an authorized representative and such notice shall be served upon the DPMC within seven (7) calendar days after service upon the surety of the Notice of Termination. This document shall identify the Contractor to perform this work.

12.2.6 If the surety elects to satisfy its bond obligation by financing the completion of the Work, in lieu of taking over same, the surety and State shall enter into an agreement, within thirty (30) days of the termination Notice, setting forth the details of the payments to be made by the surety. All current obligations for labor and materials incurred and outstanding by the defaulting Contractor on this Project shall be paid by the surety without delay, subject to allowance of reasonable time to verify such claims by the surety.

12.2.7 If the surety fails to satisfy its bond obligations within the time frames established above, the DPMC may undertake the completion of the Project in any manner deemed appropriate. In that circumstance, the surety shall not be relieved of any of its payment and performance bond obligations.

12.2.8 If the unpaid balance of the Contract sum exceeds the cost of finishing the Work (including but not limited to liquidated damages for delays and all other remaining damages sustained by the State originating from such breach of Contract), such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor and its surety shall be obligated to pay the difference to the DPMC promptly upon receipt of billing from the State, and this obligation shall survive the termination of the Contract.

12.3 OWNER'S RIGHT TO COMPLETE THE WORK

12.3.1 Alternatively, should the Contractor fail or refuse to correct its breach and default after receiving the required notice as provided under Section 12.2 hereof, the DPMC, in lieu of terminating the Contractor's employment, may provide for the correction and completion of all remaining Work by other means, and deduct all costs associated with such correction and completion from any undisbursed balance of funds (including earned retainage) remaining under the Contract. Such deduction may be documented by issuance of one or more deductive change orders. DPMC's correction or completion of Work under this paragraph shall not operate to waive, release or diminish the liability of the Contractor and its surety to the State for any breach or default by the Contractor.

12.4 TERMINATION FOR CONVENIENCE

12.4.1 The DPMC may, at any time, terminate the Contract in whole or in any part for the DPMC's convenience and without cause when the DPMC in its sole discretion views termination to be in the public interest.

12.4.2 Upon receipt of an order of Termination for Convenience, the Contractor shall not proceed with any item of work which is not specified in the Order of Termination. The Contractor shall complete all items of work specified in the termination order. Such work shall include punch list items and all work necessary to ensure the safety of the public, to properly secure existing work already constructed or partially constructed and to secure the Project Site. This work so ordered shall be performed in accordance with the Contract Documents, and may include items of work not in the original Contract. The Work performed shall be considered substantially complete upon completion and

acceptance of all items of work specified in the Order, except punch list items. After completion of the punch list items and all documents required by the Contract, the Contract shall terminate upon issuance of a Final Certificate and payment. The DPMC reserves the right to declare in default a Contractor who fails to carry out the conditions set forth in an Order of Termination for Convenience.

12.4.3 When the DPMC orders termination of the Contract for Convenience, all completed items of work as of that date will be paid for at the Contract prices.

12.4.3.1Payment for partially completed work will be paid for at agreed prices.

12.4.3.2 Payment for new items, if any, will be made either at agreed prices or in accordance with Article 10.

12.4.3.3Materials obtained by the Contractor for the Work but which have not been incorporated therein may, at the option of the State, be purchased from the Contractor at actual cost delivered to a prescribed location, or otherwise disposed of as mutually agreed.

12.4.4 Within sixty (60) days of the effective termination date, the Contractor shall submit claims for additional costs actually incurred, not covered above or elsewhere in the Contract. Such claims may include reasonable mobilization costs, overhead expenses attributable to the Work performed, Subcontractor costs not otherwise paid for, actual idle labor costs if Work is stopped in advance of the termination date. The DPMC will not compensate the Contractor for costs prohibited under provisions of the Contract and/or anticipated profits on work not performed.

12.4.5 If the DPMC terminates the Contractor for cause as provided under Article 12.2 of the General Conditions, and if a court of law subsequently determines such termination for cause to have been undertaken without lawful justification, then such termination shall be deemed a termination for convenience governed by this Article 12.4. In that event, recovery by the Contractor and/or the Contractor's surety shall be limited to those costs which are recoverable following a termination for convenience under this Article 12.4.

ARTICLE 13 – OTHER REQUIREMENTS

13.1 PREVAILING WAGE

13.1.1 The Contractor shall comply with the New Jersey Prevailing Wage Act Laws of 1963, Chapter 150, (N.J.S.A. 34:11-56.25 et seq.) and all amendments thereto, and this act is hereby made a part of every Contract entered into on behalf of the State of New Jersey through the DPMC, except those Contracts which are not within the contemplation of the Act. Provisions of the Act include the following stipulations and requirements:

a. All workers employed in the performance of every Contract in which the Contract sum is in excess of $2,000 and to which the DPMC is a party shall be paid not less than the prevailing wage rate as designated by the Commissioner, Division of Labor or his or her duly authorized representative.

(1) The Contractor performing public work for the DPMC and which is subject to the provisions of the Prevailing Wage Act, shall post the prevailing wage rates for each craft and classification involved as determined by the Commissioner, Division of Labor. This posting shall include the effective date of any changes thereof, and shall be displayed in prominent and easily accessible places at the Site of the Work or at such place or places as are used by the Contractor/Subcontractor to pay workers' wages.

(2) At the time of the bid due date, the Bidder and any Subcontractors identified by the Bidder must be registered in accordance with "The Public Works Contractor Registration Act" (N.J.S.A. 34:11-56.48 et seq.) All questions regarding registration shall be addressed to:

Contractor Registration Unit
New Jersey Department of Labor
Division of Wage & Hour Compliance
P O Box 389
Trenton NJ 08625-0389
Telephone: 609-292-9464
FAX: 609-633-8591

b. In the event it is found that any worker, employed by any Contractor covered by any Contract in excess of $2,000 for any public work to which the DPMC is a party, has been paid a rate of wages less than the prevailing wage required by such Contract, DPMC may terminate the Contractor's right to proceed with the Work, or such part of the Work as to which there has been failure to pay required wages, and may otherwise execute the Work to completion.

c. In the event that any Subcontractor retained by a Contractor on any Contract in excess of $2,000 for any public work to which the DPMC is a party, has been paid a rate of wages less than the prevailing wage required by such Contract, DPMC may terminate the Contractor's right to proceed with the Work, or such part of the Work as to which there has been failure to pay required wages, and may

otherwise execute the Work to completion or may require that the Contractor immediately substitute a new Subcontractor at the costs set forth in the Contract.

d Nothing contained in the Prevailing Wage Act shall prohibit the payment of more than the prevailing wage rate to any worker employed on a Project.

e. The Contractor shall, as a condition of subcontract with any tier Subcontractor, require compliance with this section as a condition of Subcontract.

f. The State may audit the Contractor's conformance with the Prevailing Wage Act. If the result of such audit determines that the Contractor has not complied with the Prevailing Wage Act then such Contractor shall be responsible for the cost of this audit.

13.2 PATENTS

13.2.1 The Contractor shall hold and save the State and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for or on account of any patented or non-patented design, devise, invention, process, article or appliance manufactured or used in the performance of the Contract, including its use by the State, unless otherwise specifically stipulated in the Contract Documents.

13.2.2 License and/or royalty fees for the use design, devise, invention, process, article or appliance which is authorized by the State must be reasonable, and paid to the holder of the patent or his or her authorized licensee directly by the State and not by or through the Contractor.

13.2.3 If the Contractor uses any design, devise, invention, process, article or appliance covered by letters, patent or copyright, it shall provide for such use by suitable agreement with the State of such patented or copyrighted design, device or material. It is mutually agreed and understood that, without exception, the Contract prices shall include all royalties or costs arising from the use of such design, devise, invention, process, article or appliance in any way involved in the Work.

13.2.4 The Contractor and/or its surety shall indemnify and save harmless the State from any and all claims for infringement by reason of the use of such patented or copyrighted devise, invention, process, article or appliance, or any trademark or copyright in connection with Work performed under this Contract, and shall defend and indemnify the State for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the execution of the Work or after the completion of the Work. This section shall survive the termination of the Contract.

13.3 RIGHT TO AUDIT

13.3.1 The State reserves the right to audit the records of the Contractor in connection with all matters related to its Contract. The Contractor agrees to maintain its records in accordance with "Generally Accepted Accounting Principles," for a period of not less than five (5) years after receipt of final payment. All charges must be supported by appropriate documentation, including, but not limited to canceled checks. All records

shall be made available to the New Jersey Office of the State Comptroller or other State audit agency upon request and at no cost to the State.

13.3.2 The Contractor shall maintain all documentation related to products, transactions or services under this contract for a period of five years from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller or other State audit agency upon request and at no cost to the State.

13.3.2 The Contractor shall develop, maintain and make available to the DPMC on request such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, Change Orders, all original estimates, takeoffs and other bidding documents, all Subcontractor and supplier Contracts and changes, all records showing all costs and liabilities incurred or to be incurred in connection with the Project (including all Subcontractor and supplier costs), all payment records and all records showing all costs incurred in labor and personnel of any kind, records and other data as the State may request concerning work performed or to be performed under this Contract.

13.3.3 The Contractor acknowledges and agrees that no claim for payment which is premised to any degree upon actual costs of the Contractor shall be recognized or payable by the State except and to the extent that such actual costs are substantiated by records required to be maintained under these provisions.

13.3.4 The Contractor acknowledges and agrees that its obligation to establish, maintain and make available records and the State's right to audit as delineated herein shall extend to actual costs incurred by Subcontractors in performing work required under the Contract Documents. The Contractor shall require in each subcontract that the Subcontractor establish, maintain and make available to the State all records as defined and delineated herein, relating to all work performed under the Subcontractor including work performed by a sub-Subcontractor.

13.4 INSURANCE

13.4.1 Insurance To Be Carried By The Contractor:

The Contractor shall obtain and maintain, at its expense and for the duration of the contract, minimum insurance coverage set forth below. By requiring such minimum insurance, the State of New Jersey shall not be deemed or construed to have assessed the risk that may be applicable to the Contractor under this contract. The Contractor shall assess its own risks and if it deems appropriate and/or prudent, maintain higher limits and/or broader coverage. The Contractor is not relieved of any liability or other obligations assumed or pursuant to the Contract by reason of its failure to obtain or maintain insurance in sufficient amounts, duration or types.

a Commercial General Liability:

(1) Commercial General Liability (CGL)-ISO occurrence form CG001 or a substitute form providing a minimum coverage of $2,000,000 per occurrence for bodily injury liability and $2,000,000 per occurrence for property damage liability and shall cover liability arising from:

- Premises/Operations

- Independent Contractors
- Products/Completed Operations
- Personal and Advertising Injury
- Liability assumed under an insured contract (including defense cost assumed)

(2) The State of New Jersey shall be included as an additional insured under the CGL using ISO additional insured endorsement CG 20 10 and CG 20 37 or a substitute providing equivalent coverage, which endorsement shall include coverage for the State of New Jersey arising out of the completed operations of the contractor, and which coverage shall be maintained in effect for the benefit of the State of New Jersey for a period of three (3) years following the completion of the work specified in section 7.3 of this contract. Additional Insured coverage as required in this subparagraph shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded to the State of New Jersey.

(3) The CGL general aggregate shall apply separately to this project using ISO CG 2503 form – designated construction projects(s) General Aggregate Limit.

(4) There shall be no endorsement or modification of the CGL limiting the scope of coverage for liability arising from explosion, collapse or underground property damage.

(5) If not included in the policy form the CGL policy must be endorsed with a separation of insureds (severability of interests) endorsement.

(6) CGL policy must provide or be endorsed (ISO form CG 24 04) to provide for waiver of subrogation.

b Business Automobile Liability:

(1) Contractor and subcontractors shall maintain business auto liability insurance and such insurance shall cover liability arising out of any auto (including owned, hired and non-owned autos).

(2) The limits of liability shall be not less than $1,000,000 per occurrence for both bodily injury and property damage liability.

(3) Business Automobile coverage shall be written on ISO form CA 00 01 or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in the 1990 and later additions of CA 00 01.

(4) If required by law, the business auto policy shall be endorsed to provide pollution liability coverage equivalent to that provided under the ISO pollution liability broadened coverage for covered autos form

CA 99 48 and the Motor Carrier Act endorsement (MCS 90) shall be attached.

(5) Waiver of Subrogation -- Contractor waives all rights against the State of New Jersey for recovery of damages to the extent these damages are covered by the business auto liability insurance obtained by Contractor pursuant to Paragraph 2.0 of this Agreement.

c Workers Compensation: Workers Compensation Insurance applicable to the laws of the State of New Jersey and other State or Federal jurisdiction is required to protect the employees of the Contractor or any Subcontractor who will be engaged in the performance of this Contract. This insurance shall include employers' liability protection with a limit of liability not less than $500,000.

d Umbrella Liability: Contractor must maintain an Umbrella Liability Policy excess of the Commercial General Liability, Automobile Liability and Employer Liability coverage.

(1) The coverages of the umbrella policy must be as broad as the primary policies covered by this policy and include a "drop-down" provision if the primary coverage becomes impaired or exhausted.

13.4.2 Insurance To Be Carried By The State of New Jersey:

a Builders Risk Insurance: Unless otherwise provided in this agreement the State of New Jersey shall provide and maintain, in a company or companies lawfully authorized to do business in the jurisdiction which this project is located, Builders Risk Insurance in the amount of the initial contract amount as well as subsequent modifications for the entire project at the site on a replacement cost basis.

(1) The Builders Risk coverage shall be on an "All Risk of direct physical loss or damage" or equivalent policy form and include theft, earthquake, flood, temporary structures, demolition and increased cost of construction, architects fees and expenses.

Also the insurance must include coverage for Equipment Breakdown Coverage (a.k.a. Boiler & Machinery) which shall cover insured Equipment during installation and testing. The Builders Risk insurance shall include the interest of the State of New Jersey, the general Contractor, subcontractors and sub-tier contractors in the project.

(2) The Builders Risk Policy shall cover all materials equipment and supplies, assemblies and furnishings intended for specific installation in the project while located at the site. The policy will cover portions of the work off site and portions of the work in transit subject to the policy sub-limits for these coverages.

(3) Waivers of Subrogation -- The State of New Jersey and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees and (2) the

Architect/Engineer, Architect/Engineer's Consultants, and any of their subcontractors, Sub-subcontractors, agents and employees for damages caused by fire or other causes of loss to the extent covered by the Builders Risk insurance or any other property insurance applicable to the work.

(4) The Builders Risk policy will provide for a waiver of subrogation against all interested parties covered by the policy but only to the extent the loss is covered by the policy.

(5) The above insurance shall apply only to the work described in this contract, and shall not apply to alterations, repairs, maintenance and installations of systems, equipment and other items of work which do not result in creating additional habitable space. This insurance shall not protect against damage or loss to any of the Contractor's or Subcontractor's tools, equipment, scaffolding, staging towers or forms and Contractor's materials stored on Site which are not part of the construction Project,. It is understood that the Contractor will, at its own expense, carry all insurance which may be required to provide the necessary protection against such loss or damage herein described which shall contain a waiver of any right of subrogation against the State of New Jersey.

(6) Deductible Provisions -- The insurance protection described herein may contain a deductible clause. The State of New Jersey agrees to bear the cost of all deductibles of the Builders Risk Policy.

(7) Loss Reporting and Loss Adjustment – The Contractor will receive a Loss Reporting Form whenever Builders' Risk Insurance is written. This form includes appropriate loss reporting instructions. In the event of loss, the Contractor shall immediately notify the State of New Jersey, DPMC, in writing, and take any other appropriate steps as may be required under the standard builders' risk insurance policy in effect. Upon the occurrence of any loss or damage prior to the acceptance of the building by the State, the Contractor shall, at the State's option, replace and repair the damaged work as originally provided in the drawings and specifications at no additional compensation to that provided in the original Contract.

(8) Status Trustee for Loss Adjustment -- All losses will be adjusted with, and payable to, the State of New Jersey, as trustee for the insured as their interests may appear. The Contractor shall be named jointly with the State in all policies of insurance, all of which shall be open to inspection by the State.

(9) This provision shall not relieve the Contractor from its obligation to complete, according to plans and specifications, the Project covered by the Contract, and the Contractor and its surety shall be obligated to full performance of the Contractor's undertaking.

13.5 ASSIGNMENT OF ANTITRUST CLAIMS

13.5.1 The Contractor recognizes that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the ultimate purchaser. Therefore, and as consideration for executing this Contract, the Contractor, acting herein by and through its duly authorized agent, hereby conveys, sells, assigns, and transfers to the State of New Jersey, for itself and on behalf of its political subdivisions, instrumentalities, and public agencies, all right, title and interest to all claims and causes of action it may now or hereafter acquire under the antitrust laws of the United States or the State of New Jersey, relating to the particular goods or services purchased or acquired by the State of New Jersey or any of its political subdivisions or public agencies pursuant to this Contract.

13.5.2 In connection with this assignment, the following are the express obligations of the Contractor:

a. The Contractor will take no action which will in any way diminish the value of the rights conveyed or assigned hereunder.

b. The Contractor will advise the Attorney General of New Jersey and DPMC:

(1) in advance of its intention to commence any action on its own behalf regarding any such claim or cause(s) of action; and/or

(2) immediately upon becoming aware of the fact that an action has been commenced on its behalf by some other person(s) of the tendency of such action.

c. The Contractor will notify the defendants in any antitrust suit of the fact of the within assignment at the earliest practicable opportunity after the Contractor has initiated an action on its own behalf or becomes aware that such an action has been filed on its behalf by another person. A copy of such Notice will be sent to the Attorney General of New Jersey and the DPMC.

13.5.3 It is understood and agreed that in the event any payment under any such claim or cause of action is made to the Contractor, it shall promptly pay over to the State of New Jersey the allotted share thereof, if any, assigned to the State hereunder.

END, GENERAL CONDITIONS

HAZARDOUS MATERIALS INVESTIGATION REPORT

NEW VISITOR CENTER
AT THE
WASHINGTON CROSSING STATE PARK
TITUSVILLE, MERCER COUNTY, NEW JERSEY

NJDPMC PROJECT NO. P1222-00

Prepared for:

Ikon.5 Architects

ikon.5 architects
864 Mapleton Road, Suite 100
Princeton, New Jersey 08540

Prepared by:

MATRIXNEWORLD
Engineering Progress

Matrix New World Engineering, Land Surveying,
and Landscape Architecture, PC
26 Columbia Turnpike, 2nd Floor
Florham Park, New Jersey 07932

Project Number: P1222-00
Matrix Project Number: 20-932

March 29, 2022

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1.0 EXECUTIVE SUMMARY

Matrix New World Engineering, Land Surveying, and Landscape Architecture, PC (Matrix), under a sub-consultant agreement with ikon.5 architects (ikon) to perform environmental consulting services, has performed a hazardous materials investigation at the existing Washington Crossing State Park Visitor Center, located at 355 Washington Crossing Pennington Road, in Titusville, New Jersey, in advance of the Department of the Treasury - Division of Property Management and Construction (DPMC) New Visitor Center Project (project). Specifically, Matrix conducted an investigation in order to identify, characterize, quantify, and delineate asbestos-containing materials (ACM), lead-based paint (LBP), polychlorinated biphenyls (PCB), and other universal and/or regulated materials which are expected to be engaged during the demolition of the existing Visitor Center.

Matrix's investigation was inclusive of in-scope areas as documented in the Request for Proposal (RFP) for the subject project (Project No. P1222-00 dated June 10, 2020). This document was utilized by the Matrix field team to determine the intended scope of work (SOW) limits of the project and anticipated impacts to existing building materials and mechanical/electrical components. Suspected regulated and/or hazardous materials were identified by the Matrix team, sampled, and submitted for laboratory characterization for the parameters previous listed.

The results of the hazardous materials investigation have identified ACM and other universal/regulated wastes which will require special handling and disposal to facilitate the work of this contract. Additional sampling prior to construction may be required to characterize materials/components which were inaccessible at the time of the investigation or are uncovered during construction. The following sections outline the investigation methodologies, laboratory analysis methods, the specifics of hazardous/regulated materials identified, and anticipated regulatory requirements for their handling/disposal.

The general site location can be found on the Figure 1 *Regional Location Map*. Tabulated inventories of regulated/hazardous materials identified during these efforts have been provided as attachments to this report. Supporting laboratory data and employee/company certifications and accreditations can be found in the Appendices.

2.0 REVIEW OF EXISTING ENVIRONMENTAL DOCUMENTS

Prior to conducting the limited hazardous materials investigation, Matrix requested access to previous documents/information relating to previously identified hazardous materials associated with the subject property. As of the date of this report, Matrix has not received or reviewed such documents.

3.0 ASBESTOS INVESTIGATION SCOPE AND MATERIAL CHARACTERIZATION

The asbestos portion of the limited hazardous materials investigation was conducted by Matrix on February 10, 2022 by Mr. Matthew Sheldon and Mr. Thomas Nettles, both certified United States Environmental Protection Agency (USEPA) Asbestos Hazard Emergency Response Act (AHERA) Accredited Asbestos Building Inspectors. The sampling program was conducted in accordance with the USEPA publication, "Asbestos in Buildings," survey and sampling protocol, and the AHERA asbestos inspection protocol and 40 Code of Federal Regulations (CFR) Part 763. Employee certifications can be found in Appendix C.

As part of the limited investigation, Matrix collected information on the physical condition, approximate quantity, and locations of suspect ACM, and other characteristics of the structure/space which may affect the likelihood of ACM being disturbed during construction activities. Site photographs documenting materials collected and submitted for laboratory analysis are included in Figures and 3.

3.1 ASBESTOS INVESTIGATION METHODOLOGIES AND LIMITATIONS

The investigation process involved of the following steps:

- Inspection of in-scope areas and components for friable and/or non-friable materials and or products which are likely to contain asbestos.
- Delineation of homogeneous areas (HAs) and determination of the locations for the collection of bulk samples for laboratory analysis.
- Collection of information on the physical condition and location of suspect ACM and other characteristics of in-scope areas which may increase the likelihood that ACM may be disturbed and that fibers could be released and distributed during construction.
- Preparation of a tabulated inventory of suspect ACM and bulk samples collected from suspect ACM. The table includes the location, quantity, condition, material friability and analytical results from bulk samples. Samples were collected from HAs to determine the presence/absence of asbestos. Asbestos Survey Forms utilized during the investigation efforts can be found in Appendix A.

Samples were submitted to Metro Analytical Laboratories, Inc. (NVLAP Certification No. 500081-0) for analysis of asbestos content by polarized light microscopy (PLM) (method EPA600/R-93/116). Representative samples of non-friable organically bound (NOB) materials which were found to be negative for asbestos by PLM analysis (method PLM EPA NOB

gravimetric reduction) were further analyzed by transmission electron microscopy (TEM) (method TEM EPA NOB gravimetric reduction). All samples collected were properly bagged and sealed, cataloged, and chain of custody documentation completed. The analytical results for samples collected are summarized on Figures 4 through 6, and a copy of the laboratory data package can be found in Appendix B.

3.2 LIMITED ASBESTOS INVESTIGATION FINDINGS

The findings of the limited asbestos investigation are described in this section. The location, quantity, condition, friability, and potential for damage of suspect ACM identified within the SOW areas expected to be impacted during demolition activities are described on the provided asbestos survey forms (included within Appendix A).

3.2.1 THERMAL SYSTEM INSULATION

Thermal System Insulation (TSI) is defined in 29 CFR 1910.1101 (Occupational Safety and Health Administration [OSHA], Occupational Exposures to Asbestos) as material “applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.” TSI materials are characterized by their form or composition.

Pipe fitting insulation (i.e., pipe joints, elbows, valves, tees, etc.) may contain asbestos and is usually hand molded mud-applied to the fitting and may have a canvas wrapping over the material. The newer non-asbestos pipe fitting insulation is typically fiberglass covered with a polyvinylchloride (PVC) or paper jacket or rubber. The number of samples to be collected from each friable HA is as follows:

- 3 samples from each HA;
- 1 sample from each HA of patched TSI material if less than 6 square feet; and
- No samples of TSI that is determined, by the certified inspector, to be fiberglass, foam glass, rubber, and other non-suspect insulation.

3.2.2 SURFACING MATERIAL

29 CFR 1910.1101 defines surfacing material as "sprayed, troweled-on or otherwise applied to surfaces (such as plaster on ceilings and walls or other materials on surfaces for acoustical, fireproofing, and other purposes).” The number of samples collected of each homogenous area was determined in the field by total square footage of material, as follows:

- 3 samples from HAs up to 1,000 ft^2;

- 5 samples for HAs of 1,000-5,000 ft^2; and
- 7 samples for HAs greater than 5,000 ft^2.

3.2.3 MISCELLANEOUS MATERIAL

40 CFR 763.83 defines miscellaneous material as building material on "structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or thermal system insulation." A minimum of two (2) samples were collected from each miscellaneous HA.

3.3 ANALYTICAL RESULTS

This section discusses the analytical results of bulk samples collected as part of the hazardous materials investigations. Analytical results are summarized on Figures 4 through 6 and the supporting laboratory data package is included as Appendix B.

3.3.1 SAMPLE LOCATIONS/METHODOLOGY

The locations of the bulk samples collected from each HA noted during the limited investigation are depicted on Figure 10. Matrix collected representative bulk samples for the determination of asbestos content by means of PLM analysis for friable materials. NOB samples that were negative for asbestos by PLM analysis were further analyzed by TEM. Samples were collected in general accordance with the procedures outlined in the AHERA regulations, 40 CFR Part 763. In accordance with 40 CFR Part 763, ACM is defined as a material containing greater than one percent asbestos by weight (<1% asbestos/wt.).

3.3.2 SUMMARY OF ASBESTOS-CONTAINING MATERIALS

A total of twenty-four (24) distinct HAs were collected and submitted for analysis; these include the following:

- Gypsum Wall Board and Associated Joint Compound (HA-01);
- Gypsum Ceiling Board and Associated Joint Compound (HA-02);
- 4" Brown Vinyl Cove Base and Associated Mastic (HA-03);
- All Service Jacket (ASJ) to Fiberglass Pipe Insulation (HA-04);
- ASJ to Fiberglass Duct Insulation (HA-05);
- Duct Vibration Cloth (HA-06);
- Tar Along Ceiling Vent (HA-07);
- Brown Carpet Square Glue (HA-08);

- Beige Wallpaper (HA-09);
- 12”x12” Vinyl Floor Tile and Associated Mastic (HA-10);
- 2’x4’ Ceiling Tile (HA-11);
- Brown Carpet Mastic (HA-12);
- Black Floor Mastic (HA-13);
- 4” Grey Vinyl Cove Base and Associated Mastic (HA-14);
- Rough Ceiling Tile (HA-15);
- Exterior Frame Caulk (HA-16);
- Tar Paper Beneath Siding (HA-17);
- Exterior Gypsum Board (HA-18);
- Multi-Layer Roofing Composite (HA-19);
- Gravel Stop Flashing Tar (HA-20);
- Roof Drain Flashing Tar (HA-21);
- Multi-Layer Base Flashing (HA-22);
- Roll-Out Roofing Membrane (HA-23); and
- Flashing Tar (HA-24).

Of the twenty-four (24) materials collected and submitted for laboratory analysis, the following materials were found to be ACM (>1% asbestos by weight):

- 12”x12” Vinyl Floor Tile (HA-10);
- Multi-Layer Base Flashing (HA-22); and
- Flashing Tar (HA-24).

3.3.3 ASSUMED ASBESTOS-CONTAINING MATERIALS

Matrix investigated and documented materials which were observable and accessible within the understood project limits. It is possible that additional suspect ACM may exist in concealed spaces which were not observable or accessible for sample collection at the time of the limited investigation. Therefore, any suspect materials that may be encountered during the anticipated construction activities must be assumed to contain asbestos and treated as ACM, until proper sampling/analysis can be performed.

4.0 LEAD-BASED PAINT INVESTIGATION

An investigation for the presence of LBP within the SOW limits of the subject project was performed in conjunction with the asbestos investigation efforts. The investigation was conducted by Mr. Matthew Sheldon, a New Jersey Department of Health (NJDOH) certified Lead Inspector/Risk Assessor; and was conducted in general accordance with the revised 1997 U.S. Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead Based Paint Hazards in Housing. The investigation consisted of the visual inspection of the various components associated with the subject structure which are anticipated to be impacted during the proposed project, as well as the collection of representative lead concentration measurements utilizing X-ray fluorescent (XRF) instrumentation.

4.1 LEAD-BASED PAINT METHODOLOGIES AND LIMITATIONS

The LBP inspection performed consisted of the following steps:

- A visual walk through of the affected areas was conducted (noting the areas to be potentially tested). XRF testing of representative painted surfaces was completed on the same day.
- Testing locations were randomly selected in order to facilitate proper testing.
- A total of forty-four (44) measurements of painted components were taken by XRF.
- A tabulated inventory of the testing locations was prepared identifying the testing identification number, component and location, condition of painted surface, substrate material and lead concentration reading.

The testing was accomplished in a manner representative of a cross section of various usage areas, components, and substrates in sections of the site that will be impacted by the project. The results of the XRF testing determined the presence or absence of lead in those various painted surfaces of the site. The results of the LBP testing are summarized in Figure 8.

5.0 INVENTORY OF UNIVERSAL AND REGULATED WASTES

The universal and regulated waste portion of the limited hazardous materials assessment at the subject site was performed within the anticipated project limits concurrently with the ACM efforts, and was targeted at the identification and quantification of materials and/or components which will require special/regulatory handling or disposal to facilitate the work of this contract. These materials include (but may not be limited to) fluorescent light bulbs containing mercury (Hg) vapor, PCB containing light fixture ballasts, mercury-containing materials (MCM), ozone depleting materials, lead acid batteries within exit signs, and stored chemicals.

A tabulated inventory of hazardous/regulated materials observed within the SOW limits of the project, their corresponding quantities, and applicable regulatory requirements can be found on Figure 9.

6.0 POLYCHLORINATED BIPHENYL INVESTIGATION

As part of the investigation, Matrix conducted a concurrent sampling program specific to the identification and testing of suspect PCB containing caulking/sealant materials observed to be within the subject structure which will be impacted during demolition activities. PCBs were used in a wide range of industrial and commercial applications from 1929 to 1979 including hydraulic and dielectric fluids, lubricants, and additives to plastics, paints, and pesticides. Most recently, PCBs have been detected in caulking materials that were manufactured during that period. PCB manufacturing, processing, distribution, and disposal are currently regulated by the Toxic Substances Control Act (TSCA) regulation 40 CFR Part 761. TSCA defines non-liquid (bulk) PCB-containing materials as containing PCB concentrations ≥ 50 parts per million (ppm). Note; non-liquid PCB products containing > 500 ppm require additional transport and disposal (incineration) procedures in accordance with TSCA.

Matrix collected three (3) samples from each HA of caulking materials identified during the investigation. The three (3) samples from each HA of caulking materials were composited on-site and submitted to the receiving laboratory. Analysis was performed by EMSL Analytical, Inc., an independent laboratory, and analyzed for PCB content using EPA Method 3540C 8082A. A copy of the PCB analysis laboratory report is included in Appendix C.

The analytical results for the caulking materials are shown in the following table.

Sample No.	Material Description	Lab ID No.	PCB Concentration	Category
PCB-HA-16	Exterior Frame Caulk	012203310-0001	<0.91 mg/Kg	Unregulated

7.0 INVESTIGATION FINDINGS AND RECOMMENDATIONS

This section describes the findings of the limited hazardous materials assessment performed at the subject site and the expected level of hazardous materials management required to facilitate the work of this contract.

7.1 ASBESTOS-CONTAINING MATERIALS FINDINGS

Matrix's limited asbestos investigation identified several materials which are confirmed or assumed to be ACM. The following materials have been identified as ACM:

- 12"x12" Vinyl Floor Tile (HA-10);
- Multi-Layer Base Flashing (HA-22); and
- Flashing Tar (HA-24).

A tabulated inventory of confirmed and assumed ACM, their corresponding estimated quantities, and locations can be found on Figure 7.

All abatement work performed must be in accordance with applicable federal, state, and local regulations. These regulatory stipulations are expected to include (but are not limited to) the OSHA 29 CFR 1926.1101 (Asbestos Standard for the Construction Industry), the New Jersey Administrative Code (N.J.A.C.) 12:120 (Asbestos Licenses and Permits), N.J.A.C. 5:23-8 (Asbestos Hazard Abatement Project), and the Clean Air Act (CAA) National Emissions Standard for Hazardous Air Pollutants (NESHAP) (40 CFR 61.140).

7.2 LEAD-BASED PAINT FINDINGS

A total of forty-four (44) XRF readings were collected during the investigation, none of which yielded results indicative of LBP. In accordance with OSHA, all paint with detectable concentrations (both lead-containing paint [LCP] and LBP) should be managed properly when demolition/construction procedures are expected to disturb these surfaces. During construction/demolition activities, most of these materials can be disposed of as construction debris. Areas that will require torch cutting or significant disturbance during removing or dismantling should have the LCP/LBP previously removed. LCP/LBP debris generated during abatement activities may be considered hazardous waste. All disturbances of LCP/LBP must be conducted in accordance with the OSHA Lead in Construction Standard, 29 CFR 1926.62.

7.3 UNIVERSAL AND REGULATED WASTES FINDINGS

Matrix inventoried hazardous/regulated materials observed within the project limits in an effort to identify potential special disposal requirements to facilitate the demolition work of this project. A tabulated inventory of other hazardous/regulated materials, their locations, estimated quantities, and applicable regulatory requirements can be found on Figure 9.

7.4 POLYCHLORINATED BIPHENLY FINDINGS

The single caulking material collected and submitted for analysis was found to be below the limit of detection (LOD) and is therefore considered “PCB Free.” This material may enter the general waste stream during the demolition of the subject structure. Additional materials/components which were not included in Matrix’s investigation efforts should be sampled and characterized prior to engagement.

8.0 REPORT CERTIFICATIONS

This report, and the supporting data, findings, conclusions, opinions, and recommendations it contains, represents the result of Matrix's efforts for the limited hazardous materials investigatory work for the project specified.

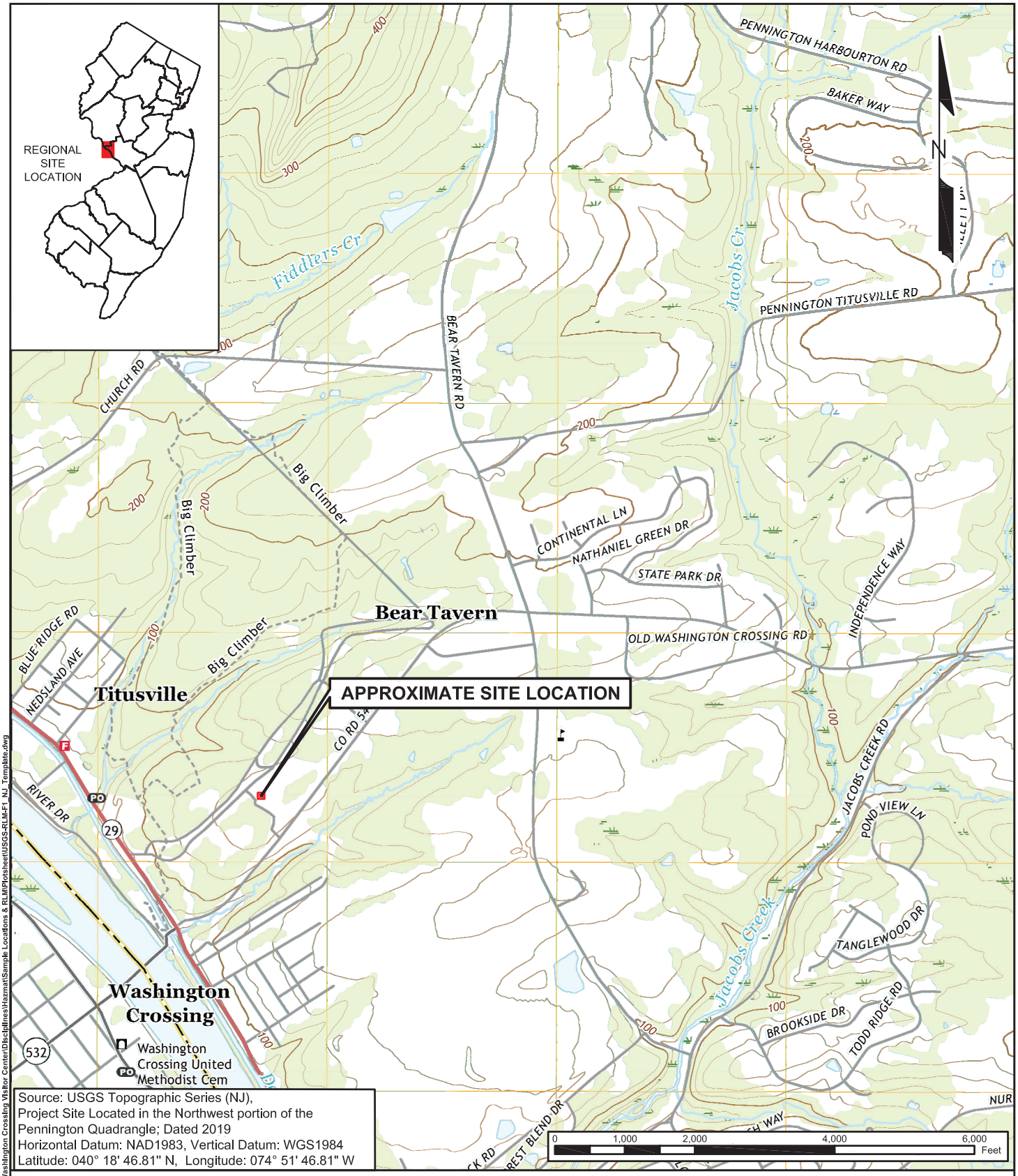
Opinions and recommendations presented in this report apply to site conditions and features as they existed at the time of Matrix's site visit, and those reasonably foreseeable. They cannot necessarily apply to conditions and features of which Matrix is unaware and has not had the opportunity to evaluate.

The conclusions presented in this report are professional opinions based solely upon Matrix's review of the provided RFP documents, visual observations of accessible areas, laboratory test data, and current regulatory requirements. These conclusions are intended exclusively for the purpose stated herein, at the site indicated, and are based upon the scope of work received from ikon for the project indicated.

Report Prepared by:

Michael Bonafede, CHMM
Environmental Scientist

FIGURES



Source: USGS Topographic Series (NJ),
Project Site Located in the Northwest portion of the Pennington Quadrangle; Dated 2019
Horizontal Datum: NAD1983, Vertical Datum: WGS1984
Latitude: 040° 18' 46.81" N, Longitude: 074° 51' 46.81" W

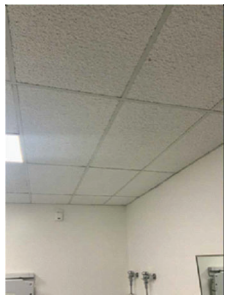
REGIONAL LOCATION MAP

MATRIXNEWORLD
Engineering Progress
Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
26 Columbia Turnpike
Florham Park, New Jersey 07932
WBE / DBE / SBE
Tel: 973-240-1800
Fax: 973-240-1818
www.matrixneworld.com

STATE OF NEW JERSEY DEPARTMENT OF TREASURY
WASHINGTON CROSSING STATE PARK NEW VISITOR CENTER
355 WASHINGTON CROSSING PENNINGTON ROAD
TITUSVILLE, NEW JERSEY

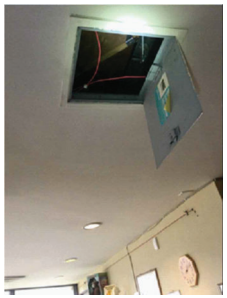
SCALE:	PROJECT NO.:	DATE:	FIGURE NO.:
1 : 24,000	20-932	MARCH 2022	1

PHOTO 1



MATERIAL	GYPSUM WALL BOARD AND JOINT COMPOUND
LOCATION	WOMEN'S ROOM
HA NO.	HA-01

PHOTO 2



MATERIAL	GYPSUM CEILING BOARD AND JOINT COMPOUND
LOCATION	AUDITORIUM
HA NO.	HA-02

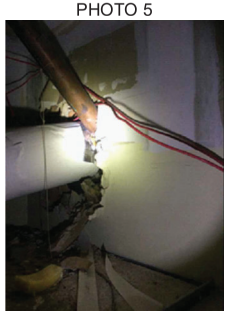
PHOTO 3

MATERIAL	4" BROWN VINYL COVE BASE AND ASSOCIATED MASTIC
LOCATION	MECHANICAL ROOM
HA NO.	HA-03

PHOTO 4

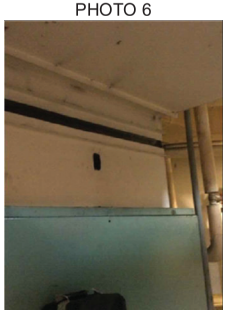
MATERIAL	ASJ TO FIBERGLASS PIPE INSULATION
LOCATION	MECHANICAL ROOM
HA NO.	HA-04

PHOTO 5



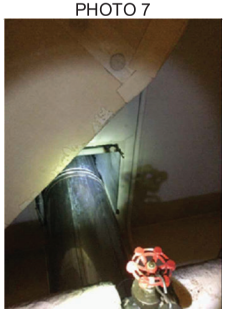
MATERIAL	ASJ TO FIBERGLASS DUCT INSULATION
LOCATION	MECHANICAL ROOM
HA NO.	HA-05

PHOTO 6



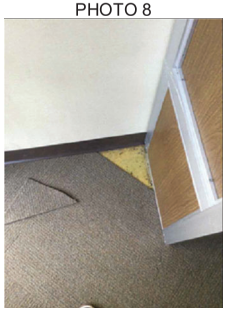
MATERIAL	DUCT VIBRATION CLOTH
LOCATION	MECHANICAL ROOM
HA NO.	HA-06

PHOTO 7



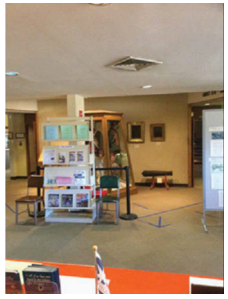
MATERIAL	TAR ALONG CEILING VENT
LOCATION	MECHANICAL ROOM
HA NO.	HA-07

PHOTO 8



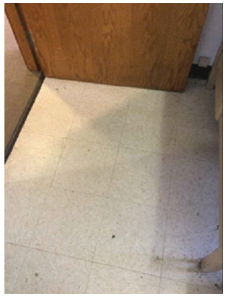
MATERIAL	BROWN CARPET SQUARE GLUE
LOCATION	LOBBY
HA NO.	HA-08

PHOTO 9



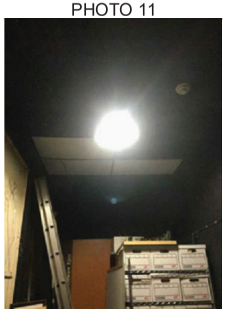
MATERIAL	BEIGE WALLPAPER
LOCATION	LOBBY
HA NO.	HA-09

PHOTO 10



MATERIAL	12"X12" VINYL FLOOR TILE AND ASSOCIATED MASTIC
LOCATION	OFFICE NO. 2 CLOSET
HA NO.	HA-10

PHOTO 11



MATERIAL	2'X4' DROP CEILING TILE
LOCATION	GALLERY
HA NO.	HA-11

PHOTO 12

MATERIAL	BROWN CARPET MASTIC
LOCATION	AUDITORIUM
HA NO.	HA-12

NO.	DESCRIPTION	DATE:	BY:	APR.
	REVISIONS			

DESIGNED BY: TG
CHECKED BY: MB
RELEASED BY: GG

DATE

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Engineering Program
Matrix New World Engineering, Land Surveying
and Landscape Architecture, P.C.
333 West 39th Street Suite 202
New York, New York 10018
Certified WBE
Tel: 973-240-1800
Fax: 973-240-1818
www.mnwe.com
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PHOTOLOG

STATE OF NEW JERSEY DEPARTMENT OF TREASURY
WASHINGTON CROSSING STATE PARK
NEW VISITOR CENTER
355 WASHINGTON CROSSING PENNINGTON ROAD
TITUSVILLE, NEW JERSEY

PROJECT NUMBER: 20-932
SCALE: NTS
DATE: 3/29/2022

FIGURE 2
SHEET 2 OF 10

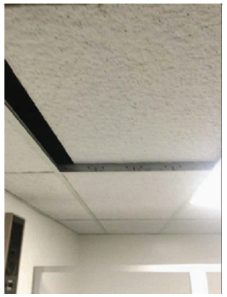
PHOTO 13

MATERIAL	BLACK FLOOR MASTIC
LOCATION	PROJECTOR ROOM
HA NO.	HA-13

PHOTO 14

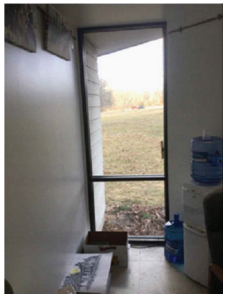
MATERIAL	4" GREY VINYL COVE BASE AND ASSOCIATED MASTIC
LOCATION	MEN'S ROOM
HA NO.	HA-14

PHOTO 15



MATERIAL	ROUGH CEILING TILE
LOCATION	MEN'S ROOM
HA NO.	HA-15

PHOTO 16



MATERIAL	EXTERIOR FRAME CAULK
LOCATION	SOUTH GALLERY WINDOW
HA NO.	HA-16

PHOTO 17

MATERIAL	TAR PAPER BENEATH SIDING
LOCATION	REAR ENCLOSURE
HA NO.	HA-17

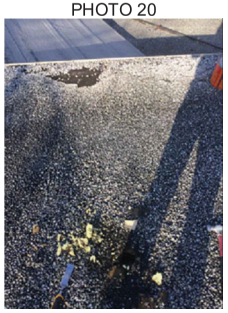
PHOTO 18

MATERIAL	EXTERIOR GYPSUM BOARD
LOCATION	REAR ENCLOSURE
HA NO.	HA-18

PHOTO 19

MATERIAL	MULTI-LAYER ROOFING COMPOSITE
LOCATION	ROOF
HA NO.	HA-19

PHOTO 20

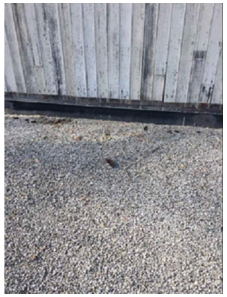


MATERIAL	GRAVEL STOP FLASHING TAR
LOCATION	ROOF
HA NO.	HA-20

PHOTO 21

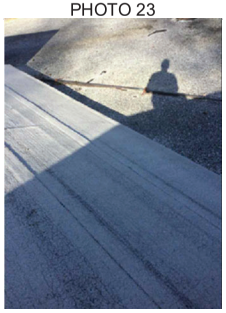
MATERIAL	ROOF DRAIN FLASHING TAR
LOCATION	LOWER ROOF DRAIN
HA NO.	HA-21

PHOTO 22



MATERIAL	MULTI-LAYER BASE FLASHING
LOCATION	LOW/HIGH ROOF JOINT
HA NO.	HA-22

PHOTO 23



MATERIAL	ROLL-OUT ROOFING MEMBRANE
LOCATION	PITCHED ROOF
HA NO.	HA-23

PHOTO 24

MATERIAL	FLASHING TAR
LOCATION	PITCHED ROOF
HA NO.	HA-24

NO.	DESCRIPTION	DATE:	BY:	APR.
	REVISIONS			

DESIGNED BY: TG
CHECKED BY: MB
RELEASED BY: GG

DATE

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Engineering Program
Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
333 West 39th Street Suite 202
New York, New York 10018
Certified WBE
Tel: 973-240-1800
Fax: 973-240-1818
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NEW VISITOR CENTER
355 WASHINGTON CROSSING PENNINGTON ROAD
TITUSVILLE, NEW JERSEY

PROJECT NUMBER: 20-932
SCALE: NTS
DATE: 3/29/2022

FIGURE 3
SHEET 3 OF 10

Homogeneous Area	MATRIX Sample No.	Lab No.	Material Description	Sample Location	PLM Results	PLM NOB Results	TEM NOB Results
01	01-01	B22030087-01	Gypsum Wall Board	Women's Room	ND	NA	NA
	01-02	B22030087-02		Auditorium	ND	NA	NA
	01J-01	B22030087-03	Gypsum Wall Board Joint Compound	Women's Room	ND	NA	NA
	01J-02	B22030087-04		Auditorium	ND	NA	NA
02	02-01	B22030087-05	Gypsum Ceiling Board	Auditorium	ND	NA	NA
	02-02	B22030087-06		Mechanical Room	ND	NA	NA
	02J-01	B22030087-07	Gypsum Ceiling Board Joint Compound	Auditorium	ND	NA	NA
	02J-02	B22030087-08		Mechanical Room	ND	NA	NA
03	03-01	B22030087-09	4" Brown Vinyl Cove Base	Auditorium	NA	ND	ND
	03-02	B22030087-10		Mechanical Room	NA	ND	ND
	03M-01	B22030087-11	4" Brown Vinyl Cove Base Mastic	Auditorium	NA	ND	ND
	03M-02	B22030087-12		Mechanical Room	NA	ND	ND
04	04-01	B22030087-13	All Service Jacket to Fiberglass Pipe Insulation		ND	NA	NA
	04-02	B22030087-14			ND	NA	NA
	04-03	B22030087-15			ND	NA	NA
05	05-01	B22030087-16	All Service Jacket to fiberglass Duct Insulation		ND	NA	NA
	05-02	B22030087-17			ND	NA	NA
	05-03	B22030087-18			ND	NA	NA
06	06-01	B22030087-19	Duct Vibration Cloth		NA	ND	ND
	06-02	B22030087-20			NA	ND	ND
07	07-01	B22030087-21	Tar Along Ceiling Vent		NA	ND	ND
	07-02	B22030087-22			NA	ND	ND
08	08-01	B22030087-23	Brown Carpet Square Glue	Lobby	NA	ND	ND
	08-02	B22030087-24		North Gallery	NA	ND	ND
09	09-01	B22030087-25	Beige Wall Paper	Auditorium	NA	ND	ND
	09-02	B22030087-26		Lobby	NA	ND	ND
10	**10M-01**	**B22030087-27**	**12"x12" Vinyl Floor Tile Mastic**	**Office #2 Closet**	**NA**	**ND**	**ND**

DESIGNED BY: TG
CHECKED BY: MB
RELEASED BY: GG

NO.	DESCRIPTION	DATE:	BY:	APR.
	REVISIONS			

DATE

MATRIX NEW WORLD
Engineering Program
Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
333 West 39th Street Suite 202
New York, New York 10018
Certified WBE
Tel: 973-240-1800
Fax: 973-240-1818
www.mnwe.com
STATE OF NEW YORK CERTIFICATE OF AUTHORIZATION No. 17-082661

SUMMARY OF ASBESTOS LABORATORY ANALYSIS

STATE OF NEW JERSEY DEPARTMENT OF TREASURY
WASHINGTON CROSSING STATE PARK
NEW VISITOR CENTER
355 WASHINGTON CROSSING PENNINGTON ROAD
TITUSVILLE, NEW JERSEY

PROJECT NUMBER: 20-932
SCALE: NTS
DATE: 3/29/2022

FIGURE 4
SHEET 4 OF 10

Homogeneous Area	MATRIX Sample No.	Lab No.	Material Description	Sample Location	PLM Results	PLM NOB Results	TEM NOB Results
10	10M-02	B22030087-28	12"x12" Vinyl Floor Tile Mastic	Office #2 Closet	NA	ND	ND
	10-01	B22030087-29	12"x12" Vinyl Floor Tile		NA	3.3% Chrysotile	NA
	10-02	B22030087-30			NA	Positive Stop	NA
11	11-01	B22030087-31	2'x4' Ceiling Tile	By South Gallery	NA	ND	ND
	11-02	B22030087-32		By North Gallery	NA	ND	ND
12	12-01	B22030087-33	Brown Carpet Mastic	Auditorium	NA	ND	ND
	12-02	B22030087-34			NA	ND	ND
13	13-01	B22030087-35	Black Floor Mastic	Projector Room	NA	ND	ND
	13-02	B22030087-36			NA	ND	ND
14	14-01	B22030087-37	4" Grey Vinyl Cove Base	Women's Room	NA	ND	ND
	14-02	B22030087-38		Men's Room	NA	ND	ND
	14M-01	B22030087-39	4" Grey Vinyl Cove Base Mastic	Women's Room	NA	ND	ND
	14M-02	B22030087-40		Men's Room	NA	ND	ND
15	15-01	B22030087-41	Rough Ceiling Tile	Women's Room	NA	ND	ND
	15-02	B22030087-42		Men's Room	NA	ND	ND
16	16-01	B22030087-43	Exterior Frame Caulk	West Entrance	NA	ND	ND
	16-02	B22030087-44		South Gallery Window	NA	ND	ND
17	17-01	B22030087-45	Tar Paper Beneath Siding	Rear Enclosure	NA	ND	ND
	17-02	B22030087-46			NA	ND	ND
18	18-01	B22030087-47	Exterior Gypsum Board		ND	NA	NA
	18-02	B22030087-48			ND	NA	NA
19	19-01-L1	B22030087-49	Roofing Composite Tar	Lower Roof	NA	ND	ND
	19-02-L1	B22030087-50		High Roof	ND	NA	NA
	19-01-L2	B22030087-51	Roofing Composite Mineral Board	Lower Roof	ND	NA	NA
	19-02-L2	B22030087-52		High Roof	NA	ND	ND
	19-01-L3	B22030087-53	Roofing Composite Roll-Out Roofing	Lower Roof	NA	ND	ND
	19-02-L3	B22030087-54		High Roof	NA	ND	ND

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	REVISIONS			

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Engineering Program
Matrix New World Engineering, Land Surveying and Landscape Architecture, D.P.C.
333 West 39th Street Suite 202
New York, New York 10018
Tel: 973-240-1800
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SUMMARY OF ASBESTOS LABORATORY ANALYSIS

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PROJECT NUMBER: 20-932
SCALE: NTS
DATE: 3/29/2022

FIGURE 5
SHEET 5 OF 10

Homogeneous Area	MATRIX Sample No.	Lab No.	Material Description	Sample Location	PLM Results	PLM NOB Results	TEM NOB Results
20	20-01	B22030087-55	Gravel Stop Flashing Tar	Lower Roof	NA	ND	ND
	20-02	B22030087-56		High Roof	NA	ND	ND
21	21-01	B22030087-57	Roof Drain Flashing Tar	Lower Roof Drain	NA	ND	ND
	21-02	B22030087-58			NA	ND	ND
22	**22-01-L1**	**B22030087-59**	**Flashing Composite Tar**	**Flashing Along Wall Between the Low and High Roof**	**NA**	**6.3% Chrysotile**	**NA**
	22-02-L1	**B22030087-60**			**NA**	**Positive Stop**	**NA**
	22-01-L2	**B22030087-61**	**Flashing Membrane**		**NA**	**ND**	**Trace Chrysotile**
	22-02-L2	**B22030087-62**			**NA**	**ND**	**Trace Chrysotile**
23	23-01	B22030087-63	Roll-Out Foor Membrane	Pitched Roof Between Low and High Roofs	NA	ND	ND
	23-02	B22030087-64			NA	ND	ND
24	**24-01**	**B22030087-65**	**Flashing Tar**	**Top of Pitched Roof Between Low and High Roofs**	**NA**	**3.8% Chrysotile**	**NA**
	24-02	**B22030087-66**			**NA**	**Postive Stop**	**NA**

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333 West 39th Street Suite 202
New York, New York 10018
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DATE: 3/29/2022

FIGURE 6
SHEET 6 OF 10

Homogenous Area	MATRIX Sample No.	Material Description	Location(s)	Friability	Condition	Approximate Quantity	Notes
Materials Tested Positive for ACM by Matrix							
10	10-01	12"x12" Vinyl Floor Tile	Office #2 Closet	Non-Friable	Good	126 SF	
22	22-01-L1	Flashing Composite Tar	Flashing Along Wall Between the Low and High Roof	Non-Friable	Good	90 SF	
24	24-01	Flashing Tar	Top of Pitched Roof Between Low and High Roofs	Non-Friable	Good	90 SF	

NOTES:
LF = Linear Feet
SF = Square Feet
Quantities are estimated and are not to be used for bidding purposes. Field verification is required prior to abatement activities.

NO.	DESCRIPTION	DATE:	BY:	APR:
	REVISIONS			

DESIGNED BY: TG
CHECKED BY: MB
RELEASED BY: GG

DATE

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Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
333 West 39th Street Suite 202
New York, New York 10018
Certified WBE
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Fax: 973-240-1818
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SUMMARY OF POSITIVE ASBESTOS-CONTAINING MATERIALS

STATE OF NEW JERSEY DEPARTMENT OF TREASURY
WASHINGTON CROSSING STATE PARK
NEW VISITOR CENTER
355 WASHINGTON CROSSING PENNINGTON ROAD
TITUSVILLE, NEW JERSEY

PROJECT NUMBER: 20-932
SCALE: NTS
DATE: 3/29/2022

FIGURE 7
SHEET 7 OF 10

XRF Reading No.	Floor	Location	Wall	Component	Location on Component	Substrate	Cond.	Color	Lead (mg/cm^2)
Calibration 1						Paint			0.8
Calibration 2						Paint			0.7
Calibration 3						Paint			0.8
Calibration 4						Wood			0.0
Calibration 5						Wood			0.0
Calibration 6						Wood			0.0
7	1	Mens Room	A	Wall	Center	Gypsum	I	White	0.1
8	1	Mens Room	B	Wall	Center	Gypsum	I	White	0.2
9	1	Mens Room	C	Wall	Center	Gypsum	I	White	0.2
10	1	Mens Room	D	Wall	Center	Gypsum	I	White	0.0
11	1	Mens Room	-	Floor	Center	Concrete	I	Grey	0.2
12	1	Women's Room	A	Wall	Center	Gypsum	I	White	0.1
13	1	Women's Room	B	Wall	Center	Gypsum	I	White	0.2
14	1	Women's Room	C	Wall	Center	Gypsum	I	White	0.1
15	1	Women's Room	D	Wall	Center	Gypsum	I	White	0.1
16	1	Women's Room	-	Floor	Center	Concrete	I	Grey	0.3
17	1	Lobby	-	Ceiling	Center	Gypsum	I	White	0.1
18	1	South Gallery	-	Ceiling	Center	Gypsum	I	White	0.2
19	1	South Gallery	B	Wall	Center	Gypsum	I	Blue	0.0
20	1	North Gallery	-	Ceiling	Center	Gypsum	I	White	0.0
21	1	North Gallery	C	Wall	Center	Gypsum	I	Blue	0.1
22	1	Office 1	C	Wall	Center	Gypsum	I	White	0.1
23	1	Office 2	A	Wall	Center	Gypsum	I	White	0.2
24	1	Office 2	B	Wall	Center	Gypsum	I	White	0.2
25	1	Office 2	C	Wall	Center	Gypsum	I	White	0.3
26	1	Office 2	D	Wall	Center	Gypsum	I	White	0.0
27	1	Office 2	-	Ceiling	Center	Gypsum	I	White	0.1
28	1	Safe Room	A	Wall	Center	Gypsum	I	White	0.1
29	1	Safe Room	B	Wall	Center	Gypsum	I	White	0.2

XRF Reading No.	Floor	Location	Wall	Component	Location on Component	Substrate	Cond.	Color	Lead (mg/cm^2)
30	1	Safe Room	C	Wall	Center	Gypsum	I	White	0.1
31	1	Safe Room	D	Wall	Center	Gypsum	I	White	0.1
32	1	Safe Room	-	Ceiling	Center	Gypsum	I	White	0.0
33	1	Mechanical Room	A	Wall	Center	Gypsum	F	White	0.0
34	1	Mechanical Room	B	Wall	Center	Gypsum	F	White	0.1
35	1	Mechanical Room	C	Wall	Center	Gypsum	F	White	0.1
36	1	Mechanical Room	D	Wall	Center	Gypsum	I	White	0.1
37	1	Mechanical Room	-	Ceiling	Center	Gypsum	I	White	0.1
38	1	Mechanical Room	-	Duct	Center	Gypsum	I	White	0.2
39	1	Mechanical Room	-	Door	Center	Gypsum	F	Brown	0.1
40	1	Mechanical Room	-	Door Frame	Center	Gypsum	F	Brown	0.2
41	Ext	South Façade	C	Door	Center	Metal	P	Brown	0.2
42	Ext	South Façade	C	Door Frame	Center	Metal	P	Brown	0.2
43	Ext	South Façade	C	Wall	Center	Wood	P	White	0.1
44	Ext	South Façade	C	Soffit	Center	Wood	P	White	0.1
45	Ext	West Façade	D	Wall	Center	Wood	P	White	0.1
46	Ext	North Façade	A	Wall	Center	Wood	P	White	0.0
47	Ext	East Façade	A	Wall	Center	Wood	P	White	0.1
48	Ext	East Façade	A	Signage Letter	Center	Wood	P	Black	0.0
49	Ext	East Façade	A	Tank	Center	Metal	P	White	-0.2
50	Ext	East Façade	A	Railing	Center	Metal	P	Yellow	-0.2
Calibration 51						Paint			1.0
Calibration 52						Paint			0.9
Calibration 53						Paint			1.0
Calibration 54						Wood			0.0
Calibration 55						Wood			0.1
Calibration 56						Wood			0.1

NO.	DESCRIPTION	DATE:	BY:	APR:
	REVISIONS			

DESIGNED BY: TG
CHECKED BY: MB
RELEASED BY: GG

DATE

MATRIXNEWORLD
Engineering | Surveying | Program Management
Matrix New World Engineering, Land Surveying and Landscape Architecture, D.P.C.
333 West 39th Street Suite 202
New York, New York 10018
Certified WBE
Tel: 973-240-1800
Fax: 973-240-1818
www.mnwe.com
STATE OF NEW YORK CERTIFICATE OF AUTHORIZATION No. 17-082661

SUMMARY OF X-RAY FLUORESCENT TESTING RESULTS

STATE OF NEW JERSEY DEPARTMENT OF TREASURY
WASHINGTON CROSSING STATE PARK
NEW VISITOR CENTER
355 WASHINGTON CROSSING PENNINGTON ROAD
TITUSVILLE, NEW JERSEY

PROJECT NUMBER: 20-932
SCALE: NTS
DATE: 3/29/2022

FIGURE 8
SHEET 8 OF 10

ITEM NO.	LOCATION	MATERIAL/COMPONENT DESCRIPTION	HAZMAT	MODEL NO.	ESTIMATED QUANTITY	UNITS	CHARACTERIZATION REQUIRED	ANALYSIS METHOD	Applicable Regulation(s)	40 CFR PART 273	40 CFR 761	40 CFR 279	40 CFR 280 Subparts F & G	40 CFR PART 82, SUBPARTS A & F	40 CFR PART 261	40 CFR PART 261.4	40 CFR 262	40 CFR 263	40 CFR 264	40 CFR 268	49 CFR 171	49 CFR 173.185	29 CFR 1910.1200	29 CFR 1926.59	29 CFR 1926.62	10 CFR PART 31.5
										EPA	EPA	EPA	EPA	EPA	EPA	EPA	EPA	EPA	EPA	EPA	DOT	DOT	OSHA	OSHA	OSHA	NRC
1	EXISTING VISITOR CENTER	TRANSFORMER (WET TYPE)	PCB Liquid	-	1	UNIT	Y	SW-8082A		-	O	-	-	-	-	-	-	-	-	-	O	O	-	-	-	-
2		LIGHT FIXTURE BALLASTS	PCB Bulk	-	4	UNITS	N	-		-	O	-	-	-	-	-	-	-	-	-	O	O	-	-	-	-
3		FLUORESCENT LAMPS	Hg Lamp	-	40	UNITS	N	-		O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4		CHEMICAL STORAGE CONTAINER	Used Oil	-	1	UNITS	Y	HAZCAT		-	-	O	-	-	-	-	-	-	-	-	O	O	-	-	-	-
5		THERMOSTAT	Hg- Containing Ampoule	-	4	UNITS	N	-		O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6		EMERGENCY EXIT LIGHTS	Pb Battery	-	5	UNITS	N	-		O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7		FIRE EXTINGUISHER	HHW	-	4	UNITS	N	-		-	-	-	-	-	-	-	-	O	-	-	-	-	-	-	-	-
8		AIR CONDITIONER UNIT	CFC	-	4	UNITS	N	-		-	-	-	-	O	-	-	-	-	-	-	-	-	-	-	-	-

NOTES:

Ea. - Each
Hg - Mercury
HHW - Household Hazardous Waste
PCB - Polychlorinated Biphenyl
CO_2 - Carbon Dioxide
Pb - Lead
CFR - Code of Federal Regulations
RCRA - Resource Conservation and Recovery Act
EPA - Environmental Protection Agency

(1) - Consult local fire department prior to disposal. Fire extinguisher units may enter general waste stream if contents emptied and valve removed.
(2) - If a Safety Data Sheet (SDS) for the specified line item can be provided for characterization (listed waste), no testing will be required.

NO.	DESCRIPTION	DATE:	BY:	APR.
	REVISIONS			

DESIGNED BY: TG
CHECKED BY: MB
RELEASED BY: GG

DATE

MATRIXNEWORLD
Engineering Progress
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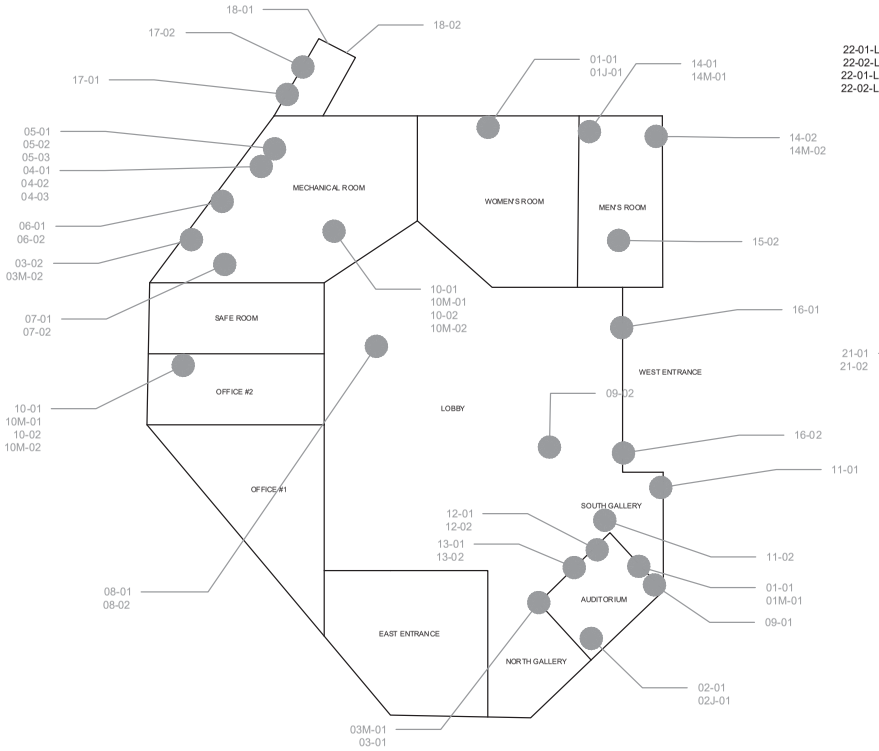
INVENTORY OF UNIVERSAL AND HAZARDOUS MATERIALS

STATE OF NEW JERSEY DEPARTMENT OF TREASURY
WASHINGTON CROSSING STATE PARK
NEW VISITOR CENTER
355 WASHINGTON CROSSING PENNINGTON ROAD
TITUSVILLE, NEW JERSEY

PROJECT NUMBER: 20-932
SCALE: NTS
DATE: 3/29/2022

FIGURE 9
SHEET 9 OF 10



LEGEND

- 00-00 BULK ASBESTOS SAMPLE LOCATION (POSITIVE)
- 00-00 BULK ASBESTOS SAMPLE LOCATION (NEGATIVE)

NO.	DESCRIPTION	DATE:	BY:	APR.
	REVISIONS			

DESIGNED BY: TG
CHECKED BY: MB
RELEASED BY: GG
DATE

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ASBESTOS SAMPLE LOCATION PLAN

STATE OF NEW JERSEY DEPARTMENT OF TREASURY
WASHINGTON CROSSING STATE PARK
NEW VISITOR CENTER
355 WASHINGTON CROSSING PENNINGTON ROAD
TITUSVILLE, NEW JERSEY

PROJECT NUMBER: 20-932
SCALE: NTS
DATE: 3/29/2022

FIGURE 10
SHEET 10 OF 10

APPENDIX A

ASBESTOS SURVEY FORM

Typical Materials to Inspect

DPMC
Location: Washington Crossing State Park Visitor Center
355 Washington Crossing Pennington Road
Titusville, New Jersey
Inspectors: M. Sheldon & T. Nettles

- ☐ Thermal System Insulation
- ☐ Floor Tile / Mastic
- ☐ Other Floor System
- ☐ Ceiling Tile
- ☐ Ceiling Plaster (Multi-Layers)
- ☐ Wall Plaster (Multi-La
- ☐ Wall Board
- ☐ Joint Compound
- ☐ Ext. Caulk
- ☐ Window Caulk
- ☐ Window Putty
- ☐ Transite Panels
- ☐ Gaskets / Brakes
- ☐ Fire Brick & Mortar
- ☐ Elev. Brake Pads
- ☐ Ext. Masonry
- ☐ Roof Materials
- ☐ Roof Flashing
- ☐ Galbestos
- ☐ Other

Date: 2/10/2022

Functional Space Floor/Space	Potential ACM	Approximate Quantity of ACM	Condition	Friable or Non-Friable	Sample Number	Photo ID Number	Notes
mechanical Room	Concrete floor				NS		
	gypsum walls w/ JC	200sf	G	F	01		
	gypsum ceiling w/ JC	1200sf	G	F	02		
	4" Brown Vinyl Cove Base w/ mastic	130LF	G	NF	03		
	wooden Door	1 door	-	-	NS		
	Fiberglass insulated int/ext double Door	2 doors	G	-	NS		
	various metal electrical conduits w/ Rubber wiring				NS		
	Electrical panels	2 units	G	-	NS		Newer. No suspect Insulation or wire
	ASJ to Fiberglass Insulated Pipes		G	NF	04		
	↳ All elbows = PVC	2 bunts	—		NS		
	slop sink				↓		
	Verizon Data Panels	3 units					
	Hot water Heater	1 unit					other Haz
↓	uninsulated metal Ducts				↓		

Condition - Good, Damaged or Significantly Damaged

ASBESTOS SURVEY FORM

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- ☐ Wall Plaster (Multi-La
- ☐ Wall Board
- ☐ Joint Compound
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- ☐ Window Caulk
- ☐ Window Putty
- ☐ Transite Panels
- ☐ Gaskets / Brakes
- ☐ Fire Brick & Mortar
- ☐ Elev. Brake Pads
- ☐ Ext. Masonry
- ☐ Roof Materials
- ☐ Roof Flashing
- ☐ Galbestos
- ☐ Other

Date: 2/10/2022

Functional Space Floor/Space	Potential ACM	Approximate Quantity of ACM	Condition	Friable or Non-Friable	Sample Number	Photo ID Number	Notes
Mechanical Room	Furnace (newer)	1unit		NS			
↓	ASJ to Fiberglass ins. - ducts	100 sf	G	05			
	K Duct vibration cloth	1unit 10 sf	G	06			
	tar along ceiling vent	6+ sf	G	07			
Lobby	Brown carpet square Mastic	480 LF		08			to concrete
↓	gypsum walls	2000 sf		HA-01			
	Beige wall paper	2000 sf		09			
	4" Brown VCB	510 LF		HA-03			
	gypsum ceiling	480 sf	↓	HA-02			
	High hat Lights w/ incandescent Bulbs	—		NS			
↓	wooden counter/ lobby Desk			NS			
	2'x4' ceiling tile	40 sf	G	11			
office 1	HA to Lobby	quantities = 1/3					
	Curtain wall @ North = NS.						

Condition - Good, Damaged or Significantly Damaged

ASBESTOS SURVEY FORM

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- ☐ Wall Plaster (Multi-La
- ☐ Wall Board
- ☐ Joint Compound
- ☐ Ext. Caulk
- ☐ Window Caulk
- ☐ Window Putty
- ☐ Transite Panels
- ☐ Gaskets / Brakes
- ☐ Fire Brick & Mortar
- ☐ Elev. Brake Pads
- ☐ Ext. Masonry
- ☐ Roof Materials
- ☐ Roof Flashing
- ☐ Galbestos
- ☐ Other

Date: 2/10/2022

Functional Space Floor/Space	Potential ACM	Approximate Quantity of ACM	Condition	Friable or Non-Friable	Sample Number	Photo ID Number	Notes
South entrance	Concrete Floor				NS		
	metal/glass curtain walls w/ Doors	2			NS		No caulks
	gypsumwalls	80 sf	G	F	HA-01		
	wall paper	80 sf	G	NF	HA-09		
	gypsum ceiling	50 sf	G	F	HA-02		
North entra..	Concrete Floor				NS		
	metal/glass curtain walls w/ Doors	2			NS		No caulks
	gypsumwalls	80 sf	G	F	HA-01		
	wall paper	80 sf	G	NF	HA-09		
	gypsum ceiling	50 sf	G	F	HA-02		

Condition - Good, Damaged or Significantly Damaged

ASBESTOS SURVEY FORM

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- □ Floor Tile / Mastic
- □ Other Floor System
- □ Ceiling Tile
- □ Ceiling Plaster (Multi-Layers)
- □ Wall Plaster (Multi-La
- □ Wall Board
- □ Joint Compound
- □ Ext. Caulk
- □ Window Caulk
- □ Window Putty
- □ Transite Panels
- □ Gaskets / Brakes
- □ Fire Brick & Mortar
- □ Elev. Brake Pads
- □ Ext. Masonry
- □ Roof Materials
- □ Roof Flashing
- □ Galbestos
- □ Other

Date: 2/10/2022

Functional Space Floor/Space	Potential ACM	Approximate Quantity of ACM	Condition	Friable or Non-Friable	Sample Number	Photo ID Number	Notes
South Gallery	Brown carpet Squares w/ mastic	360 sf	G		HA-08		to concrete
	gypsum walls	550 sf			HA-01		Electric thermustat
	wall paper	↓			HA-04		
	4" Bc VC	150 LF			HA-03		
	window @ North w/ metal Frame + Rubber Lining	1 unit			NS		No caulk
	gypsum Ceiling	60 sf	G		HA-02		Practical ceiling
	Exposed wood decking and Joists				NS		stage lights
North Gallery	Brown carpet Squares w/ mastic	360 sf	G		HA-08		to concrete
	gypsum walls	550 sf			HA-01		Electric thermustat
	wall paper	↓			HA-04		
	4" Brown VCB	150 LF			HA-03		
	window @ North w/ metal Frame + Rubber Lining	1 unit			NS		No caulk
	gypsum Ceiling	60 sf	G		HA-02		Practical ceiling
	Exposed wood decking and Joists				NS		stage lights

Condition - Good, Damaged or Significantly Damaged

ASBESTOS SURVEY FORM

Typical Materials to Inspect

DPMC
Location: Washington Crossing State Park Visitor Center
355 Washington Crossing Pennington Road
Titusville, New Jersey
Inspectors: M. Sheldon & T. Nettles

- □ Thermal System Insulation
- □ Floor Tile / Mastic
- □ Other Floor System
- □ Ceiling Tile
- □ Ceiling Plaster (Multi-Layers)
- □ Wall Plaster (Multi-La
- □ Wall Board
- □ Joint Compound
- □ Ext. Caulk
- □ Window Caulk
- □ Window Putty
- □ Transite Panels
- □ Gaskets / Brakes
- □ Fire Brick & Mortar
- □ Elev. Brake Pads
- □ Ext. Masonry
- □ Roof Materials
- □ Roof Flashing
- □ Galbestos
- □ Other

Date: 2/10/2022

Functional Space Floor/Space	Potential ACM	Approximate Quantity of ACM	Condition	Friable or Non-Friable	Sample Number	Photo ID Number	Notes
office #2	12"x12" white vinyl Floor tile	126 sf	G	NF	10/10m		
	Gypsum Walls	386 sf	G	F	HA-01		
	Wooden Doors	4 units	—		NS		
	metal / Rubber windows Ext	1 unit	—		NS		

Condition - Good, Damaged or Significantly Damaged

ASBESTOS SURVEY FORM

Typical Materials to Inspect

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355 Washington Crossing Pennington Road
Titusville, New Jersey
Inspectors: M. Sheldon & T. Nettles

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- ☐ Floor Tile / Mastic
- ☐ Other Floor System
- ☐ Ceiling Tile
- ☐ Ceiling Plaster (Multi-Layers)
- ☐ Wall Plaster (Multi-La
- ☐ Wall Board
- ☐ Joint Compound
- ☐ Ext. Caulk
- ☐ Window Caulk
- ☐ Window Putty
- ☐ Transite Panels
- ☐ Gaskets / Brakes
- ☐ Fire Brick & Mortar
- ☐ Elev. Brake Pads
- ☐ Ext. Masonry
- ☐ Roof Materials
- ☐ Roof Flashing
- ☐ Galbestos
- ☐ Other

Date: 2/10/2022

Functional Space Floor/Space	Potential ACM	Approximate Quantity of ACM	Condition	Friable or Non-Friable	Sample Number	Photo ID Number	Notes
Exterior facade	Wood siding				NS		
	Tar Paper		G	NF	17		Beneath Siding
	gypsum		D	F	18		No JC
Lower Roof	Flat Roof composite Tar		G	NF	19-L1		
	foam(2x)			F	NS		
	Mineral Board			F	19-L2		
	Roll-out Roofing			NF	19-L3		
	gravel stop flashing tar				20		
	Roof Drain flashing Tar				21		
Low meets high	Flashing composite Flashing tar				22-L1		
	Mineral Board			F	19-L2		
	Flashing Membrane			NF	22-L2		
Pitched Roof	Roll-out Roof membrane				23		
	Flashing Tar				24		

Caulk to side and vents = Silicone = NS

Condition - Good, Damaged or Significantly Damaged

APPENDIX B

METRO ANALYTICAL LABORATORIES
255 West 36th St., Suite #101
New York, NY 10018
p: (212) 695-0165 f: (212) 695-0183

ASBESTOS ANALYSIS of BULK SAMPLE by POLARIZED LIGHT MICROSCOPY and TRANSMISSION ELECTRON MICROSCOPY

Client:	**Matrix New World Engineering**	Contract:	**DPMC**	**Metro Lab ID #:**	**B22030087**
Address:	333 West 39th Street Suite 202	Client Job #:	**20-932**		
	New York NY 10018	Location:	**355 Washington Crossing Pennington Road**		
	P: (973) 240-1800 F:		**Washington Crossing State Park Visitor Center**	Sample Received:	03/03/2022
			Titusville NJ	PLM Analysis Date:	03/03/2022, 03/04/2022
Contact:	**Tyler Gilmore**	Sampled By:	M.S., T.N.	TEM Analysis Date:	03/05/2022
	M: (732) 610-4789	Sampled Date:	02/10/2022	Reported By:	Sharye Bethancourt
	E: tgilmore@mnwe.com	Turnaround Time:	3-5 days	Report Date:	03/07/2022

Summary of Analysis

LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos	Total Asbestos
1	01-01	Brown / Grey Inhomogenous Fibrous WOMEN'S ROOM - GYPSUM WALL BOARD - MISC.	NY ELAP 198.1	25% Cellulose 2% Fiberglass	73% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
2	01-02	Brown / Grey Inhomogenous Fibrous AUDITORIUM - GYPSUM WALL BOARD - MISC.	NY ELAP 198.1	20% Cellulose 2% Fiberglass	78% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
3	01J-01	White Homogenous Granular WOMEN'S ROOM - GYPSUM WALL BOARD JOINT COMPOUND - MISC.	NY ELAP 198.1		100% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
4	01J-02	White Homogenous Granular AUDITORIUM - GYPSUM WALL BOARD JOINT COMPOUND - MISC.	NY ELAP 198.1		100% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
5	02-01	White Homogenous Fine Grained AUDITORIUM - GYPSUM CEILING BOARD - MISC.	NY ELAP 198.1	5% Cellulose	95% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
6	02-02	White Homogenous Fine Grained MECHANICAL ROOM - GYPSUM CEILING BOARD - MISC.	NY ELAP 198.1	8% Cellulose	92% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
7	02J-01	Brown / White Inhomogenous Fine Grained AUDITORIUM - GYPSUM CEILING BOARD JOING COMPOUND - MISC.	NY ELAP 198.1	7% Cellulose	93% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
8	02J-02	White Homogenous Fine Grained MECHANICAL ROOM - GYPSUM CEILING BOARD JOING COMPOUND - MISC.	NY ELAP 198.1	1% Cellulose	99% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
9	03-01	Brown Homogenous NOB AUDITORIUM - 4" BROWN VINYL COVE BASE - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive	None Detected
			NY ELAP 198.4				None Detected
10	03-02	Brown Homogenous NOB MECHANICAL ROOM - 4" BROWN VINYL COVE BASE - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive	None Detected
			NY ELAP 198.4				None Detected

Comments

Equipment: PLM SCOPE Nikon Optiphot-2
TEM SCOPE #2 - Hitachi H-7000

Zlatan Dimitrijevic
Laboratory Director

Medhat Faleh / Reda Abdelmalak
PLM Analyst

Atef Guirguis
TEM Analyst

NYS ELAP ID # 12003

NVLAP Lab Code 500081-0

METRO ANALYTICAL LABORATORIES
255 West 36th St., Suite #101
New York, NY 10018
p: (212) 695-0165 f: (212) 695-0183

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Client:	**Matrix New World Engineering**	Contract:	**DPMC**	**Metro Lab ID #:**	**B22030087**
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	New York NY 10018	Location:	**355 Washington Crossing Pennington Road**		
	P: (973) 240-1800 F:		**Washington Crossing State Park Visitor Center**	Sample Received:	03/03/2022
			Titusville NJ	PLM Analysis Date:	03/03/2022, 03/04/2022
Contact:	**Tyler Gilmore**	Sampled By:	M.S., T.N.	TEM Analysis Date:	03/05/2022
	M: (732) 610-4789	Sampled Date:	02/10/2022	Reported By:	Sharye Bethancourt
	E: tgilmore@mnwe.com	Turnaround Time:	3-5 days	Report Date:	03/07/2022

Summary of Analysis

LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos	Total Asbestos
11	03M-01	Brown Homogenous NOB AUDITORIUM - 4" BROWN VINYL COVE BASE MASTIC - MISC.	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			 Inconclusive None Detected None Detected	
12	03M-02	Brown Homogenous NOB MECHANICAL ROOM - 4" BROWN VINYL COVE BASE MASTIC - MISC.	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			 Inconclusive None Detected None Detected	
13	04-01	Silver / White Inhomogenous Fibrous MECHANICAL ROOM - ALL SERVICE JACKET TO FIBERGLASS PIPE INS. - TSI	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	20% Cellulose	80% Non-Fibrous	None Detected	
14	04-02	Silver / White Inhomogenous Fibrous MECHANICAL ROOM - ALL SERVICE JACKET TO FIBERGLASS PIPE INS. - TSI	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	25% Cellulose	75% Non-Fibrous	None Detected	
15	04-03	Silver / White Inhomogenous Fibrous MECHANICAL ROOM - ALL SERVICE JACKET TO FIBERGLASS PIPE INS. - TSI	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	25% Cellulose	75% Non-Fibrous	None Detected	
16	05-01	Silver / White Inhomogenous Fibrous MECHANICAL ROOM - ALL SERVICE JACKET TO FIBERGLASS DUCT INS. - TSI	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	20% Cellulose	80% Non-Fibrous	None Detected	
17	05-02	Silver / White Inhomogenous Fibrous MECHANICAL ROOM - ALL SERVICE JACKET TO FIBERGLASS DUCT INS. - TSI	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	25% Cellulose 3% Fiberglass	72% Non-Fibrous	None Detected	
18	05-03	Silver / White Inhomogenous Fibrous MECHANICAL ROOM - ALL SERVICE JACKET TO FIBERGLASS DUCT INS. - TSI	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	25% Cellulose 15% Fiberglass	60% Non-Fibrous	None Detected	
19	06-01	Black Homogenous NOB MECHANICAL ROOM - DUCT VIBRATION CLOTH - MISC.	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			 Inconclusive None Detected None Detected	
20	06-02	Black Homogenous NOB MECHANICAL ROOM - DUCT VIBRATION CLOTH - MISC.	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			 Inconclusive None Detected None Detected	

Comments

Equipment: PLM SCOPE Nikon Optiphot-2
TEM SCOPE #2 - Hitachi H-7000

Zlatan Dimitrijevic
Laboratory Director

Medhat Faleh / Reda Abdelmalak
PLM Analyst

Atef Guirguis
TEM Analyst

NYS ELAP ID # 12003

NVLAP Lab Code 500081-0

METRO ANALYTICAL LABORATORIES
255 West 36th St., Suite #101
New York, NY 10018
p: (212) 695-0165 f: (212) 695-0183

ASBESTOS ANALYSIS of BULK SAMPLE by POLARIZED LIGHT MICROSCOPY and TRANSMISSION ELECTRON MICROSCOPY

Client:	**Matrix New World Engineering**	Contract:	**DPMC**	**Metro Lab ID #:**	**B22030087**
Address:	333 West 39th Street Suite 202	Client Job #:	**20-932**		
	New York NY 10018	Location:	**355 Washington Crossing Pennington Road**		
	P: (973) 240-1800 F:		**Washington Crossing State Park Visitor Center**	Sample Received:	03/03/2022
			Titusville NJ	PLM Analysis Date:	03/03/2022, 03/04/2022
Contact:	**Tyler Gilmore**	Sampled By:	M.S., T.N.	TEM Analysis Date:	03/05/2022
	M: (732) 610-4789	Sampled Date:	02/10/2022	Reported By:	Sharye Bethancourt
	E: tgilmore@mnwe.com	Turnaround Time:	3-5 days	Report Date:	03/07/2022

Summary of Analysis

LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos	Total Asbestos
21	07-01	Black Homogenous NOB MECHANICAL ROOM - TAR ALONG CEILING VENT - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
22	07-02	Black Homogenous NOB MECHANICAL ROOM - TAR ALONG CEILING VENT - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
23	08-01	Brown Homogenous NOB LOBBY - BROWN CARPET SQUARE VENT - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
24	08-02	Brown Homogenous NOB NORTH GALLERY - BROWN CARPET SQUARE VENT - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
25	09-01	Beige Homogenous NOB AUDITORIUM - BEIGE WALLPAPER - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
26	09-02	Beige Homogenous NOB LOBBY - BEIGE WALLPAPER - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
27	10M-01	Black Homogenous NOB OFFICE #2 CLOSET - 12"X12" VINYL FLOOR TILE MASTIC - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
28	10M-02	Black Homogenous NOB OFFICE #2 CLOSET - 12"X12" VINYL FLOOR TILE MASTIC - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
29	10-01	Off-White Homogenous NOB OFFICE #2 CLOSET - 12"X12" VINYL FLOOR TILE - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			3.3% Chrysotile	3.3%
			NY ELAP 198.4			Not Analyzed	
30	10-02	Off-White Homogenous NOB OFFICE #2 CLOSET - 12"X12" VINYL FLOOR TILE - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Positive Stop Not Analyzed	
			NY ELAP 198.4			Not Analyzed	

Comments

Equipment: PLM SCOPE Nikon Optiphot-2
TEM SCOPE #2 - Hitachi H-7000

Zlatan Dimitrijevic
Laboratory Director

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NYS ELAP ID # 12003

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	New York NY 10018	Location:	**355 Washington Crossing Pennington Road**		
	P: (973) 240-1800 F:		**Washington Crossing State Park Visitor Center**	Sample Received:	03/03/2022
			Titusville NJ	PLM Analysis Date:	03/03/2022, 03/04/2022
Contact:	**Tyler Gilmore**	Sampled By:	M.S., T.N.	TEM Analysis Date:	03/05/2022
	M: (732) 610-4789	Sampled Date:	02/10/2022	Reported By:	Sharye Bethancourt
	E: tgilmore@mnwe.com	Turnaround Time:	3-5 days	Report Date:	03/07/2022

Summary of Analysis

LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos		Total Asbestos
31	11-01	Grey Homogenous NOB BY SOUTH GALLERY - 2'X4' CEILING TILE - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
32	11-02	Grey Homogenous NOB BY SOUTH GALLERY - 2'X4' CEILING TILE - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
33	12-01	Brown Homogenous NOB AUDITORIUM - BROWN CARPET MASTIC - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
34	12-02	Brown Homogenous NOB AUDITORIUM - BROWN CARPET MASTIC - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
35	13-01	Black Homogenous NOB PROJECTOR ROOM - BLACK FLOOR MASTIC	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
36	13-02	Black Homogenous NOB PROJECTOR ROOM - BLACK FLOOR MASTIC	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
37	14-01	Grey Homogenous NOB WOMEN'S ROOM - 4" GREY VINYL COVE BASE - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
38	14-02	Grey Homogenous NOB MEN'S ROOM - 4" GREY VINYL COVE BASE - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
39	14M-01	Multi Homogenous NOB WOMEN'S ROOM - 4" GREY VINYL COVE BASE MASTIC - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
40	14M-02	Multi Homogenous NOB MEN'S ROOM - 4" GREY VINYL COVE BASE MASTIC - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	

Comments

Equipment: PLM SCOPE Nikon Optiphot-2
TEM SCOPE #2 - Hitachi H-7000

Zlatan Dimitrijevic
Laboratory Director

Medhat Faleh / Reda Abdelmalak
PLM Analyst

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ASBESTOS ANALYSIS of BULK SAMPLE by POLARIZED LIGHT MICROSCOPY and TRANSMISSION ELECTRON MICROSCOPY

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	New York NY 10018	Location:	**355 Washington Crossing Pennington Road**		
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			Titusville NJ	PLM Analysis Date:	03/03/2022, 03/04/2022
Contact:	**Tyler Gilmore**	Sampled By:	M.S., T.N.	TEM Analysis Date:	03/05/2022
	M: (732) 610-4789	Sampled Date:	02/10/2022	Reported By:	Sharye Bethancourt
	E: tgilmore@mnwe.com	Turnaround Time:	3-5 days	Report Date:	03/07/2022

Summary of Analysis

LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos		Total Asbestos
41	15-01	Grey Homogenous NOB WOMEN'S ROOM - ROUGH CEILING TILE - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
42	15-02	Grey Homogenous NOB MEN'S ROOM - ROUGH CEILING TILE - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
43	16-01	Black Homogenous NOB WEST ENTRANCE - EXTERIOR FRAME CAULK - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
44	16-02	Black Homogenous NOB SOUTH GALLERY WINDOW - EXTERIOR FRAME CAULK - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
45	17-01	Black Homogenous NOB REAR ENCLOSURE - TAR PAPER BENEATH SIDING - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
46	17-02	Black Homogenous NOB REAR ENCLOSURE - TAR PAPER BENEATH SIDING - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
47	18-01	Brown / Grey Inhomogenous Fibrous REAR ENCLOSURE - EXTERIOR GYPSUM BOARD - MISC.	NY ELAP 198.1	30% Cellulose	70% Non-Fibrous		None Detected	
			NY ELAP 198.6					
			NY ELAP 198.4					
48	18-02	Brown / Grey Inhomogenous Fibrous REAR ENCLOSURE - EXTERIOR GYPSUM BOARD - MISC.	NY ELAP 198.1	15% Cellulose	85% Non-Fibrous		None Detected	
			NY ELAP 198.6					
			NY ELAP 198.4					
49	19-01-L1	Black Homogenous NOB LOWER ROOF - ROOFING COMPOSITE TAR - MISC.	NY ELAP 198.1					
			NY ELAP 198.6			Inconclusive	None Detected	
			NY ELAP 198.4				None Detected	
50	19-02-L1	Brown Homogenous Fibrous HIGH ROOF - ROOFING COMPOSITE TAR - MISC.	NY ELAP 198.1	40% Cellulose	60% Non-Fibrous		None Detected	
			NY ELAP 198.6					
			NY ELAP 198.4					

Equipment: PLM SCOPE Nikon Optiphot-2
TEM SCOPE #2 - Hitachi H-7000

Zlatan Dimitrijevic
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			Titusville NJ	PLM Analysis Date:	03/03/2022, 03/04/2022
Contact:	**Tyler Gilmore**	Sampled By:	M.S., T.N.	TEM Analysis Date:	03/05/2022
	M: (732) 610-4789	Sampled Date:	02/10/2022	Reported By:	Sharye Bethancourt
	E: tgilmore@mnwe.com	Turnaround Time:	3-5 days	Report Date:	03/07/2022

Summary of Analysis

LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos	Total Asbestos
51	19-01-L2	Brown Homogenous Fibrous LOWER ROOF - ROOFING COMPOSITE MINERAL BOARD - MISC.	NY ELAP 198.1	45% Cellulose	55% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
52	19-02-L2	Black Homogenous NOB HIGH ROOF - ROOFING COMPOSITE MINERAL BOARD - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
53	19-01-L3	Black Homogenous NOB LOWER ROOF - ROOFING COMPOSITE ROLL-OUT ROOFING - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
54	19-02-L3	Black Homogenous NOB HIGH ROOF - ROOFING COMPOSITE ROLL-OUT ROOFING - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
55	20-01	Black Homogenous NOB LOWER ROOF - GRAVEL STOP FLASHING TAR - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
56	20-02	Black Homogenous NOB HIGH ROOF - GRAVEL STOP FLASHING TAR - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
57	21-01	Black Homogenous NOB LOWER ROOF DRAIN - ROOF DRAIN FLASHING TAR - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
58	21-02	Black Homogenous NOB LOWER ROOF DRAIN - ROOF DRAIN FLASHING TAR - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
59	22-01-L1	Black Homogenous NOB FLSH. ALONG WALL BTWN. THE LOW & HIGH RF. - FLSH. COMPOSITE TAR - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			6.3% Chrysotile	6.3%
			NY ELAP 198.4			Not Analyzed	
60	22-02-L1	Black Homogenous NOB FLSH. ALONG WALL BTWN. THE LOW & HIGH RF. - FLSH. COMPOSITE TAR - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Positive Stop Not Analyzed	
			NY ELAP 198.4			Not Analyzed	

Comments

Equipment: PLM SCOPE Nikon Optiphot-2
TEM SCOPE #2 - Hitachi H-7000

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	M: (732) 610-4789	Sampled Date:	02/10/2022	Reported By:	Sharye Bethancourt
	E: tgilmore@mnwe.com	Turnaround Time:	3-5 days	Report Date:	03/07/2022

Summary of Analysis

LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos	Total Asbestos
61	22-01-L2	Black Homogenous NOB FLSH. ALONG WALL BETWEEN THE LOW & HIGH RF. - FLSH. MEMBRANE - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			Chrysotile - Trace	
62	22-02-L2	Black Homogenous NOB FLSH. ALONG WALL BETWEEN THE LOW & HIGH RF. - FLSH. MEMBRANE - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			Chrysotile - Trace	
63	23-01	Black Homogenous NOB PITCHED RF. BETWEEN LOW & HIGH RFS. - ROLL-OUT FLOOR MEMBRANE - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			None Detected	
64	23-02	Black Homogenous NOB PITCHED RF. BETWEEN LOW & HIGH RFS. - ROLL-OUT FLOOR MEMBRANE - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Inconclusive None Detected	
			NY ELAP 198.4			Chrysotile - Trace	
65	24-01	Black Homogenous NOB TOP OF PITCHED ROOF BETWEEN LOW & HIGH ROOFS - FLASHING TAR - MISC.	NY ELAP 198.1				3.8%
			NY ELAP 198.6			3.8% Chrysotile	
			NY ELAP 198.4			Not Analyzed	
66	24-02	Black Homogenous NOB TOP OF PITCHED ROOF BETWEEN LOW & HIGH ROOFS - FLASHING TAR - MISC.	NY ELAP 198.1				
			NY ELAP 198.6			Positive Stop Not Analyzed	
			NY ELAP 198.4			Not Analyzed	

Comments

Equipment: PLM SCOPE Nikon Optiphot-2
TEM SCOPE #2 - Hitachi H-7000

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Report Notes

General Notes and Disclaimers

- The samples analyzed in this report were not collected by this laboratory - they were received from the client, or an agent of the client, in good condition, unless otherwise noted.
- All results are calculated based on client-provided samples and / or measurements and fall within the acceptable Quality Control limits, unless otherwise noted.
- The report shall not be reproduced, except in full, without the written approval of the laboratory.
- This report relates only to the samples tested. It may not be used by the client to claim project endorsement by NVLAP, NYS ELAP, or any other government agency.
- All samples will be properly disposed of after 60 days.
- Quality Control data (including 95% confidence limits, laboratory / analysis accuracy and precision) is available upon request.

Notes Regarding Asbestos Testing

- Air Sample Analysis by Phase Contrast Microscopy (PCM) adheres to Method NIOSH-7400. Results < 7 fibers / mm^2 are statistically insignificant.
- Percentages are calculated using the EPA equivalent Stratified Point-Count Method.
- Bulk Sample Analysis by Polarized Light Microscopy (PLM) Friable adheres to EPA/600/M4-082-20 or NYS ELAP 198.1.
- Bulk Sample Analysis by Polarized Light Microscopy (PLM) NOB adheres to NYS ELAP 198.6. This method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing greater than 10% vermiculite.
- All inhomogeneous layers of the bulk samples were analyzed separately.
- Analytical results are sometimes based on the residue percentage(s) provided by the client along with the filters. Trace denotes asbestos detected at < 1%. Smiliarly, samples below quantitation limit (RL) are reported with a less than sign (<).
- Polarized Light Microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative TEM is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.
- Bulk Sample Analysis by Transmission Electron Microscopy (TEM) NOB adheres to NYS ELAP Method 198.4.
- Air Sample Analysis by Transmission Electron Microscopy (TEM) adheres to Method EPA CFR Part 763 Final Rule (AHERA).
- Air Sample Analysis by Transmission Electron Microscopy (TEM) Worksheets are available upon request.

MATRIXNEWORLD
Engineering Progress

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

B22030087

Matrix New World Engineering, Land Surveying and Landscape Architecture, PC
26 Columbia Turnpike
Florham Park, New Jersey 07932

PROJECT INFORMATION

Client: DPMC Project Name: Washington Crossing State Park Visitor Center Location: 355 Washington Crossing Pennington Road, Titusville, NJ Date: 02/10/2022 Email Results to: Hazmat.Labs@matrixneworld.com	Matrix Project No. 20-932 Requested Analysis ☐ ~~NYS ELAP 198.1~~ ☑ EPA/600/R-93 ☐ ~~NYS ELAP 198.2~~ ☑ PLM EPA NOB-EPA/600/R-93 ☐ ~~NYS ELAP 198.6~~ ☑ TEM EPA NOB - EPA 600/R-93 ☐ ~~NYS ELAP 198.8~~ ☐ Other (specify)	Project Manager: Matt Sheldon Investigator(s): Matt Sheldon & Thomas Nettles Turn Around Time ☐ STAT ☐ 48 Hour ☐ 5 Day ☐ Other (specify) ☐ 12 Hour ☐ 72 Hour ☑ 1 Week

BULK SAMPLE INFORMATION

HA No.	Floor	Bulk Sample ID No.	Homogeneous Material	Material Type	Sample Location	Quantity (SF/LF/Units)	Asbestos Content	Analysis		
								PLM	PLM-NOB	TEM
01	1	01-01	Gypsum Wall Board	Misc.	Women's Room			x		
	1	01-02	Gypsum Wall Board	Misc.	Auditorium			x		
	1	01J-01	Gypsum Wall Board Joint Compound	Misc.	Women's Room			x		
	1	01J-02	Gypsum Wall Board Joint Compound	Misc.	Auditorium			x		
02	1	02-01	Gypsum Ceiling Board	Misc.	Auditorium			x		
	1	02-02	Gypsum Ceiling Board	Misc.	Mechanical Room			x		
	1	02J-01	Gypsum Ceiling Board Joint Compound	Misc.	Auditorium			x		
	1	02J-02	Gypsum Ceiling Board Joint Compound	Misc.	Mechanical Room			x		
03	1	03-01	4" Brown Vinyl Cove Base	Misc.	Auditorium				x	x
	1	03-02	4" Brown Vinyl Cove Base	Misc.	Mechanical Room				x	x
	1	03M-01	4" Brown Vinyl Cove Base Mastic	Misc.	Auditorium				x	x
	1	03M-02	4" Brown Vinyl Cove Base Mastic	Misc.	Mechanical Room				x	x
04	1	04-01	All Service Jacket to Fiberglass Pipe Insulation	TSI	Mechanical Room			x		
	1	04-02	All Service Jacket to Fiberglass Pipe Insulation	TSI	Mechanical Room			x		

CHAIN OF CUSTODY

Relinquished By:		Date / Time:
I. Matt Sheldon	(Signature)	2/10/22
Matt Sheldon	(Print)	
II.	(Signature)	
	(Print)	

Received By:		Date / Time:
I.	(Signature)	3/3/22
Marian	(Print)	10:10Am
II.	(Signature)	
	(Print)	

Additional Notes:
* Stop at first positive for each homogeneous material as specified.
*Analyze by Layer. If PLM-NOB is Negative, Re-Analyze by TEM.
*Contact Project Manager Before Performing Method 198.8 unless otherwise specified.

MATRIXNEWORLD
Engineering Progress

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

Matrix New World Engineering, Land Surveying and Landscape Architecture, PC
26 Columbia Turnpike
Florham Park, New Jersey 07932

B 22030087

PROJECT INFORMATION

Client: DPMC Project Name: Washington Crossing State Park Visitor Center Location: 355 Washington Crossing Pennington Road, Titusville, NJ Date: 02/10/2022 Email Results to: Hazmat.Labs@matrixneworld.com	Matrix Project No. 20-932 Requested Analysis ☐ ~~NYS ELAP 198.1~~ ☑ EPA/600/R-93 ☐ ~~NYS ELAP 198.2~~ ☑ PLM EPA NOB-EPA/600/R-93 ☐ ~~NYS ELAP 198.6~~ ☑ TEM EPA NOB - EPA 600/R-93 ☐ ~~NYS ELAP 198.8~~ ☐ Other (specify)	Project Manager: Matt Sheldon Investigator(s): Matt Sheldon & Thomas Nettles Turn Around Time ☐ STAT ☐ 48 Hour ☐ 5 Day ☐ Other (specify) ☐ 12 Hour ☐ 72 Hour ☑ 1 Week

BULK SAMPLE INFORMATION

HA No.	Floor	Bulk Sample ID No.	Homogeneous Material	Material Type	Sample Location	Quantity (SF/LF/Units)	Asbestos Content	Analysis		
								PLM	PLM-NOB	TEM
04	1	04-03	All Service Jacket to Fiberglass Pipe Insulation	TSI	Mechanical Room			x		
05	1	05-01	All Service Jacket to fiberglass Duct Insulation	TSI	Mechanical Room			x		
	1	05-02	All Service Jacket to fiberglass Duct Insulation	TSI	Mechanical Room			x		
	1	05-03	All Service Jacket to fiberglass Duct Insulation	TSI	Mechanical Room			x		
06	1	06-01	Duct Vibration Cloth	Misc.	Mechanical Room				x	x
	1	06-02	Duct Vibration Cloth	Misc.	Mechanical Room				x	x
07	1	07-01	Tar Along Ceiling Vent	Misc.	Mechanical Room				x	x
	1	07-02	Tar Along Ceiling Vent	Misc.	Mechanical Room				x	x
08	1	08-01	Brown Carpet Square Vent	Misc.	Lobby				x	x
	1	08-02	Brown Carpet Square Vent	Misc.	North Gallery				x	x
09	1	09-01	Beige Wall Paper	Misc.	Auditorium				x	x
	1	09-02	Beige Wall Paper	Misc.	Lobby				x	x
10	1	10M-01	12"x12" Vinyl Floor Tile Mastic	Misc.	Office #2 Closet				x	x
	1	10M-02	12"x12" Vinyl Floor Tile Mastic	Misc.	Office #2 Closet				x	x

CHAIN OF CUSTODY

Relinquished By:		Date / Time:
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Matt Sheldon	(Print)	
II.	(Signature)	
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Received By:		Date / Time:
I.	(Signature)	3/3/22
Marian	(Print)	10:10 Am
II.	(Signature)	
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Engineering Progress

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

Matrix New World Engineering, Land Surveying and Landscape Architecture, PC
26 Columbia Turnpike
Florham Park, New Jersey 07932

PO 2203U087

PROJECT INFORMATION

Client: DPMC Project Name: Washington Crossing State Park Visitor Center Location: 355 Washington Crossing Pennington Road, Titusville, NJ Date: 02/10/2022 Email Results to: Hazmat.Labs@matrixneworld.com	Matrix Project No. 20-932 Requested Analysis ☐ ~~NYS ELAP 198.1~~ ☑ EPA/600/R-93 ☐ ~~NYS ELAP 198.2~~ ☑ PLM EPA NOB-EPA/600/R-93 ☐ ~~NYS ELAP 198.6~~ ☑ TEM EPA NOB - EPA 600/R-93 ☐ ~~NYS ELAP 198.8~~ ☐ Other (specify)	Project Manager: Matt Sheldon Investigator(s): Matt Sheldon & Thomas Nettles Turn Around Time ☐ STAT ☐ 48 Hour ☐ 5 Day ☐ Other (specify) ☐ 12 Hour ☐ 72 Hour ☑ 1 Week

BULK SAMPLE INFORMATION

HA No.	Floor	Bulk Sample ID No.	Homogeneous Material	Material Type	Sample Location	Quantity (SF/LF/Units)	Asbestos Content	Analysis		
								PLM	PLM-NOB	TEM
10	1	10-01	12"x12" Vinyl Floor Tile	Misc.	Office #2 Closet				x	x
	1	10-02	12"x12" Vinyl Floor Tile	Misc.	Office #2 Closet				x	x
11	1	11-01	2'x4' Ceiling Tile	Misc.	By South Gallery			x		
	1	11-02	2'x4' Ceiling Tile	Misc.	By North Gallery			x		
12	1	12-01	Brown Carpet Mastic	Misc.	Auditorium				x	x
	1	12-02	Brown Carpet Mastic	Misc.	Auditorium				x	x
13	1	13-01	Black Floor Mastic	Misc.	Projector Room				x	x
	1	13-02	Black Floor Mastic	Misc.	Projector Room				x	x
14	1	14-01	4" Grey Vinyl Cove Base	Misc.	Women's Room				x	x
	1	14-02	4" Grey Vinyl Cove Base	Misc.	Men's Room				x	x
	1	14M-01	4" Grey Vinyl Cove Base Mastic	Misc.	Women's Room				x	x
	1	14M-02	4" Grey Vinyl Cove Base Mastic	Misc.	Men's Room				x	x
15	1	15-01	Rough Ceiling Tile	Misc.	Women's Room			x		
	1	15-02	Rough Ceiling Tile	Misc.	Men's Room			x		

CHAIN OF CUSTODY

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I. Matt Sheldon	(Signature)	2/20/22
Matt Sheldon	(Print)	
II.	(Signature)	
	(Print)	

Received By:		Date / Time:
I.	(Signature)	3/3/22
Marian	(Print)	10:10 Am
II.	(Signature)	
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Engineering Progress

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

Matrix New World Engineering, Land Surveying and Landscape Architecture, PC
26 Columbia Turnpike
Florham Park, New Jersey 07932

B22030087

PROJECT INFORMATION

Client: DPMC Project Name: Washington Crossing State Park Visitor Center Location: 355 Washington Crossing Pennington Road, Titusville, NJ Date: 02/10/2022 Email Results to: Hazmat.Labs@matrixneworld.com	Matrix Project No. 20-932 Requested Analysis ☐ ~~NYS ELAP 198.1~~ ☑ EPA/600/R-93 ☐ ~~NYS ELAP 198.2~~ ☑ PLM EPA NOB-EPA/600/R-93 ☐ ~~NYS ELAP 198.6~~ ☑ TEM EPA NOB - EPA 600/R-93 ☐ ~~NYS ELAP 198.8~~ ☐ Other (specify)	Project Manager: Matt Sheldon Investigator(s): Matt Sheldon & Thomas Nettles Turn Around Time ☐ STAT ☐ 48 Hour ☐ 5 Day ☐ Other (specify) ☐ 12 Hour ☐ 72 Hour ☑ 1 Week

BULK SAMPLE INFORMATION

HA No.	Floor	Bulk Sample ID No.	Homogeneous Material	Material Type	Sample Location	Quantity (SF/LF/Units)	Asbestos Content	Analysis		
								PLM	PLM-NOB	TEM
16	Ext.	16-01	Exterior Frame Caulk	Misc.	West Entrance				x	x
	Ext.	16-02	Exterior Frame Caulk	Misc.	South Gallery Window				x	x
17	Ext.	17-01	Tar Paper Beneath Siding	Misc.	Rear Enclosure				x	x
	Ext.	17-02	Tar Paper Beneath Siding	Misc.	Rear Enclosure				x	x
18	Ext.	18-01	Exterior Gypsum Board	Misc.	Rear Enclosure			x		
	Ext.	18-02	Exterior Gypsum Board	Misc.	Rear Enclosure			x		
19	Roof	19-01-L1	Roofing Composite Tar	Misc.	Lower Roof				x	x
	Roof	19-02-L1	Roofing Composite Tar	Misc.	High Roof				x	x
	Roof	19-01-L2	Roofing Composite Mineral Board	Misc.	Lower Roof			x		
	Roof	19-02-L2	Roofing Composite Mineral Board	Misc.	High Roof			x		
	Roof	19-01-L3	Roofing Composite Roll-Out Roofing	Misc.	Lower Roof				x	x
	Roof	19-02-L3	Roofing Composite Roll-Out Roofing	Misc.	High Roof				x	x
20	Roof	20-01	Gravel Stop Flashing Tar	Misc.	Lower Roof				x	x
	Roof	20-02	Gravel Stop Flashing Tar	Misc.	High Roof				x	x

CHAIN OF CUSTODY

Relinquished By:		Date / Time:
I. Matt Sh	(Signature)	2/20/22
Matt Sheldon	(Print)	
II.	(Signature)	
	(Print)	

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I.	(Signature)	3/3/22
Marian	(Print)	1010A
II.	(Signature)	
	(Print)	

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Engineering Progress

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

Matrix New World Engineering, Land Surveying and Landscape Architecture, PC
26 Columbia Turnpike
Florham Park, New Jersey 07932

B22030087

PROJECT INFORMATION

Client: DPMC Project Name: Washington Crossing State Park Visitor Center Location: 355 Washington Crossing Pennington Road, Titusville, NJ Date: 02/10/2022 Email Results to: Hazmat.Labs@matrixneworld.com	Matrix Project No. 20-932 Requested Analysis ☐ ~~NYS ELAP 198.1~~ ☑ EPA/600/R-93 ☐ ~~NYS ELAP 198.2~~ ☑ PLM EPA NOB-EPA/600/R-93 ☐ ~~NYS ELAP 198.6~~ ☑ TEM EPA NOB - EPA 600/R-93 ☐ ~~NYS ELAP 198.8~~ ☐ Other (specify)	Project Manager: Matt Sheldon Investigator(s): Matt Sheldon & Thomas Nettles Turn Around Time ☐ STAT ☐ 48 Hour ☐ 5 Day ☐ Other (specify) ☐ 12 Hour ☐ 72 Hour ☑ 1 Week

BULK SAMPLE INFORMATION

HA No.	Floor	Bulk Sample ID No.	Homogeneous Material	Material Type	Sample Location	Quantity (SF/LF/Units)	Asbestos Content	Analysis		
								PLM	PLM-NOB	TEM
21	Roof	21-01	Roof Drain Flashing Tar	Misc.	Lower Roof Drain				x	x
	Roof	21-02	Roof Drain Flashing Tar	Misc.	↓				x	x
22	Roof	22-01-L1	Flashing Composite Tar	Misc.	Flashing Along wall Between the low and high Roof				x	x
	Roof	22-02-L1	Flashing Composite Tar	Misc.	↓ ↓ ↓				x	x
	Roof	22-01-L2	Flashing Membrane	Misc.					x	x
	Roof	22-02-L2	Flashing Membrane	Misc.					x	x
23	Roof	23-01	Roll-Out Foor Membrane	Misc.	Pitched Roof Between Low and High Roofs				x	x
	Roof	23-02	Roll-Out Foor Membrane	Misc.	Pitched Roof Between Low and High Roofs				x	x
24	Roof	24-01	Flashing Tar	Misc.	Top of Pitched Roof Between Low and High Roofs				x	x
	Roof	24-02	Flashing Tar	Misc.	Top of Pitched Roof Between Low and High Roofs				x	x

CHAIN OF CUSTODY

Relinquished By:		Date / Time:
I. Matt Sheldon	(Signature)	2/20/22
Matt Sheldon	(Print)	
II.	(Signature)	
	(Print)	

Received By:		Date / Time:
I.	(Signature)	3/3/22
Marian	(Print)	10:10 Am
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EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn: **Matthew Sheldon**
Matrix New World Engineering
26 Columbia Turnpike
Florham Park, NJ 07932
Phone: (973) 240-1800
Fax: (973) 240-1818

3/21/2022

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 3/3/2022. The results are tabulated on the attached data pages for the following client designated project:

20-932-Washington Crossing State Park Visitor Center

The reference number for these samples is EMSL Order #012203310. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Approved By:

Owen McKenna, Chemistry Laboratory Director

The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, CA ELAP 1877

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order: 012203310
CustomerID: MATX53
CustomerPO:
ProjectID:

Attn: **Matthew Sheldon**
Matrix New World Engineering
26 Columbia Turnpike
Florham Park, NJ 07932

Phone: (973) 240-1800
Fax: (973) 240-1818
Received: 3/3/2022 09:50 AM

Project: **20-932-Washington Crossing State Park Visitor Center**

Analytical Results

Client Sample Description PCB-HA-16
Ext. frame caulk

Collected: 2/10/2022

Lab ID: *012203310-0001*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*		*Analysis Date & Analyst*	
GC-SVOA								
3546/8082A	Aroclor-1016	ND D	0.91	mg/Kg	3/14/2022	BP	3/15/2022 00:00	TL
3546/8082A	Aroclor-1221	ND D	0.91	mg/Kg	3/14/2022	BP	3/15/2022 00:00	TL
3546/8082A	Aroclor-1232	ND D	0.91	mg/Kg	3/14/2022	BP	3/15/2022 00:00	TL
3546/8082A	Aroclor-1242	ND D	0.91	mg/Kg	3/14/2022	BP	3/15/2022 00:00	TL
3546/8082A	Aroclor-1248	ND D	0.91	mg/Kg	3/14/2022	BP	3/15/2022 00:00	TL
3546/8082A	Aroclor-1254	ND D	0.91	mg/Kg	3/14/2022	BP	3/15/2022 00:00	TL
3546/8082A	Aroclor-1260	ND D	0.91	mg/Kg	3/14/2022	BP	3/15/2022 00:00	TL
3546/8082A	Aroclor-1262	ND D	0.91	mg/Kg	3/14/2022	BP	3/15/2022 00:00	TL
3546/8082A	Aroclor-1268	ND D	0.91	mg/Kg	3/14/2022	BP	3/15/2022 00:00	TL

Definitions:
MDL - method detection limit
J - Result was below the reporting limit, but at or above the MDL
ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit (Analytical)
D - Dilution Sample required a dilution which was used to calculate final results

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
PHONE: 1-800-220-3675
FAX: (856) 786-5974

Environmental Chemistry Chain of Custody

EMSL Order Number (*Lab Use Only*): 012203310

Report To Contact Name: Matthew Sheldon		**Bill To Company:** Matrix New World Engineering, P.C.	
Company Name: Matrix New World Engineering, P.C.		**Attention To:**	
Street: 26 Columbia Turnpike		**Street:** 26 Columbia Turnpike	
City: Florham Park	**State/Province:** NJ **Zip Code:** 07932	**City:** Florham Park	**State/Province:** NJ **Zip Code:** 07932
Phone : 973-240-1800	**Fax :** 973-240-1818	**Phone:** 973-240-1800	**Fax:** 973-240-1818
Project Name: 20-932 - Washington Crossing State Park Visitor Center		**U.S. State where Samples Collected:** NJ	
Number of Samples in Shipment:	**Date of Shipment:**	**Purchase Order:**	**Sampled By (Signature):**
Please Provide results: ☐ FAX ☑ E-mail ☐ Mail		**Email Results To:** msheldon@matrixneworld.com	
Standard Turnaround Time: ■ 2 Weeks		**The following TAT's are subject to lab approval:** ☐ 1 Week ☐ 4 Days ☐ 3 Days ☐ 2 Days ☐ 1 Day	

Failure to complete will hinder processing of samples

	Client Sample ID	Comp	Grab	Date/Time	Matrix (W=Water, S=Soil, A=Air, SL=Sludge, O= Other)	Preservative (1=HCL, 2=HNO3, 3=H2SO4, 4=ICE, 5=Other)	List Test(s) Needed: PCB	List Test(s) Needed: PCB Cavity 35 46 /8 08 2A	Comments
(1)	PCB-HA-16	X		2/10/22	O	5		X	Ext. Frame Cavity

Released By (Signature)	Date & Time	Received By	Date & Time
Matt Sh	2/21/22	Colleen Palladino	3/3/22 9:50AM

Please indicate reporting requirements: ☐ Results Only ☐ Results and QC ☐ Reduced Deliverables ☐ Disk Deliverable ☐ Other _____

Instructions or Comments:
Email; Matt Sheldon at msheldon@mnwe.com

18.9°C rec'd in plastic

GEOTECHNICAL ASSESSMENT REPORT

STATE OF NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
NEW VISITOR CENTER
WASHINGTON CROSSING STATE PARK
TITUSVILLE, NEW JERSEY
PROJECT NO. P1222-00

MATRIXNEWORLD

Engineering Progress

Prepared for:

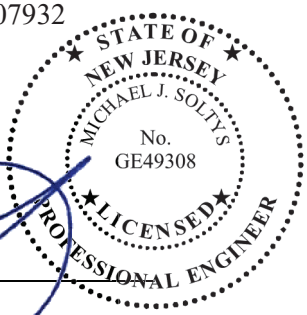
State of New Jersey
Department of the Treasury
Division of Property Management and Construction
Trenton, New Jersey 08625

Prepared by:

Matrix New World Engineering, Land Surveying
and Landscape Architecture, P.C.
26 Columbia Turnpike
Florham Park, New Jersey 07932

Matrix No. 20-932

February 2022



Michael J. Soltys, P.E.
NJ Professional Engineer License No. 24GE04930800

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C. (Matrix) has completed a geotechnical assessment to support the proposed construction at Washington Crossing State Park in Titusville, New Jersey (Site). A Site Location Map is provided as Figure 1.

Matrix provided geotechnical services as a consultant to the New Jersey Division of Property Management and Construction (DPMC). The purpose of the geotechnical assessment was to evaluate the suitability of the on-site soils for the proposed construction of a new Visitor Center. A total of 7 geotechnical borings were advanced to depths of 6 to 18 feet below ground surface (bgs). Four test pits and one permeability test were also conducted at the Site to obtain soil profile and drainage characteristics of the existing subsurface soils.

Matrix's geotechnical recommendations are based on an evaluation of the subsurface conditions as indicated by the field exploration data and geotechnical laboratory test results on representative soil samples. These recommendations will address the geotechnical components of the anticipated construction to ensure that the proposed loads can be safely transferred to the underlying soil.

2.0 SITE LOCATION & PROJECT DESCRIPTION

The Site is located at the Washington Crossing State Park in Titusville, New Jersey. A Site Location Map is provided as Figure 1. The subsurface field program was conducted within the south corner of the park, near the existing overlook.

The design intent for this project is to construct a new Visitor Center. The new Visitor Center will include an auditorium/theater, workspace for the museum staff, gift shop with storage and a climate controlled and secured artifact storage space, along with all the accompanying utilities. The building will be just under 15,000 square feet and will incorporate green technology.

To assist in the future design and construction within the project area, geotechnical borings were advanced within the expected construction area to obtain information regarding the soil's structural properties. Four test pits were excavated to obtain soil profile information at the proposed locations of a septic field and stormwater basin. A permeability test was also performed above the water table to observe the drainage potential of the existing on-site soils at the potential location of a stormwater basin. The 7 borings and permeability test were located to provide the most useful information about the subsurface conditions. Refer to Figure 2 of this report for a map of the as-drilled boring and test pit locations.

3.0 GEOLOGIC SETTING

According to the Bedrock Geologic Map of New Jersey (dated 2014), the Site location is founded on the Passaic Formation, where Sandstone, siltstone, and shale are likely to be encountered. A Geologic Map is provided as Figure 3.

From the Surficial Geologic Map of Central and Southern New Jersey (dated 2000), the natural surface material (beyond fill) is suggested to be silty clayey to sandy silty sandstone, siltstone, and shale residuumr. The Surficial Geology map is shown in Figure 4.

The soil descriptions presented above are consistent with the findings from the subsurface field program, in which Silt was observed throughout the length of each boring, with varying amounts of Sand. Below the Silt layer, Mudstone bedrock was encountered.

4.0 SUBSURFACE FIELD PROGRAM

The subsurface field program was completed by generally accepted practices in the Geotechnical Engineering field and consisted of the advancement of 7 Standard Penetration Test (SPT) borings via mud rotary drilling techniques and 4 test pits via an excavator.

A Matrix Geotechnical Engineer provided full-time drilling oversight, soil logging, and sample collection. Matrix prepared the field boring logs, which included sample depths, SPT-N blow counts, soil/rock recovery, and soil/rock descriptions based on the Burmister Soil Classification System followed by the Unified Soil Classification System (USCS) letter symbol. The soil boring logs are provided in Appendix A. Classification tables and charts used to determine the soil attributes are included in Appendix B.

Upon the completion of the field program, representative samples were subjected to geotechnical laboratory analyses. Laboratory results aided in soil and rock classification and assessing the relevant engineering properties of the stratigraphic layers which were used in developing the revised geotechnical design recommendations outlined herein. Geotechnical laboratory reports are included in Appendix C.

4.1 SPT Borings

Matrix retained Craig Geotechnical Drilling Co., Inc. (Craig) located in Mays Landing, New Jersey, to complete the subsurface field program under observation of a Matrix Geotechnical Engineer qualified in Geotechnical Engineering in New Jersey. On September 13, 2019, 7 borings (B-1 through B-7) were advanced with a CME 850 to depths of 6 to 18 feet bgs. The locations of the completed borings were identified in the field by taping and line of sight measurements. The approximate as-drilled boring locations are shown on Figure 2.

Split spoon (SS) samples were collected in accordance with ASTM D-1586, *Standard Method for Penetration Test and Split-Barrel Sampling of Soils*. A standard 2-inch outer diameter split spoon, two feet in length, was used to collect the soil samples. An automatic 140-pound hammer having a 30-inch drop was used to drive the split spoon sampler. SPT blow counts were recorded for the 0- to 6-inch interval, the 6- to 12-inch interval, the 12- to 18-inch interval and the 18- to 24-inch interval. The SPT N-values for design purposes are reported as the sum of the SPT N-values observed for the above referenced 6- to 12-inch interval and the 12- to 18-inch interval that the split spoon sampler was driven. Rock coring was not performed. However, the type of rock encountered is comparatively soft and samples was possible using a split spoon.

SPT N-values can be used to provide a qualitative indication of the in-place relative density for cohesionless soils and, in a less reliable way, an indication of consistency for cohesive soils. They can also be used to approximate soil strength properties. The indications are qualitative, since many factors can significantly affect N-values and prevent direct correlations, including differences among drill crews, drill rigs, drilling procedures, and hammer-rod-sampler assemblies.

The Matrix Geotechnical Engineer observed the split spoon sampling procedure and collected representative samples in sealed containers for further examination. Each boring was continuously sampled to 12 feet bgs and at every subsequent 5-foot interval thereafter, unless noted otherwise on the boring logs (Appendix A). The borings were backfilled with soil cuttings and bentonite hole plug (if necessary), patched with asphalt patch, or grouted upon completion of the borehole.

4.2 Test Pits

In addition to soil borings and split spoon sampling, 4 test pits were excavated to obtain soil profile information. Matrix retained Heritage Contracting Company (Heritage), located in Cranbury, New Jersey to advance a test pits under observation of a Matrix Geotechnical Engineer qualified in Geotechnical Engineering in New Jersey. On September 15, 2021, 4 test pits were advanced with a CAT 308C excavator to depths where rock refusal was observed. Test pits TP-B1 and TP-B2 were advanced to 14.5 and 15 feet bgs, respectively, at the potential location of a stormwater basin. Test pits TP-S1 and TP-S2 were advanced to 10.5 and 11 feet bgs, respectively, at the potential location of a septic field. The locations of the completed test pits were identified in the field by taping and line of sight measurements. The approximate locations are shown on Figure 2.

4.3 Permeability Testing

A permeability test was performed in general conformance with the NJDEP Stormwater Best Management Practices Manual via the double ring infiltrometer test method in TP-B2 at a depth of 5 feet. The double rings were inserted into the soil 2 to 3 inches then filled with water to allow presoaking. Presoaking was completed for two intervals of up to 30 minutes. The rings were then refilled, and the water level was measured in 10-minute intervals. When the drop in water level was stabilized, the permeability was calculated.

4.4 Laboratory Testing

In addition to the field program, a laboratory testing program was conducted to determine additional pertinent engineering characteristics of representative samples of on-site soils. The laboratory testing program was performed in general accordance with applicable ASTM standard test methods and included physical/textural testing of representative samples of various strata.

Upon review of the boring logs, Matrix selected representative samples for laboratory testing. Laboratory testing of selected samples was completed by TerraSense, LLC, located in Totowa, New Jersey. The following table presents a summary of the testing program.

Table 4.1: Laboratory Testing Program

Test	Testing Procedure	Number of Samples Tested	Sample Locations and Depth Intervals
Water Content	ASTM D2216	6	B-1: 4-6’ B-2: 10-11.7’ B-3: 10-12’ B-4: 4-6’ B-6: 6-8’ B-7: 4-6’
Sieve Analysis	ASTM D6913	6	B-1: 4-6’ B-2: 10-11.7’ B-3: 10-12’ B-4: 4-6’ B-6: 6-8’ B-7: 4-6’
Atterberg Limits	ASTM D4318	3	B-1: 4-6’ B-4: 4-6’ B-7: 4-6’
Permeability Class Rating (Double Point)	NJ 7:9A-6.3	3	TP-S2: 4’, 5’, 7.2’

The results of the laboratory testing program, provided in Appendix C, were used to assist in developing geotechnical design parameters and recommendations.

5.0 SUBSURFACE CONDITIONS

The subsurface conditions beneath the Site can be characterized by the following stratigraphy, proceeding from the surface cover downward, unless noted otherwise below. The USCS group symbol for each soil type is indicated in parentheses following the soil descriptions on the boring logs. The various soil types were grouped into the major strata shown on the boring logs. The stratification lines designating the interfaces between strata on the boring logs should be considered approximate. In situ, these transitions could be gradual and could occur at slightly different levels from those indicated by the boring logs. The rest pits showed similar soil profiles to the borings. Soil boring logs are provided in Appendix A. Classification tables and charts used to determine the soil attributes are included in Appendix B.

Surface Cover

All borings were completed within a grass area, at the south corner of the park. As such, the surficial material consisted of grass and topsoil at each boring.

Stratum 1: Silty Sand/Silt (SM, ML)

Underlying the grass surface cover, a layer of brown silty sand material was encountered with varying amount of silt. This layer generally extended to depths ranging from 5 to 8 feet bgs. The SPT N-values for Stratum 1 typically indicated very loose to loose Silt material, with values ranging from 1 to 13 blows per foot (bpf). Medium dense Silt was encountered at the bottom of the Stratum. The SPT N-values for Stratum 1 are summarized in the table below.

Table 5.1: Very Loose/Loose SPT N-Values for Stratum 1

Soil Boring Location	USCS Group Symbol	Depth Below Ground Surface (ft)	SPT N-Values
B-1	SM	0-6	1-3
B-2	SM	0-8	2-8
B-3	SM	0-4	2-7
B-4	ML	0-6	1-3
B-5	ML	0-5	3-7
B-6	ML	0-4	2-3
B-7	SM	0-4	3-6

Table 5.2: Medium Dense SPT N-Values for Stratum 1

Soil Boring Location	USCS Group Symbol	Depth Below Ground Surface (ft)	SPT N-Values
B-3	SM	4-6	13
B-6	ML	4-5	11
B-7	SM	4-6	10

Stratum 2: MUDSTONE (DECOMPOSED ROCK)

Underlying the Silt layer, Mudstone rock was encountered. This type of rock is softer than most. As such, it was able to be sampled using a split spoon. When sampled, it broke down into sand, silt, and gravel size fragments. The SPT N-values for Stratum 2 typically indicated very dense material, with some medium dense material near the top of the layer in some borings. Values ranged from 16 to over 100 blows per foot. The SPT N-values for Stratum 2 are summarized in the table below.

Table 5.3: Medium Dense SPT N-Values for Stratum 2

Soil Boring Location	Depth Below Ground Surface (ft)	SPT N-Values
B-2	8-11.7	22
B-3	6-8, 10-12	17, 16-22
B-6	5-6	25

Table 5.4: Dense/Very Dense SPT N-Values for Stratum 2

Soil Boring Location	Depth Below Ground Surface (ft)	SPT N-Values
B-1	6-8.25	61-over 100
B-2	15-16.25	Over 100
B-3	8-10, 17-18.5	35, over 100
B-4	6-11.5	31-over 100
B-5	5-6.3	Over 100
B-6	6-10	62-over 100
B-7	6-6.5	Over 100

Groundwater

While most of the samples taken were dry, wet soil was observed at the bottom of the Silt layer in borings B-3 and B-4 at depths of 6 and 5.5 feet, respectively. This wet section was only about 4 inches thick. The Mudstone rock immediately below it was observed to be dry or slightly moist. Thus, it is likely that a perched water table exists just above rock. A similar situation was observed in test pits TP-S1 and TP-S2, where water was found approximately 2-3 inches above hard rock. The absence or presence of groundwater in the borings reflects the conditions at the time of the subsurface exploration only. Fluctuations in the locations of groundwater tables or the presence of perched water levels could occur as a result of seasonal variations in evaporation, precipitation, surface water run-off, and other factors. Therefore, water levels at future times could vary from those observed at the time of the borings.

6.0 GEOTECHNICAL DESIGN PARAMETERS

6.1 General Subsurface Parameters

The geotechnical design parameters in this report are derived from the field program and are based on accepted geotechnical standards and practices.

Table 6.1 summarizes the recommended geotechnical design parameters for the various soil strata encountered at the Site. The values are based on review and interpretation of the subsurface field program and laboratory test data results.

Table 1806.2 of the 2021 International Building Code provides allowable coefficients of friction to be used in the evaluation of resistance to sliding. For the native dense granular soil and Controlled Fill, the recommended coefficient of friction against sliding is 0.25.

Table 6.1: Geotechnical Design Parameters

Stratum	Unit Weight	Friction Angle (Φ)	Cohesive Strength, c_u	Earth Pressure Coefficient		Net Allowable Foundation Pressure*	Lateral Bearing
				Active	Passive		
	(pcf)	(deg)	(psf)	(Ka)	(Kp)	(psf)	(psf/ft. bgs)
Controlled Fill	γ = 125 γ' = 63	32°	0	0.31	3.26	4,500	200
Native Dense Decomposed Rock (SP, SP-SM, SM) [Class 2, SPT N > 10]	γ = 125 γ' = 63	35°	0	0.27	3.69	4,500	200
Native Loose Granular Soil (SP, SP-SM, SM) [Class 5, SPT N ≤ 10]	γ = 105 γ' = 43	30°	0	0.33	3.00	1,500	150
Silt (ML) Loose [Class 5, SPT N < 10]	γ = 90 γ' = 28	26°	150	0.39	2.56	N/A	75
Silt (ML) Medium [Class 5, 10 ≤ SPT N ≤ 30]	γ = 115 γ' = 53	28°	400	0.36	2.77	1,500*	100

Notations: γ = moist unit weight, γ ' = buoyant unit weight, and c_u = average undrained shear strength.

* These values are based on the 2018 International Building Code and adjusted for field conditions encountered. To increase the allowable foundation pressure above the values recommended in the table given above, further testing of soil will be required. In Cohesive soils, it should be noted that the shallow footing may fail under the settlement criteria before the footing pressure approaches the anticipated allowable bearing capacity. Allowable Foundation Pressure values assume the water table is below the influence depth of the foundation.

- Coefficient of earth pressure at rest may be computed using Jaky's equation, Ko = 1 – Sin ϕ'.

6.2 Seismic Design Parameters

Based on a review of the subsurface conditions relevant to section 1613 of the 2021 International Building Code New Jersey Edition, the subject site may be classified as a Site Class C. For a Risk Category equal to I/II/III and 0.2 Second Design Acceleration (S_{DS}) equal to 0.173 g, the subject site may be assigned to Seismic Design Category (SDC) B. Seismic design parameters are presented in the table below.

Table 6.2: Seismic Design Parameters

Parameter	Value*
0.2 sec. Bedrock Acceleration, S_s	0.20 *g*
1.0 sec. Bedrock Acceleration, S_1	0.053 *g*
Site Class	C
0.2 sec. Site Coefficient, F_a	1.3
1.0 sec. Site Coefficient, F_v	1.5
0.2 sec. Design Acceleration, S_{DS}	0.173 *g*
1.0 sec. Design Acceleration, S_{D1}	0.053 *g*
Seismic Design Category, SDC	B

* Value(s) obtained from the IBC Section 1613, Earthquake Loads. The "*g*" is acceleration due to gravity, and $g = 32.2$ ft/s^2 or 9.81 m/s^2.

Liquefaction is the full or partial loss of shear strength of granular or cohesionless soils during an earthquake. The potential consequences of liquefaction could include loss of bearing capacity causing collapse or excessive settlement of ground. Potentially liquefiable soil types include loose and medium dense clean sands, silty sands and silts below the water table and to a depth of 50-feet below the ground surface. Due to the absence of a groundwater table and the shallow depth of rock, liquefaction was deeped to no be an issue.

6.3 Permeability Rates of Existing On-Site Soils

A total of 4 test pits (TP-B1, TP-B2, TP-S1, and TP-S2) were advanced as part of the subsurface investigation on September 15, 2021. Test pits TP-B1 and TP-B2 were located based on an approximate location of a proposed stormwater basin, and test pits TP-S1 and TP-S2 were located based on an approximate location of a proposed septic field. Please note that laboratory testing labeled TP-1 and TP-2 refers to TP-S1 and TP-S2 within the report. Permeability testing was conducted via the double ring infiltrometer method in TP-B1, and permeability rates were calculated in accordance with the NJDEP Stormwater Best Management Practices Manual. The observed permeability was 7.88 inches per hour at a depth of 5 feet bgs. According to Table 12-10 of the NJ Stormwater BMP Manual Chapter 12: Soil Testing Criteria, this classifies the soil under Soil Hydraulic Conductivity Class K4.

Soil samples for permeability testing were taken from the septic field test pit TP-S2 at depths of 4, 5, and 7.2 feet bgs. Samples were delivered to Terrasense, LLC in Totowa, New Jersey for testing. The permeability class rating test was performed with the soil samples to ascertain the drainage characteristics of the soil within each field. Testing details are summarized in Table 6.3. Laboratory testing results are presented in Appendix C.

Table 6.3 – Permeability Testing Summary

Test Pit Location	Sample	Sample Depth (ft bgs)	Permeability Class Rating
TP-S2	1	4	K2
TP-S2	2	5	K2
TP-S2	3	7.2	K1

7.0 GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

The following sections present the results of our geotechnical engineering evaluation and recommendations for support of the planned construction.

7.1 Site Preparation and Earthwork

Prior to demolition and stripping operations, all utilities should be identified and protected. Existing pavements, topsoil, organic matter (i.e., trees, roots, vegetative matter), debris, and deleterious materials should be removed at least five feet beyond the limits of the proposed structure areas.

All remaining underground utilities and utility backfill should be evaluated to determine if these elements are suitable for support of the planned loads. The Contractor must keep those utilities to be reused in workable condition and protected from damage during earthwork activities. Utilities not planned for re-use should be removed from planned structural areas, capped off at the property lines, and either removed or abandoned in place. All soils disturbed by utility abandonment operations should be removed or re-compacted in-place under observation of a geotechnical engineer.

Prior to placing any fill materials to raise grades to designed subgrade elevations as necessary, the existing exposed subgrade soils should be compacted to a firm and unyielding surface with several passes in two perpendicular directions of a minimum 10-ton vibratory, smooth drum roller. To help identify any soft or loose pockets which may require removal and replacement or further attention after compaction of the subgrade, the surface should be proof-rolled in the presence of the owner's geotechnical engineer. Typical equipment used for the proof-rolling effort consists of a fully loaded tandem axle truck; if site constraints limit the use of this equipment, equivalent alternatives may be considered subject to engineer approval. Proof-rolling should be conducted after a suitable period of dry weather to avoid degrading an otherwise acceptable subgrade. Any fill or backfill should be placed and compacted in accordance with the recommendations provided herein. If construction activities are performed during winter months, all frozen soils encountered at or below proposed subgrade elevations should be removed and replaced with controlled fill in accordance with the recommendations herein.

Every effort should be made to minimize disturbance of the on-site soils by construction traffic and surface runoff. The on-site soils will deteriorate when subjected to repeated construction traffic and will likely require removal and replacement. Any type of disturbance to moisture-sensitive soils can potentially affect settlement, bearing capacity, and the shrinkage/swelling of clays. The services of a geotechnical engineer

should be retained to observe soil conditions during construction and verify the suitability of prepared foundations for support of the design loads.

Organic and plastic soil types, if encountered at the site, can be used as fill materials in landscape areas. Any such materials encountered during grading operations should be either stockpiled for later use in landscape fills, or should be placed in approved disposal areas either on-site or off-site.

Development of the Site during periods of favorable weather and stringent quality control of soil moisture will be critical to construction schedules. Construction haul roads should be constructed throughout the Site prior to the start of construction to maintain Site access and construction traffic. If the surface soils contain materials that may be erodible, the Contractor should provide and maintain good site drainage during earthwork operations to help to maintain the integrity of the surface soils. All erosion and sedimentation practices should be in accordance with sound engineering practice and current local requirements. Surface water should be directed away from the construction area, and the work area should be sloped at gradients of 1 percent and sealed at the end of each day with a smooth static drum roller to minimize the potential for ponding water and subsequent saturation of the surface soils. If subgrade soils are overly wetted, over excavation should be anticipated.

7.2 General Foundation Recommendations

Based on the results of the subsurface investigation, Matrix anticipates that the existing subsurface soils will be capable of supporting the proposed structures using shallow foundations. The finished foundations should be installed at least 3 feet bgs to protect the structures' foundations from possible frost heave during cold weather conditions. This assumed frost depth should be confirmed with the local jurisdictional building department prior to construction activities.

Actual bearing conditions of soil materials within shallow footing areas should be confirmed in the field during excavation, by inspection, under the direction of a Professional Engineer registered in the State of New Jersey.

Should any unsuitable materials be encountered beneath the proposed foundation bearing depths, over-excavation and replacement of the unsuitable materials will be required to provide a suitable footing subgrade. Approximately six inches of existing soil below the foundation bottom is recommended to be replaced with ¾-inch clean crushed stone to serve as a "cushioning layer" for uniform transition of structural

loads to the underlying subsurface. All foundation bottoms should be completely cleaned of loose material or debris and maintained in a dry condition immediately prior to the placement of the subgrade base course.

All foundation excavations must be protected to prevent the disturbance of the subgrade materials and to minimize any potential loss of support capacity. To minimize disturbance to the subgrade soils during excavation, we recommend that a bucket without scarifying teeth, in addition to hand excavation methods, be used during the final phases of the excavation for the foundations. Foundation concrete generally should be placed for foundations during the same day that the foundation excavations are made and approved. Should excavating and placing the foundation concrete the same day not be practical, or if groundwater levels are close to the footing subgrades, it is recommended that a concrete mud mat, 2 to 3 inches thick, be placed to protect the subgrade soils from moisture changes and disturbance. If protection of the soils is not provided, then undercutting of softened soils may be necessary prior to the placement of reinforcing steel and foundation concrete.

Any over-excavation to be restored with Controlled Fill will need to extend at least one foot laterally beyond footing edges for each vertical foot of over-excavation. Lateral over-excavation can be reduced if the grade is restored with lean concrete or approved flowable fill. The bottom of over-excavations should be compacted with walk-behind compactors, vibrating plates or plate tampers ("jumping jacks") to compact locally disturbed materials.

Shallow Foundations

Based on information obtained during the current subsurface investigation, Matrix has provided an option for the proposed structures to be supported by conventional shallow foundations.

Excavation for shallow foundations should proceed down to the decomposed rock layer. The depth of the decomposed rock layer varies between 5 and 8 feet below grounds. Foundation bottom elevation can then be raised by adding controlled fill as described in Section 7.5. Alternatively, foundation footings can be poured on the decomposed rock layer. Either method will achieve an expected bearing capacity of 4,500 pounds per square foot.

A settlement analysis performed using the software Settle3 by Rocscience for footings as big as 6 by 6 feet showed that the maximum expected settlement is less than 0.3 inches. Differentiatial settlement between a 6 by 6 feet footing and the smallest proposed footing (3 by 3 feet) is expected to be 0.2 inches. These results

fall below the typical maximum tolerable limits of 1 inch for total settlement and 0.5inches for differential settlement.

To ensure adequate frost protection, the shallow foundation bottoms should be placed at least 36” below the finished grade, provided the respective allowable bearing capacity of the subgrade soil recommended on Table 6.1 meets the footing pressure. If any soft or loose soils are encountered, the unsuitable material should be removed, replaced, and compacted with new Controlled Fill as per Section 7.5 of this report. The excavated subgrade should be protected from prolonged exposure to air and water to minimize the damaging effect of weathering, to provide sufficient bearing capacity and to reduce differential settlement. To protect the subgrade material, it is recommended that the exposed subgrade be covered with at least 4” to 6” of compacted ¾” stone. A professional engineer competent in the field of geotechnical engineering, and registered in the State of New Jersey, should verify the suitability of the subgrade.

Substantial compaction operations in conformance with Section 7.1 should be completed and benchmark elevations measured between passes to confirm no additional settlement or consolidation is encountered. Matrix would also recommend the Contractor allows sufficient time (a minimum of one month) for any additional settlement or consolidation of cohesive materials as a result of the additional fill before foundation or pavement construction operations commence. In order to reduce the possibility of excessive settlement due to local shear or "punching" action, we recommend that column footings have a minimum lateral dimension of 3 feet and continuous wall footings should have a minimum width of 2 feet, even if smaller dimensions can be justified using the allowable bearing capacity provided above. Spread footings need not be symmetrical. Within the core of the building, where foundation loads are highest, footings may be combined as necessary to meet the recommended bearing capacity. If this results in spread footings covering more than about 60% of the core footprint, we recommend that a mat foundation be considered

7.3 Construction Recommendations for Pavements, Slabs, and Utilities and Miscellaneous Site Improvements

The proposed development of the project site is anticipated to include sub-grade for pavements, utilities, and concrete footing construction for miscellaneous site improvement structures. The bottom of the subgrade should be excavated clean so a hard bottom is provided for the support of structures or utility pipes. All fill used to establish the footing subgrade level, as necessary, should be Controlled Fill, placed and compacted under engineering controls as per Section 7.5 of this report. To protect concrete slabs exposed to frost heave, controlled crack joints and shrinkage joints should be provided at regular intervals.

An 8-inch-thick layer of ¾-inch crushed clean stone should be placed as base course between the subgrade and the bottom of the concrete footing slab.

The properly prepared Controlled Fill/backfill materials in paved areas or utility trenches are expected to yield a minimum subgrade modulus (k) of 150 psi/in provided that a minimum of 4 inches of aggregate subbase materials are provided and the subgrade has been prepared in accordance with the recommendations of this report. If any soft or loose soils are encountered, the unsuitable material should be removed, replaced and compacted with new Controlled Fill as per Section 7.5 of this report. Should the thickness of unsuitable soil to be removed be greater than 3 feet in trench or footing areas, deep foundations are recommended as a viable option. If such a situation is encountered, Matrix shall assess and reevaluate a viable deep foundation system. At this moment, Matrix rules out any such situation will be encountered. In the event there is a significant time lag between the site grading work and the fine grading of concrete slab areas prior to the placement of the subbase stone or concrete, the Geotechnical Engineer should verify the condition of the prepared subgrade. Prior to final slab construction, the subgrade may require scarification and re-compaction to provide firm and stable conditions.

If a utility trench excavation becomes soft due to the inflow of surface water or groundwater, a minimum of six inches of crushed stone shall be placed on the bearing soil to provide a firm base for support of the pipe.

It should also be understood that the recommended pavement sections were not designed to support heavy construction equipment loads which would require an augmented section. The contractor should construct temporary haul and construction roadways and routes about the site as appropriate for the specific weather conditions and construction equipment he intends to employ, and the overburden soil conditions encountered in the specific areas. Construction period traffic should not be routed across the recommended pavement sections unless augmented.

We recommend basement slabs and below grade walls be fully dampproofed to limit water vapor infiltration into occupied and moisture sensitive spaces. We recommend a membrane type dampproofing product be used, such as products by W.R. Grace & Co. For horizontal applications, we recommend that the membrane be installed on a 2-inch-thick concrete substrate (mudslab).

7.4 Excavations/Dewatering/Drainage

Excavation near existing foundations shall not remove the existing lateral or vertical support without protecting the existing foundation against settlement or lateral translation by providing underpinning or shoring. Underpinning and shoring should be provided as per Chapter 33 of the 2018 International Building Code. The contractor is solely responsible for construction site safety, including excavation safety. Excavations should be performed in accordance with the requirements of *29 CFR Part 1926, OSHA Safety and Health Regulations for Construction, Excavations*. It is anticipated that excavations will generally be open cut. The fill and underlying soils, above and below the water table, are considered Type C soils. The maximum allowable slopes stipulated by OSHA for Type C soils are 1.5 H:1 V. Flatter slopes may be required based on actual conditions encountered. Actual conditions encountered during construction should be evaluated by a competent person (as defined by OSHA) to ensure that safe excavation methods and/or shoring and bracing requirements are implemented. Sheeting and bracing, if required, should be designed by a Professional Engineer licensed in New Jersey with earth and water pressures, as well as equipment and other surcharge loads, considered.

The groundwater table was observed right above rock during the subsurface investigation. Due to the shallow depth of groundwater, dewatering is expected to be a concern for this project. As noted before, the groundwater table can be impacted by seasonal variations, precipitation, and other climatic factors. Presence of groundwater at foundation depths may severely impede the constructability of structures due to possible inflow of groundwater into the open excavation. The appropriate measures to be taken for groundwater control during construction should be determined in the field at the time of excavation and are the responsibility of the Contractor.

7.5 Controlled Fill

Matrix recommends that portions of the on-site natural soil may be reused for backfilling as Controlled Fill if it meets the requirements provided within this section, is subjected to removal of all unsuitable material such as topsoil, boulders, concrete, brick, organic matter, etc. and is approved by the owner's Professional Engineer licensed in New Jersey and qualified in geotechnical engineering. If the excavated fill material and on-site natural soils cannot be reused, imported structural fill should be used as Controlled Fill. The imported Controlled Fill should be a granular, structurally sound, free-draining fill, free of organic material and any other deleterious material. Controlled Fill should be a natural Sand or Sand and Gravel with no particles larger than three inches and the material passing the No. 200 sieve shall be non-plastic. The chosen Fill soil should meet the gradation of the table below.

Table 7.1: Grain Size Distribution for Controlled Fill

Sieve Size Designation	Percentage Passing by Weight
Passing 3 inch	100
Passing 2 inch	90 – 100
Passing ¼ inch	30 – 70
Passing #10	15 – 60
Passing #40	5 – 40
Passing #200	0 – 10

Controlled Fill shall be placed in lifts not exceeding 12-inches thick, in loose state. Should the Controlled Fill be compacted with a plate compactor or jumping jack compactor, the fill must be placed in lifts not exceeding 8-inches thick, in loose state. Each lift of backfill should be compacted to at least 95 percent of the maximum dry density within three percent of the optimum moisture content, as determined in accordance with the procedures of ASTM D1557, *Laboratory Compaction Characteristics of Soil Using Modified Effort* (56,000 ft-lbf/ft^3 (2,700 kN-M/M^3)). Controlled Fill placed within ten feet of walls, foundations, utility lines and auxiliary structures should be compacted with plate compactors; the lift thickness should be adjusted if necessary to obtain the required degree of compaction. In-place density tests (i.e., nuclear density gauge or equivalent) should be performed at a frequency of not less than one per 2,500 sf of backfill placed, and not less than one test per two feet of material placed. In addition, if compaction is being conducted near an existing foundation, the Controlled Fill shall be placed in lifts and compacted such that it does not damage the existing foundation.

At the end of each workday, all fill areas should be graded to facilitate drainage of any surface runoff associated with precipitation and should be sealed by use of a smooth-drum roller to limit infiltration of surface water. During placement and compaction of new fill, the Contractor should be prepared to scarify existing subgrade soils or previously placed fills so that a weak plane will not be formed between the new fill and existing subgrade soils, as directed by the Geotechnical Engineer. Where and when needed, as directed by the Geotechnical Engineer, the Grading Contractor should scarify subgrade soils to depths of about 4 inches prior to placement of new fills.

Appropriate documentation, with supporting laboratory test results for proposed fill materials, should be submitted for approval prior to its use. Grain size distribution, maximum dry density, optimum water content determinations, and plasticity of the soil should be performed on representative samples of the proposed Controlled Fill.

Preparation of the subgrade and the placement of fill should be performed under the oversight of a qualified geotechnical engineer, or a technician under their direction. No fill material should be placed in areas where free water is standing, on frozen subgrade areas, or on surfaces which have not been approved by qualified geotechnical personnel.

7.6 Supplemental Construction Services

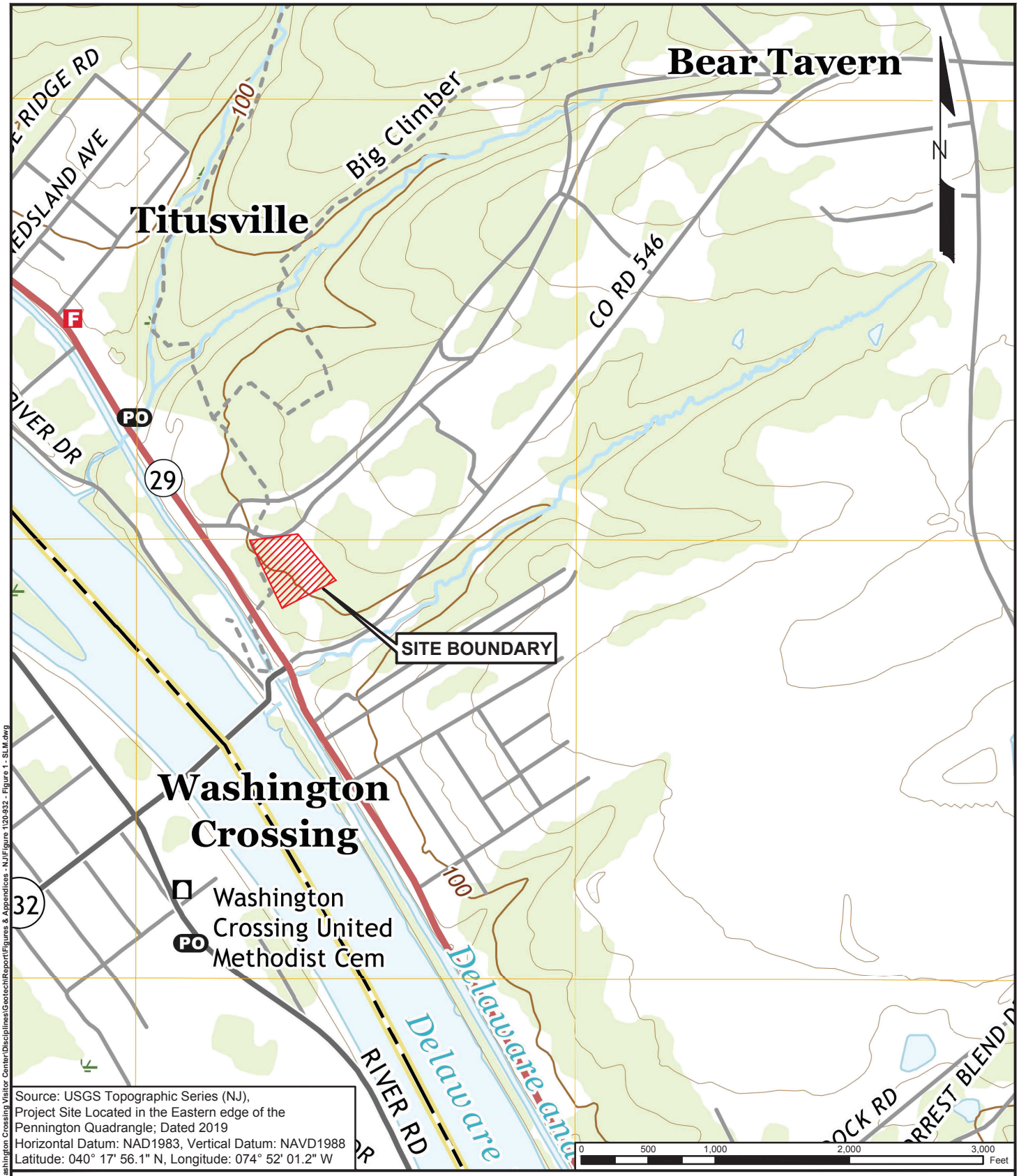
A qualified geotechnical engineer should observe construction and provide testing and consultation as described in previous sections of this report. Monitoring and testing should be performed to verify that suitable materials are used for Controlled Fill, and that they are properly placed and compacted over suitable subgrade soils. The excavated materials and the on-site natural soil to be reused as Controlled Fill shall be approved for reuse by the owner's geotechnical engineer prior to reuse.

8.0 CLOSURE

This report has been prepared to assist DPMC with the proposed design at Washington Crossing State Park in Titusville, New Jersey. The conclusions and recommendations provided within this report were prepared based on our understanding of the project and through the application of generally accepted soils and geotechnical engineering practices and are founded on the information made available to us at the time of the actual writing of the report and the site conditions, surface and subsurface, that existed at the time the exploratory borings were drilled. A further assumption has been made that the limited exploratory borings, in relation both to the area extent of the site and to depth, are representative of general subsurface conditions across the site. Environmental issues (such as potentially contaminated soil and groundwater) are outside the scope of this study and should be addressed in a separate study.

Technical specifications and design drawings should incorporate our recommendations to ensure that subsurface conditions and other geotechnical issues at the site are adequately addressed in the construction documents. No warranties, expressed or implied, are made. Matrix should be notified of any changes to the planned construction or if subsurface conditions differing from those described herein are encountered, so the impact on the geotechnical recommendations can be evaluated.

FIGURES



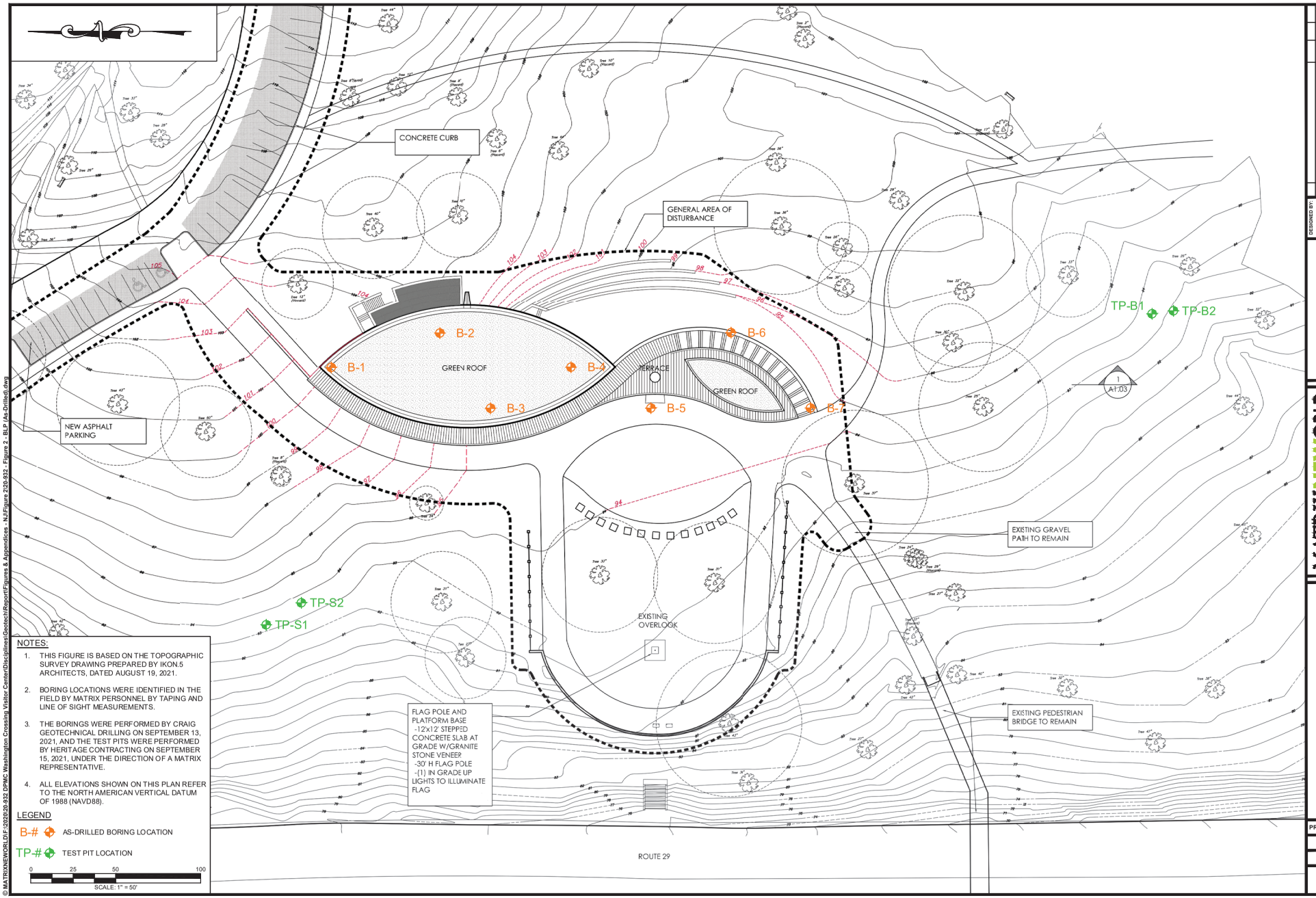
Source: USGS Topographic Series (NJ),
Project Site Located in the Eastern edge of the Pennington Quadrangle; Dated 2019
Horizontal Datum: NAD1983, Vertical Datum: NAVD1988
Latitude: 040° 17' 56.1" N, Longitude: 074° 52' 01.2" W

SITE LOCATION MAP

MATRIXNEWORLD
Engineering Progress
Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
26 Columbia Turnpike
Florham Park, New Jersey 07932
Certified WBE
Tel: 973-240-1800
Fax: 973-240-1818
www.matrixneworld.com

STATE OF NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
WASHINGTON CROSSING STATE PARK NEW VISITOR CENTER
TITUSVILLE, NEW JERSEY 08560

SCALE:	PROJECT NO.:	DATE:	FIGURE NO.:
1" = 1,000'	20-932	SEPTEMBER 2021	1



NOTES:

1. THIS FIGURE IS BASED ON THE TOPOGRAPHIC SURVEY DRAWING PREPARED BY IKON.5 ARCHITECTS, DATED AUGUST 19, 2021.
2. BORING LOCATIONS WERE IDENTIFIED IN THE FIELD BY MATRIX PERSONNEL BY TAPING AND LINE OF SIGHT MEASUREMENTS.
3. THE BORINGS WERE PERFORMED BY CRAIG GEOTECHNICAL DRILLING ON SEPTEMBER 13, 2021, AND THE TEST PITS WERE PERFORMED BY HERITAGE CONTRACTING ON SEPTEMBER 15, 2021, UNDER THE DIRECTION OF A MATRIX REPRESENTATIVE.
4. ALL ELEVATIONS SHOWN ON THIS PLAN REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

LEGEND

B-# AS-DRILLED BORING LOCATION

TP-# TEST PIT LOCATION

0 25 50 100

SCALE: 1" = 50'

NO.	DESCRIPTION	DATE:	BY:	APP:
REVISIONS				

DESIGNED BY: LM

REVIEWED BY: MS

RELEASED BY: MS

MATRIX NEW WORLD Engineering Program
Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
26 Columbia Turnpike
Florham Park, New Jersey 07932
Certified WBE
Tel: 973-240-1800
Fax: 973-240-1818
www.matrixneworld.com
NEW JERSEY CERTIFICATE OF AUTHORIZATION No. 24GA27982300

AS-DRILLED BORING LOCATION PLAN

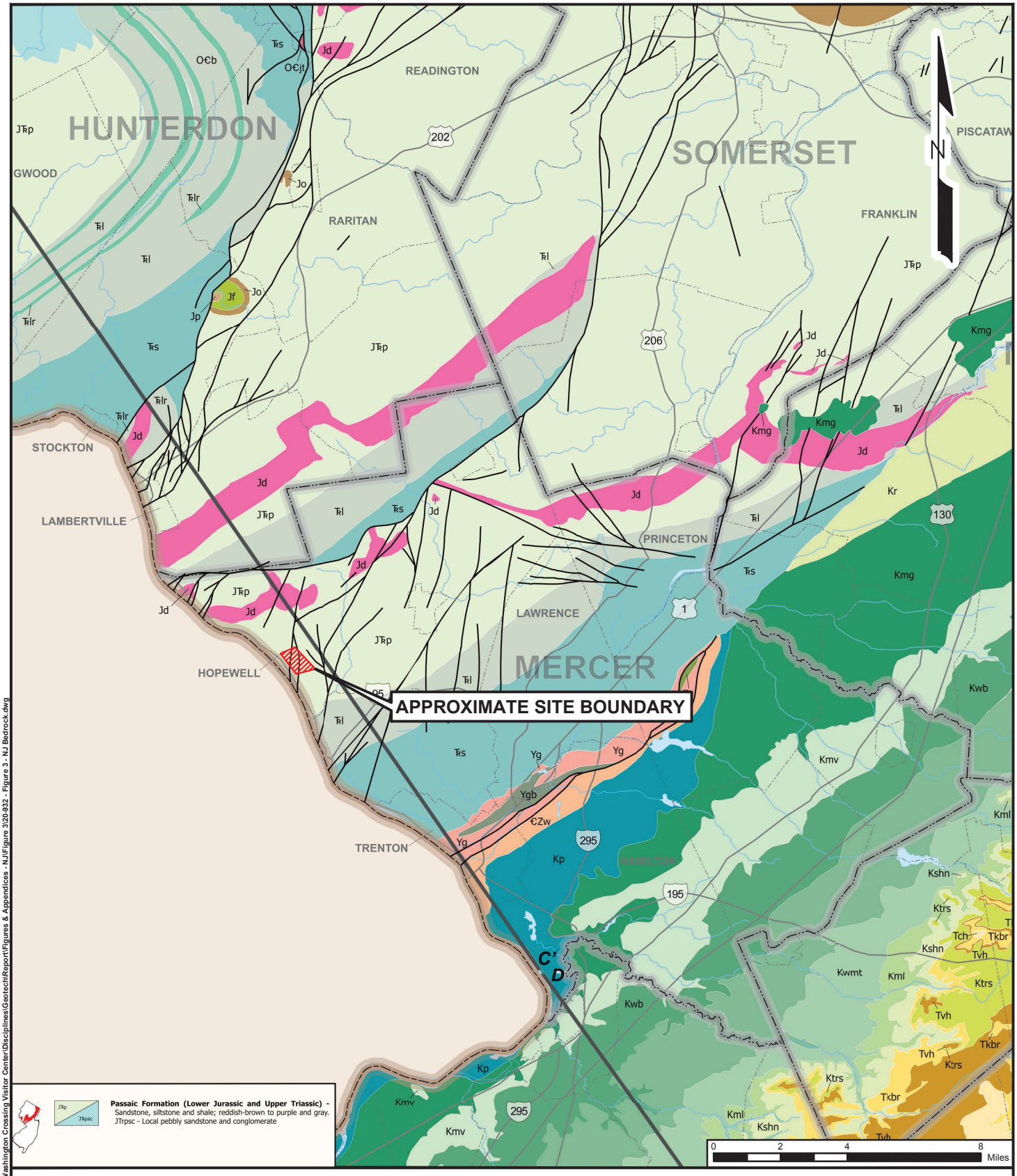
NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
WASHINGTON CROSSING NEW VISITOR CENTER
TITUSVILLE, NEW JERSEY 08560

PROJECT NUMBER: 20-932

SCALE: AS NOTED

DATE: 9-22-2021

2

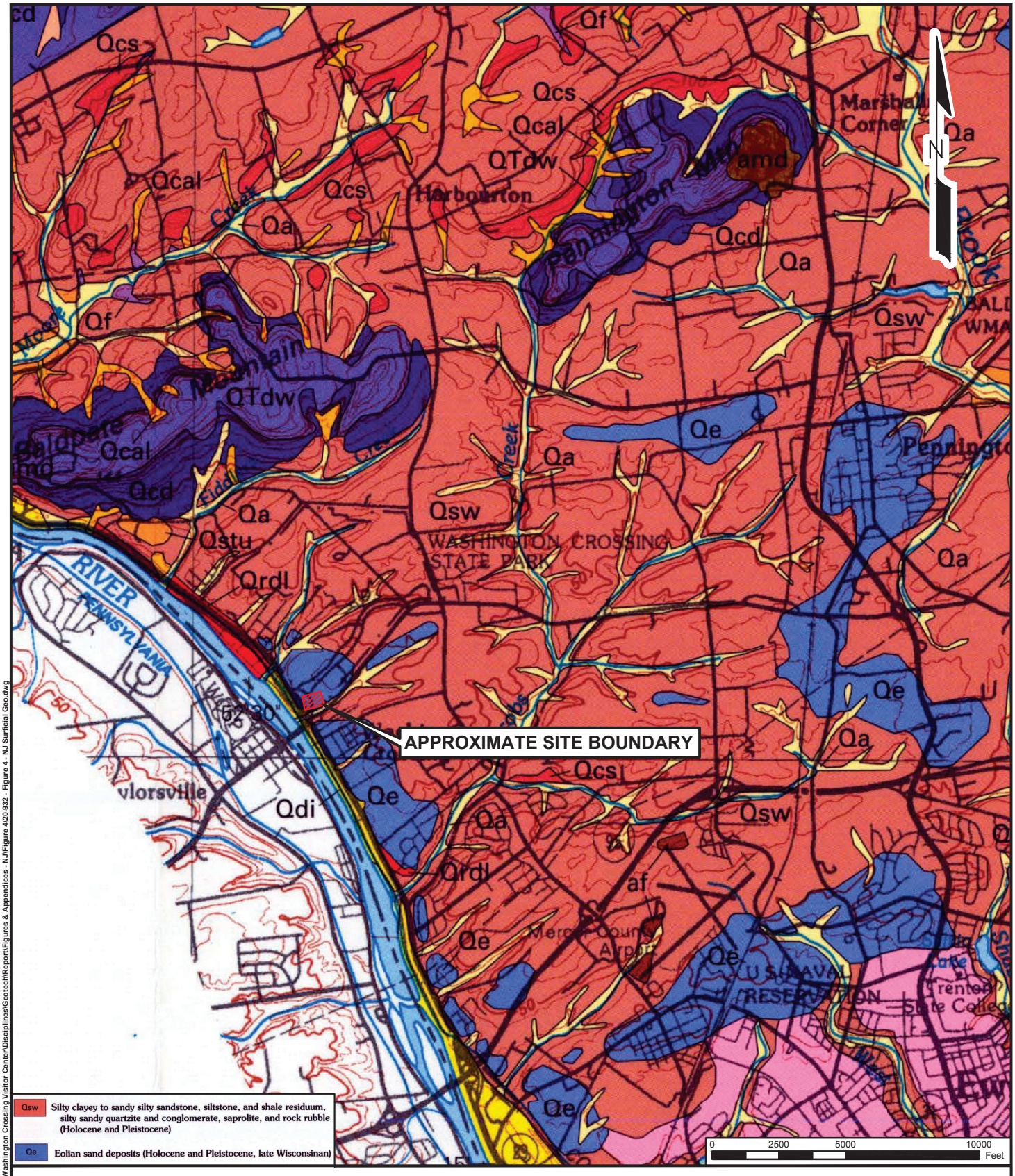


BEDROCK GEOLOGY LOCATION MAP

MATRIXNEWORLD
Engineering Progress
Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
26 Columbia Turnpike
Florham Park, New Jersey 07932
Certified WBE
Tel: 973-240-1800
Fax: 973-240-1818
www.matrixneworld.com

STATE OF NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
WASHINGTON CROSSING STATE PARK NEW VISITOR CENTER
TITUSVILLE, NEW JERSEY 08560

SCALE:	PROJECT NO.:	DATE:	FIGURE NO.:
1" = 4 Miles	20-932	SEPTEMBER 2021	3



SURFICIAL GEOLOGY LOCATION MAP

MATRIXNEWORLD
Engineering Progress
Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
26 Columbia Turnpike
Florham Park, New Jersey 07932
Certified WBE
Tel: 973-240-1800
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WASHINGTON CROSSING STATE PARK NEW VISITOR CENTER
TITUSVILLE, NEW JERSEY 08560

SCALE:	PROJECT NO.:	DATE:	FIGURE NO.:
1" = 5000'	20-932	SEPTEMBER 2021	4

APPENDIX A

SOIL BORING LOGS

LOG NOTATION

Sample Classifications

SS = Split Spoon

NR = No Recovery

NX = Rock Core

U = Shelby Tube

REC = Soil Recovery

RQD = Rock Quality Designation

Sand Classifications

c = Coarse

m = Medium

f = Fine

* = Predominant Grain Size

Soil Properties

WC = Water Content

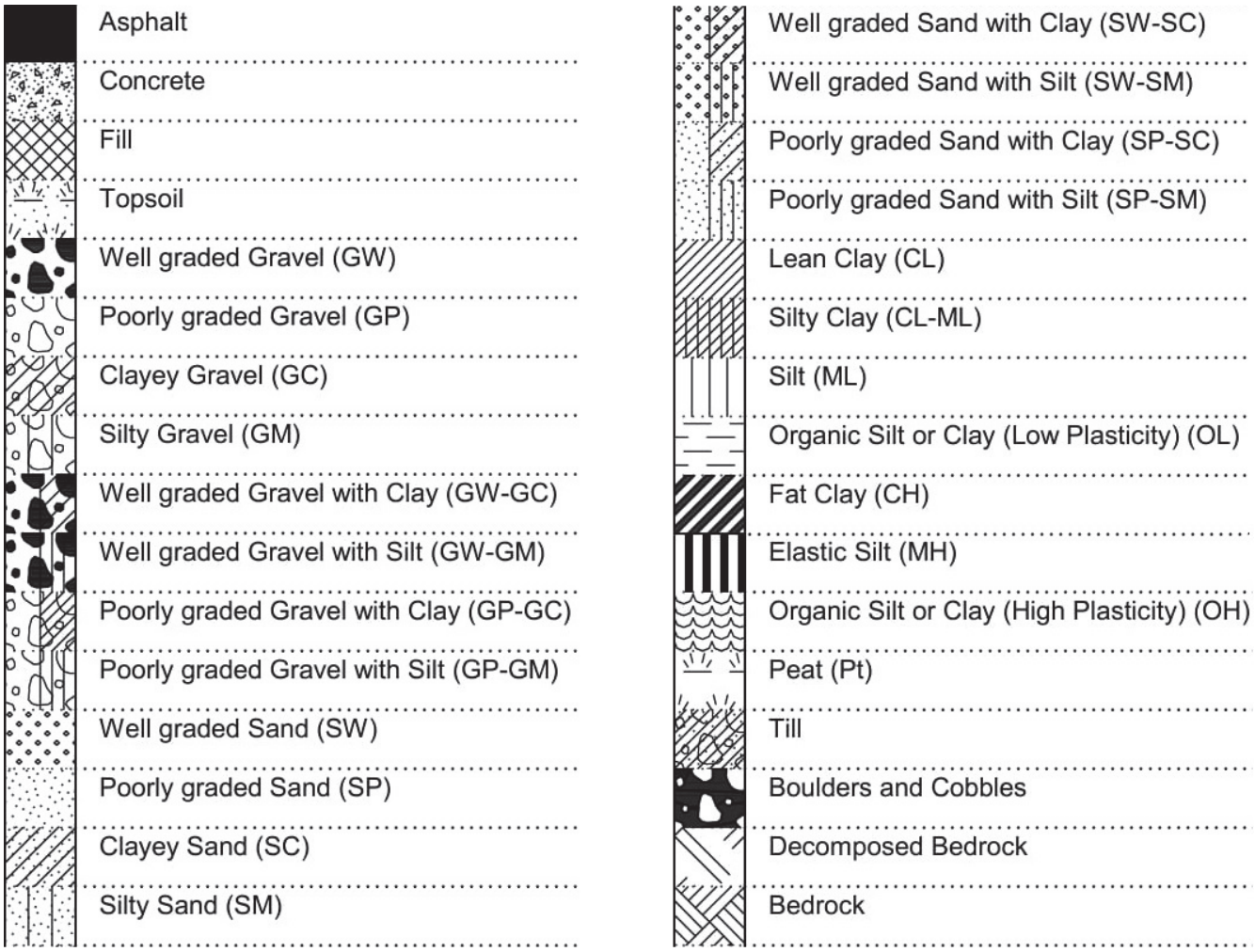
PL = Plastic Limit

LL = Liquid Limit

PI = Plasticity Index

OC = Organic Content

LOG GRAPHICAL LEGEND



MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-1**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**				
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	SAMPLE Type	SAMPLE Depth Feet	SAMPLE Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-1-1-1 (38%)		Topsoil. Brown silty SAND, dry. (SM)	
		2	SS	2-4	1-WOH/12"-12 (50%)		Same as above, dry. (SM)	
5		3	SS	4-6	1-2-1-2 (67%)		Same as above, dry. (SM) WC: 14.0%; Gravel: 0%, Sand: 66%, Fines: 34%; PL: 18, PI: NP	Sieve; Atterberg Limits
		4	SS	6-7.8	16-30-31-60/3" (100%)		4" Same as above, dry. (SM) 17" Decomposed red MUDSTONE, dry.	
				8-8.3	50/3" (0%)		No recovery. Bottom of Borehole @ 8.25 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-2**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**				
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	Type	Depth Feet	Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-1-1-1 (58%)		Topsoil. Brown silty SAND, dry. (SM)	
		2	SS	2-4	1-2-4-4 (71%)		Same as above, dry. (SM)	
5		3	SS	4-6	6-4-4-3 (75%)		Same as above, dry. (SM)	
		4	SS	6-8	2-3-5-8 (67%)		12" Same as above, dry. (SM)	
							4" Decomposed red MUDSTONE, dry.	
		5	SS	8-10	9-13-9-8 (75%)		Same as above, dry.	
10		6	SS	10-11.7	12-6-16-50/1" (61%)		Same as above, dry. WC: 9.3%; Gravel: 35%, Sand: 48%, Fines: 17%	Sieve
15		7	SS	15-16.3	15-20-50/3" (80%)		Same as above, dry.	
							Bottom of Borehole @ 16.25 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

BORING NO.: **B-2**

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-3**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**	**9/13/21**	**10:00 am**	**6 (perched)**	
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	Type	Depth Feet	Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-1-1-1 (54%)		Topsoil. Brown silty SAND, dry. (SM)	
		2	SS	2-4	2-2-5-6 (79%)		Same as above, dry. (SM)	
5		3	SS	4-6	5-6-7-6 (63%)		Same as above, dry. (SM)	
		4	SS	6-8	10-10-7-9 (83%)		4" Same as above, wet. (SM) 16" Decomposed red MUDSTONE, dry.	
		5	SS	8-10	11-18-17-26 (71%)		Same as above, dry.	
10		6	SS	10-12	15-12-10-6 (58%)		Same as above, dry. WC: 7.8%, Gravel: 53%, Sand: 35%, Fines: 12%	Sieve
		7	SS	12-14	6-8-8-16 (50%)		Same as above, dry.	
15								
		8	SS	17-18.5	22-16-50/5.5" (78%)		Same as above, dry.	
							Bottom of Borehole @ 18.5 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

BORING NO.: **B-3**

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-4**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**	**9/13/21**	**9:30 am**	**5.5 (perched)**	
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	SAMPLE Type	SAMPLE Depth Feet	SAMPLE Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-1-1-1 (58%)		Topsoil. Brown SILT, dry. (ML)	
		2	SS	2-4	WOH/18"-1 (50%)		Same as above, dry. (ML)	
5		3	SS	4-6	1-1-2-2 (50%)		Same as above, dry, bottom 4" wet. (ML) WC: 22.6%; Gravel: 0.1%, Sand: 41.9%, Fines: 58%; LL: 21, PL: 20, PI: 1	Sieve; Atterberg Limits
		4	SS	6-8	9-12-19-19 (83%)		Decomposed red MUDSTONE, dry.	
		5	SS	8-10	13-20-35-50 (67%)		Same as above, dry.	
10		6	SS	10-11.5	32-38-50/5" (50%)		Same as above, dry.	
							Bottom of Borehole @ 11.5 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

BORING NO.: **B-4**

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-5**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**				
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	SAMPLE Type	SAMPLE Depth Feet	SAMPLE Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	2-2-2-1 (71%)		Topsoil.	
							Brown SILT, dry. (ML)	
		2	SS	2-4	1-1-2-2 (71%)		Brown SILT, trace f Sand, dry. (ML)	
		3	SS	4-5.9	3-4-18-50/5" (88%)		11" Same as above, dry. (ML)	
5							9" Decomposed red MUDSTONE, dry.	
		4	SS	6-6.3	50/4" (100%)		Same as above, dry.	
							Bottom of Borehole @ 6.33 ft.	

BORING NO.: **B-5**

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-6**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**				
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	Type	Depth Feet	Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-1-1-1 (58%)		Topsoil. Brown SILT, dry. (ML)	
		2	SS	2-4	1-1-2-3 (63%)		Same as above, dry. (ML)	
		3	SS	4-6	5-6-8-17 (92%)		9" Same as above, dry. (ML)	
5							13" Decomposed red MUDSTONE, dry.	
		4	SS	6-8	32-24-38-42 (67%)		Same as above, dry. WC: 14.5%; Gravel: 33%, Sand: 27%, Fines: 40%	Sieve
		5	SS	8-8.5	50/5.5" (83%)		Same as above, dry.	
10				10-10	50/0"		Bottom of Borehole @ 10 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

BORING NO.: **B-6**

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-7**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**				
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	Type	Depth Feet	Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-3-3-3 (79%)		Topsoil. Brown silty SAND with gravel (SM)	
		2	SS	2-4	2-1-2-2 (63%)		Same as above, dry. (SM)	
5		3	SS	4-6	1-2-8-7 (71%)		16" Same as above, dry. (SM) WC: 13.2%; Gravel: 19%, Sand: 54%, Fines: 27%, PL: 17, PI: NP	Sieve; Atterberg Limits
		4	SS	6-6.5	50/5" (17%)		1" Decomposed red MUDSTONE, dry. Same as above, dry.	
				8-8	50/0"		Bottom of Borehole @ 8 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

BORING NO.: **B-7**

MATRIXNEWORLD
Engineering Progress

TEST PIT LOG

TEST PIT NO.: **TP-B1**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/15/2021**

PROJECT LOCATION: **Titusville, NJ 08560** ELEV.: TIME STARTED:

TEST PIT LOCATION: **Potential stormwater basin** DATUM: TIME FINISHED:

CONTRACTOR: **Heritage** GROUNDWATER LEVEL (IN): **Not encountered**

EQUIPMENT: **CAT 308C** OPERATOR: **Chris Sigle** INSPECTOR: **L. Martin**

Depth Inches (Elev)	No.	Depth Inches	Graphic Symbol	Description Of Material	Laboratory Tests
5				Topsoil.	
10				Brown silty SAND (SM)	
85				Reddish brown decomposed MUDSTONE. Silt, cmf Sand, cmf Gravel, and cobble size pieces.	
175				Bottom of Test pit @ 175 in. Test Pit Backfilled.	

TEST PIT INCH 20-932 TEST PIT LOGS 10-26-21.GPJ MATRIX EGS.GDT 11/9/21

MATRIXNEWORLD
Engineering Progress

TEST PIT LOG

TEST PIT NO.: **TP-B2**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/15/2021**

PROJECT LOCATION: **Titusville, NJ 08560** ELEV.: TIME STARTED:

TEST PIT LOCATION: **Potential stormwater basin** DATUM: TIME FINISHED:

CONTRACTOR: **Heritage** GROUNDWATER LEVEL (IN): **Not encountered**

EQUIPMENT: **CAT 308C** OPERATOR: **Chris Sigle** INSPECTOR: **L. Martin**

Depth Inches (Elev)	No.	Depth Inches	Graphic Symbol	Description Of Material	Laboratory Tests
5				Topsoil.	
10				Brown silty SAND (SM)	
15					
20					
25					
30					
35					
40					
45					
50					
55					
60					
65				Permeability rate at 5 feet: 7.88 in/hr.	
70					
75					
80					
85					
90				Reddish brown decomposed MUDSTONE. Silt, cmf Sand, cmf Gravel, and cobble size pieces.	
95					
100					
105					
110					
115					
120					
125					
130					
135					
140					
145					
150					
155					
160					
165					
170					
175					
180					
				Bottom of Test pit @ 180 in. Test Pit Backfilled.	

TEST PIT INCH 20-932 TEST PIT LOGS 10-26-21.GPJ MATRIX EGS.GDT 11/9/21

MATRIXNEWORLD
Engineering Progress

TEST PIT LOG

TEST PIT NO.: **TP-S1**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/15/2021**

PROJECT LOCATION: **Titusville, NJ 08560** ELEV.: TIME STARTED:

TEST PIT LOCATION: **Septic field option 1** DATUM: TIME FINISHED:

CONTRACTOR: **Heritage** GROUNDWATER LEVEL (IN): **125**

EQUIPMENT: **CAT 308C** OPERATOR: **Chris Sigle** INSPECTOR: **L. Martin**

Depth Inches (Elev)	No.	Depth Inches	Graphic Symbol	Description Of Material	Laboratory Tests
5				Topsoil.	
10				Brown silty SAND (SM)	
85				Reddish brown decomposed MUDSTONE. Silt, cmf Sand, cmf Gravel, and cobble size pieces.	
125 ▼				Groundwater pooled at 10 ft 5 in. Bottom of Test pit @ 126 in. Test Pit Backfilled.	

TEST PIT INCH 20-932 TEST PIT LOGS 10-26-21.GPJ MATRIX EGS.GDT 11/9/21

TEST PIT NO.: **TP-S1**

MATRIXNEWORLD
Engineering Progress

TEST PIT LOG

TEST PIT NO.: **TP-S2**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/15/2021**

PROJECT LOCATION: **Titusville, NJ 08560** ELEV.: TIME STARTED:

TEST PIT LOCATION: **Septic field option 1** DATUM: TIME FINISHED:

CONTRACTOR: **Heritage** GROUNDWATER LEVEL (IN): **128**

EQUIPMENT: **CAT 308C** OPERATOR: **Chris Sigle** INSPECTOR: **L. Martin**

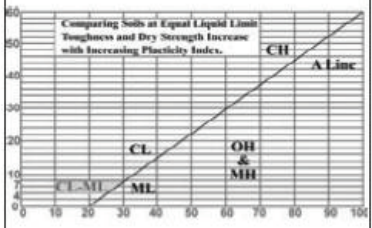
Depth Inches (Elev)	No.	Depth Inches	Graphic Symbol	Description Of Material	Laboratory Tests
5				Topsoil.	
10				Brown silty SAND (SM)	
15					
20					
25					
30					
35					
40				Brown silty SAND (SM)	
45					
50	S-1	48		Sandy Loam Permeability Class Rating: K2 WC: 11.3%, Gravel: 0.2%, Sand: 75%, Silt: 18.8%, Clay: 6%	
55					
60					
65	S-2	60		Sandy Loam Permeability Class Rating: K2 WC: 16.5%, Gravel: 34%, Sand: 40%, Silt: 19%, Clay: 7%	
70					
75				Reddish brown decomposed MUDSTONE. Silt, cmf Sand, cmf Gravel, and cobble size pieces.	
80					
85					
90	S-3	86		Loam Permeability Class Rating: K1 WC: 12.5%, Gravel: 68%, Sand: 17.5%, Silt: 11%, Clay: 3.5%	
95					
100					
105					
110					
115					
120					
125					
130 ▼				Groundwater pooled at 10 ft 8 in.	
				Bottom of Test pit @ 130 in. Test Pit Backfilled.	

TEST PIT INCH 20-932 TEST PIT LOGS 10-26-21.GPJ MATRIX EGS.GDT 11/9/21

TEST PIT NO.: **TP-S2**

APPENDIX B

SOIL CLASSIFICATION TABLES

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES	FIELD IDENTIFICATION PROCEDURES (EXCLUDING PARTICLES LARGER THAN 3 IN. AND BASING FRACTIONS ON ESTIMATED WEIGHTS)			INFORMATION REQUIRED FOR DESCRIBING SOILS	LABORATORY CLASSIFICATION CRITERIA
1	2		3	4	5			6	7
Coarse-grained Soils More than half of material is larger than No. 200 sieve size. The No. 200 sieve size is about the smallest visible to the naked eye.	Gravels More than half of coarse fraction is larger than No. 4 sieve size. (For visual classification, the 1/4-in. size may be used as equivalent to the No. 4 sieve size.)	Clean Gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixture, little or no fines.	Wide range in grain size and substantial amounts of all intermediate particle sizes.			For undisturbed soils add information on stratification, degree of compactness, cementation, moisture condition, and drainage characteristics.	Use grain-size curve in identifying the fractions as given under field identification. Determine percentage of gravel and sand from grain-size curve. Depending on percentage of fine (fraction smaller than No. 200 sieve size) coarse-grained soils are classified as follows: Less than 5% GW, GP, SW, SP. More than 12% GM, GC, SM, SC. 5% to 12% Borderline cases requiring use of dual symbols. $C_u = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			GP	Poorly graded gravels or gravel-sand mixture, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.				Not meeting all gradation requirements for GW
		Gravels with Fines (Appreciable amount of fines)	GM	Silty gravels, gravel and silt mixtures.	Nonplastic fines or fines with low plasticity (for identification procedures see ML below).			Give typical name; indicate approximate percentages of sand and gravel, maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbol in parentheses.	Atterberg limits below "A" line or P1 less than 4
			GC	Clayey gravels, gravel and clay mixtures.	Plastic fines (for identification procedures see CL below).				Atterberg limits above "A" line with P1 greater than 7
									Above "A" line with P1 between 4 and 7 are borderline cases requiring use of dual symbols.
	Sands More than half of coarse fraction is smaller than No 4 sieve size.	Clean Sand (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.	Wide range in grain size and substantial amounts of all intermediate particle sizes.				$Cu = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			SP	Poorly graded sands or gravelly sands, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.			Example: Silty sand, gravelly; about 20% hard, angular gravel particles 1/2-in. maximum size; rounded and subangular sand grains, coarse to fine; about 15% nonplastic fines with low dry strength; well compacted and moist in place; alluvial sand; (SM).	Not meeting all gradation requirements for SW
		Sands with Fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.	Nonplastic fines or fines with low plasticity (for identification procedures see ML below).				Atterberg limits above "A" line or P1 less than 4
			SC	Clayey sands, sand-clay mixtures.	Plastic fines (for identification procedures see CL below).				Atterberg limits above "A" line with Pl greater than 7
									Limits plotting in hatched zone with P1 between 4 and 7 are borderline cases requiring use of dual symbols.
					Identification Procedure on Fraction Smaller than No. 40 Sieve Size.				
					Dry Strength (Crushing Characteristics)	Dilatancy (Reaction to shaking)	Toughness (Consistency near PL)		
Fine-grained Soils More than half of material is smaller than No. 200 sieve size.	Silts and Clays Liquid limit is less than 50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.	None to slight	Quick to slow	None	For undisturbed soils add information on structure, stratification, consistency in undisturbed and remolded states, moisture and drainage conditions	Plasticity Index — LIQUID LIMIT PLASTICITY CHART For laboratory classification of fine-grained soils 
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Medium to high	None to very slow	Medium		
	Silts and Clays Liquid limit is greater than 50		OL	Organic silts and organic silty clays of low plasticity.	Slight to medium	Slow	Slight	Give typical name; indicate degree and character of plasticity; amount and maximum size of coarse grains; color in wet condition; odor, if any; local or geologic name and other pertinent descriptive information; and symbol in parentheses.	
			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	Slight to medium	Slow to none	Slight to medium		
			CH	Inorganic clays of high plasticity, fat clays.	High to very high	None	High		
			OH	Organic clays of medium to high plasticity, organic silts.	Medium to high	None to very slow	Slight to medium	Example: Clayey silt, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (ML)	
Highly Organic Soils			Pt	Peat and other highly organic soils.	Readily identified by color, odor, spongy feel and frequently by fibrous texture				

1. Boundary classifications: Soils possessing characteristics of two groups are designed by combinations of group symbols. For example GM-GC, well-graded gravel-sand mixture with clay binder.
2. All sieve sizes on this chart are U.S. standard.
3. Adopted by Corps of Engineers and Bureau of Reclamation, January 1952.

032058C

BURMISTER SOIL IDENTIFICATION METHOD

BURMISTER SOIL IDENTIFICATION METHOD

1. SOIL MATERIAL — Composition, Gradation, and Plasticity Characteristics

a) Soil Components and Soil Fractions

Sieve	3"	1"	3/8"	No. 10	No. 30	No. 60	No. 200	
				2 mm			0.076 mm	0.02 mm
Granular Component Fractions	GRAVEL			SAND			SILT	
	coarse	medium	fine	coarse	medium	fine	coarse	fine
Clay Soil Components							CLAY-SOIL Defined and Named on a Plasticity Basis	

b) Identifying Terms for Granular Soils
Composition and Proportion Terms for Components

Component		Proportion Terms	Defining Range of Percentages
Principal Components- GRAVEL, SAND, SILT (all Uppercase)			50% or more
Minor Components-	Gravel	and	35 to 50%
	Sand	some	20 to 35%
	Silt	little	10 to 20%
		trace	1 to 10%

Gradation Terms for Granular Soils		ORGANIC SOILS
coarse to fine	all fractions more than 10%	Plasticity Basis, as
coarse to medium	fine less than 10%	
medium to fine	coarse less than 10%	Organic SILT, H. PI
medium	coarse and fine less than 10%	
fine	coarse and medium less than 10%	Organic SILT, L. PI

PLUS or MINUS signs used to indicate upper or lower limits.

c) Identifying Terms for CLAY SOILS. Plasticity Basis for Combined Silt and Clay Components, Expressing the Relative Dominance of Clay

Overall Plasticity	Plasticity Index	Principal Component	Minor Component
Non-Plastic	0	SILT	Silt
Slight	1 to 5	Clayey SILT	Clayey Silt
Low	5 to 10	SILT & CLAY	Silt & Clay
Medium	10 to 20	CLAY & SILT	Clay & Silt
High	20 to 40	Silty CLAY	
Very High	more than 40	CLAY	

Example: Soil 60% coarse to fine Sand, 25% medium to fine Gravel, 15% Clayey Silt and color-brown.
Identification: Br. coarse to fine SAND, some medium to fine Gravel, little Clayey Silt.

References: 1) D. M. Burmister, "Principles and Techniques of Soil Identification" 29th Highway Research Board Proceedings, 1949.
2) "Identification and Classification of Soils – An appraisal and Statement of Principles", ASTM Special Technical Publication No. 113, 1951.

Field Classification of Soil Using the USCS

Apparent Density of Coarse-Grained Soils

SPT N-Value (corrected)	Apparent Density
0 - 4	Very loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
> 50	Very Dense

Consistency of Fine-Grained Soils

SPT N-Value (uncorrected)	Consistency	Compressive Strength (ksf)	Results of Manual Manipulation
< 2	Very Soft	< 0.5	Specimen (height = twice the diameter) sags under its own weight; extrudes between fingers when squeezed
3 - 4	Soft	> 0.5 - 1.0	Speciment can be pinched in to between the thumb and forefinger; remolded by light finger pressure
5 - 8	Medium stiff	> 1.0 - 2.0	Can be imprinted easily with fingers; remolded by strong finger pressure
9 - 15	Stiff	> 2.0 - 4.0	Can be imprinted with considerable pressure from fingers or indented by thumbnail
16 - 30	Very stiff	> 4.0 - 8.0	Can be barely imprinted by pressure from the fingers or indented by thumbnail
> 30	Hard	> 8.0	Cannot be imprinted by fingers or difficult to indent by thumbnail

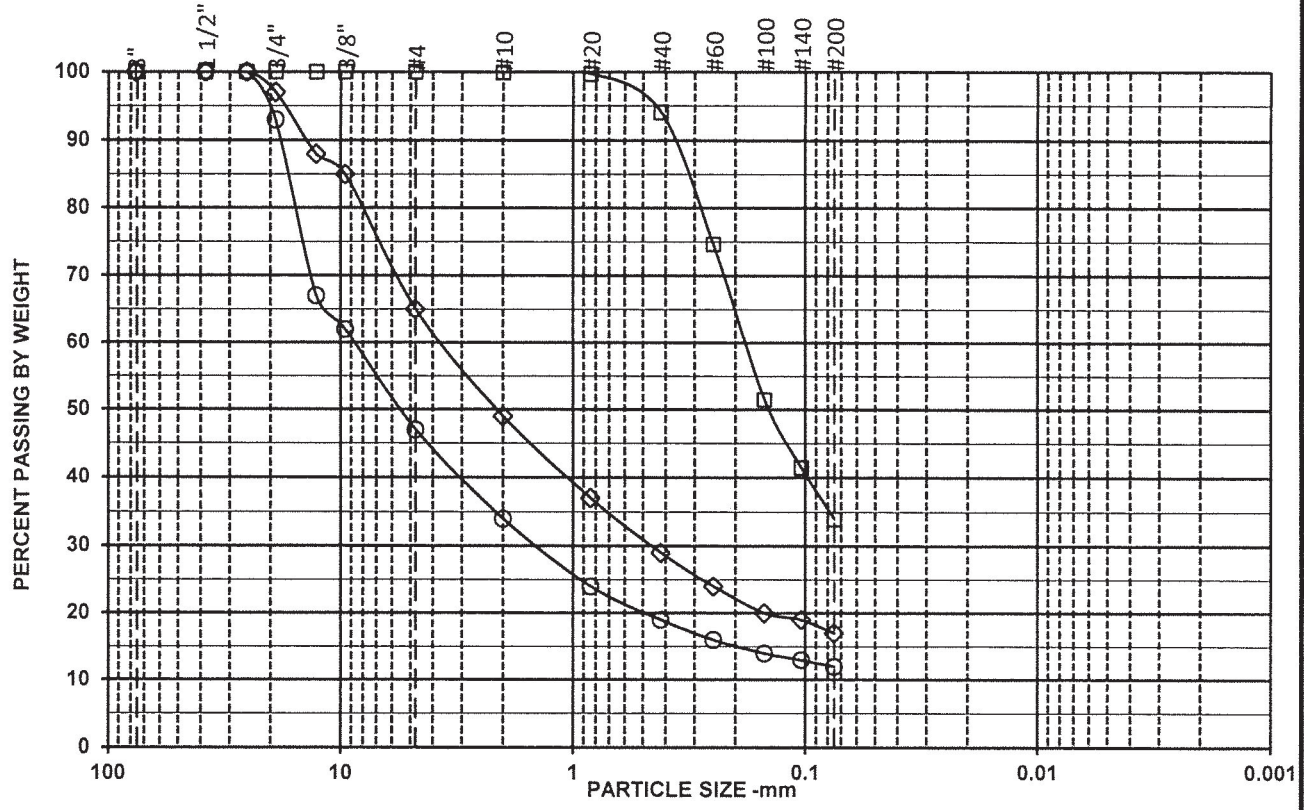
APPENDIX C

RESULTS OF GEOTECHNICAL LABORATORY TESTING

Matrix New World Engineering, P.C. #20-932
DPMC Washington Crossing Visitor Center
LABORATORY TESTING DATA SUMMARY

BORING NO.	SAMPLE NO.	REPLICATE	DEPTH (ft)	IDENTIFICATION TESTS									REMARKS
				WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDROMETER % MINUS 2 μm (%)	TEXTURAL CLASSIFICATION	PERMEABILITY CLASS RATING	
B-1	S-3		4-6	14.0	-	18	NP	SM	34				
B-2	S-6		10-12	9.3				SC	17				
B-3	S-6		10-12	7.8				GP-GM	12				
B-4	S-3		4-6	22.6	21	20	1	ML	58				
B-6	S-4		6-8	14.5				GC	40				
B-7	S-3		4-6	13.2	-	17	NP	SM	27				
TP-2	S-1	A	4	11.3				SM	40.3	5	Sandy Loam	K2	
TP-2	S-1	B	4	11.9				SM	39.6	7	Sandy Loam	K2	
TP-2	S-2	A	5	16.3				SM	36	7	Sandy Loam	K2	
TP-2	S-2	B	5	16.6				SM	36	7	Sandy Loam	K2	
TP-2	S-3	A	7.2	12.8				GM	21	4	Loam	K1	
TP-2	S-3	B	7.2	12.1				GM	17	3	Loam	K1	

Note: (1) USCS symbol based on visual observation and Sieve and Atterberg limits reported.



Open Symbols: Sieve analysis by ASTM D6913
Filled symbols: Hydrometer analysis by ASTM D7928 corrected for complete sample

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	14.0	-	18	NP	SM		Brown, Silty sand	09/30/21
◇	9.3				SC		Dark reddish brown, Clayey sand with gravel shale noted, Insufficient sample size	09/30/21
○	7.8				GP-GM		Dark reddish brown, Poorly graded gravel with silt and sand shale noted, Insufficient sample size	09/30/21

Matrix New World Engineering, P.C. #20-932

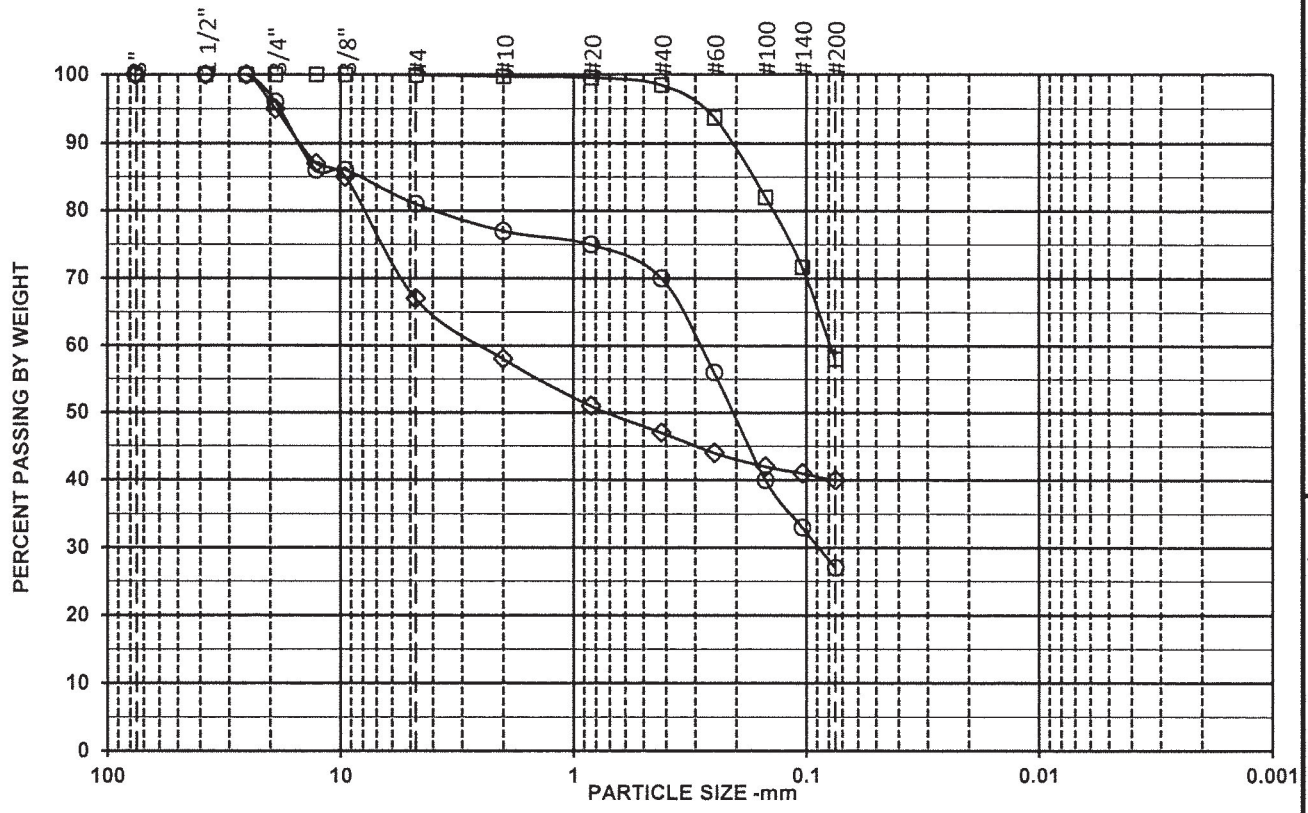
TerraSense #21005948A

DPMC Washington Crossing Visitor Center

Symbol	□	◇	○
Boring	B-1	B-2	B-3
Sample	S-3	S-6	S-6
Depth	4-6	10-12	10-12
% +3"	0	0	0
% Gravel	0	35	53
% SAND	66	48	35
%C SAND	0.1	16	13
%M SAND	5.8	20	15
%F SAND	60.1	12	7
% FINES	34	17	12
D_{100} (mm)	4.75	25.4	25.4
D_{60} (mm)	0.18	3.62	8.68
D_{30} (mm)		0.46	1.4
D_{10} (mm)			
Cc			
Cu			

Sieve Size/ID #	Percent Finer Data		
6"	100.0	100	100
4"	100.0	100	100
3"	100.0	100	100
1 1/2"	100.0	100	100
1"	100.0	100	100
3/4"	100.0	97	93
1/2"	100.0	88	67
3/8"	100.0	85	62
#4	100.0	65	47
#10	99.9	49	34
#20	99.7	37	24
#40	94.1	29	19
#60	74.7	24	16
#100	51.5	20	14
#140	41.5	19	13
#200	34.0	17	12
5μ m			
2μ m			
1μ m			

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928



Open Symbols: Sieve analysis by ASTM D6913
Filled symbols: Hydrometer analysis by ASTM D7928 corrected for complete sample

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	22.6	21	20	1	ML		Brown, Sandy silt	09/30/21
◇	14.5				GC		Dark reddish brown, Clayey gravel with sand shale noted, Insufficient sample size	09/30/21
○	13.2		17	NP	SM		Brown, Silty sand with gravel shale noted, Insufficient sample size	09/30/21

Matrix New World Engineering, P.C. #20-932

TerraSense #21005948A

DPMC Washington Crossing Visitor Center

Symbol	□	◇	○
Boring	B-4	B-6	B-7
Sample	S-3	S-4	S-3
Depth	4-6	6-8	4-6
% +3"	0	0	0
% Gravel	0.1	33	19
% SAND	41.9	27	54
%C SAND	0.2	9	4
%M SAND	1.3	11	7
%F SAND	40.4	7	43
% FINES	58	40	27
D_{100} (mm)	9.53	25.4	25.4
D_{60} (mm)	0.0787	2.42	0.289
D_{30} (mm)			0.088
D_{10} (mm)			
Cc			
Cu			

Sieve Size/ID #	Percent Finer Data		
6"	100.0	100	100
4"	100.0	100	100
3"	100.0	100	100
1 1/2"	100.0	100	100
1"	100.0	100	100
3/4"	100.0	95	96
1/2"	100.0	87	86
3/8"	100.0	85	86
#4	99.9	67	81
#10	99.7	58	77
#20	99.5	51	75
#40	98.4	47	70
#60	93.7	44	56
#100	82.0	42	40
#140	71.7	41	33
#200 5μ m	58.0	40	27
2μ m			
1μ m			

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Form 3c. Soil Permeability Class Rating Data

1. Project Number 20-932 Replicate (Letter) A

2. Sample Depth 4 Soil Pit/Boring Number TP-2 Sample S-1

3. Coarse Fragment Content:

Total Weight of Sample, WT, grams	90.44
Weight of Material Retained on 2mm sieve, WCF, grams	0.18
Wt. % Coarse Fragments (W.C.F. / W.T. x 100)	0.2

4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.:	39.24
5. Hydrometer Calibration, Rc:	6.25
6. Hydrometer Reading -- 40 seconds, grams, R1:	18.25
Temperature of suspension. °F	71
7. Corrected Hydrometer Reading, grams, R1':	12.6
8. Hydrometer Reading -- 2 hours, grams, R2:	8.962
Temperature of suspension. °F	70
9. Corrected Hydrometer Reading, grams, R2':	3.1
10. % Sand = (Wt. - R1')/Wt. x 100 =	68%
11. % Clay = R2'/Wt. x 100 =	8%

12. Sieve Analysis:

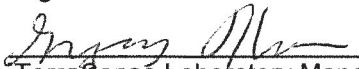
a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction	29.57
b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams	23.06
c. % Fine Plus Very Fine Sand (b/a)	78%

13. Soil Morphology (Natural Soil Samples Only):
Structure of Soil Horizon Tested
Consistence of Soil Horizon Tested: Dry: Moist:

14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples) K2

15. I hereby certify that the information furnished on Form 3c of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-A et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator — Date



10/14/2021

TerraSense Laboratory Manager, Totowa, NJ

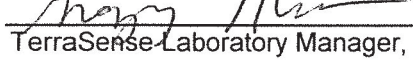
Signature of Professional Engineer — License #

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Form 3c. Soil Permeability Class Rating Data

1. Project Number 20-932 Replicate (Letter) B
2. Sample Depth 4-Jan Soil Pit/Boring Number TP-2 Sample S-1
3. Coarse Fragment Content:
   - Total Weight of Sample, WT, grams: 91.68
   - Weight of Material Retained on 2mm sieve, WCF, grams: 0.18
   - Wt. % Coarse Fragments (W.C.F. / W.T. x 100): 0.2
4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.: 39.82
5. Hydrometer Calibration, Rc: 6.25
6. Hydrometer Reading -- 40 seconds, grams, R1: 18.25
   - Temperature of suspension. °F: 71
7. Corrected Hydrometer Reading, grams, R1': 12.6
8. Hydrometer Reading -- 2 hours, grams, R2: 9.462
   - Temperature of suspension. °F: 70
9. Corrected Hydrometer Reading, grams, R2': 3.6
10. % Sand = (Wt. - R1')/Wt. x 100 = 68%
11. % Clay = R2'/Wt. x 100 = 9%
12. Sieve Analysis:
    - a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction: 29.85
    - b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams: 22.76
    - c. % Fine Plus Very Fine Sand (b/a): 76%
13. Soil Morphology (Natural Soil Samples Only):
    - Structure of Soil Horizon Tested
    - Consistence of Soil Horizon Tested: Dry: Moist:
14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples): K2
15. I hereby certify that the information furnished on Form 3c of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-A et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

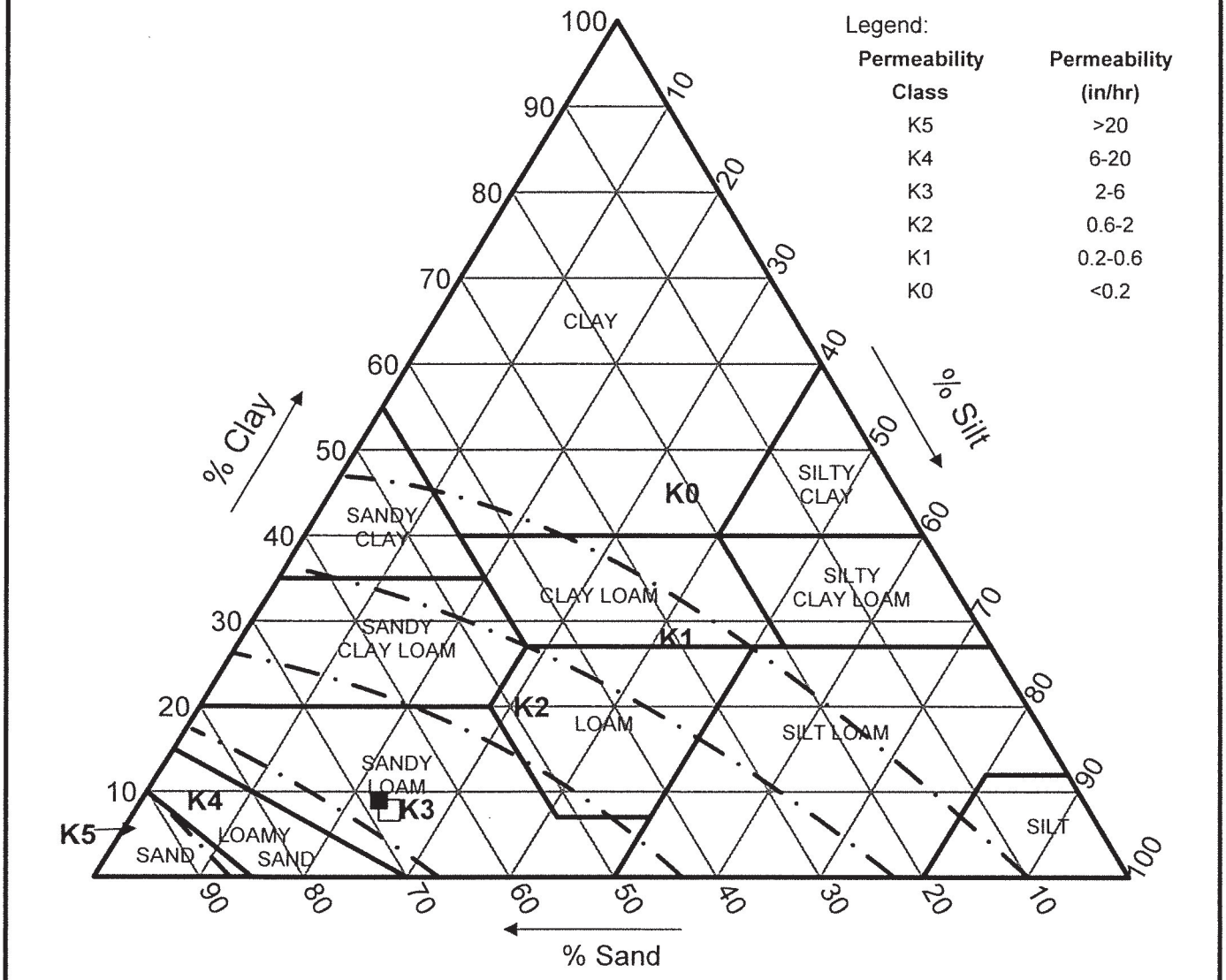
Signature of Soil Evaluator — Date



10/14/2021

TerraSense Laboratory Manager, Totowa, NJ

Signature of Professional Engineer — License #



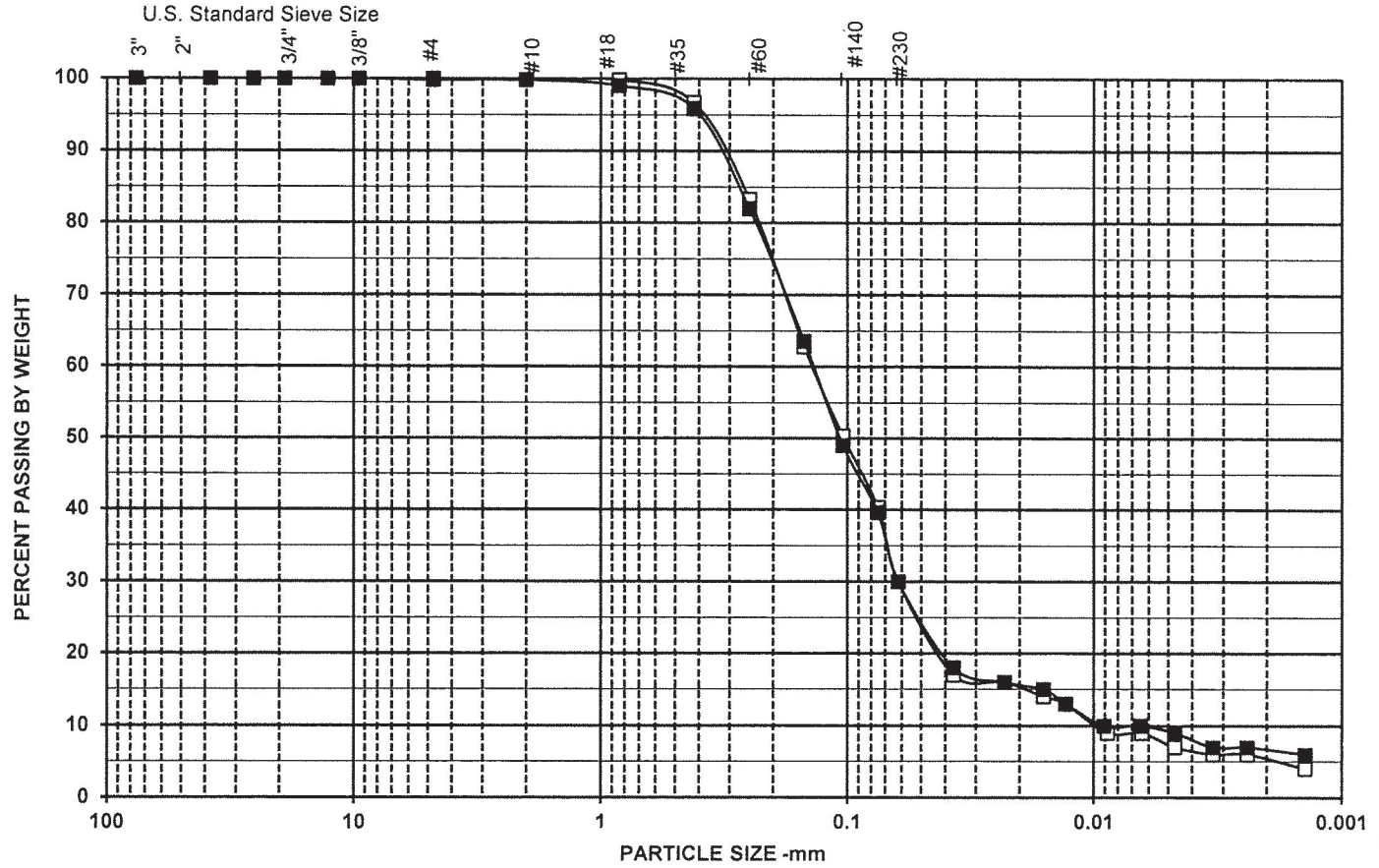
Symbol	Boring Sample	REPLICATE	Normalized Values % Sand	% Clay	% Silt	Permeability Class Rating measured	corrected*	USDA Textural Classification
□	TP-2 S-1	A	67.8	7.8	24.4	K3	K2	Sandy Loam
■	TP-2 S-1	B	68.2	9.0	22.8	K3	K2	Sandy Loam

*as corrected for very fine sand component

Matrix New World Engineering, P.C. Project # 20-932	**DPMC Washington Crossing Visitor Center Mercer County Titusville, NJ**	**Soil Permeability / Textural Triangle by Permeability Class Rating Test**
TerraSense Project # 21005948A		

USDA CLASSIFICATION	GRAVEL	SAND					SILT	CLAY
		VC	C	M	F	VF		

USCS CLASSIFICATION	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	FINE	



Symbol	□	■
Boring	TP-2	TP-2
Sample	S-1	S-1
Replicate	A	B
Depth	4	4
% +3"		
% Gravel	0.2	0.2
% SAND	75.2	74.8
% V.C.Sand		0.4
% C.Sand	1.6	2.1
% M.Sand	14.9	15.3
% F.Sand	33	33
% V.F.Sand	25.7	24
% SILT	19.3	18.3
%CLAY	5.3	6.7
w (%)	11.3	11.9

Particle Size	PERCENT FINER	
(Sieve #)	□	■
4"	100.0	100.0
3"	100.0	100.0
1 1/2"	100.0	100.0
3/4"	100.0	100.0
3/8"	100.0	100.0
#4	100.0	99.8
#10	99.8	99.8
#20	99.8	99.0
#40	96.7	95.9
#60	83.3	82.0
#100	62.8	63.6
#200	40.3	39.6

PLOT SYMBOL	USCS GROUP SYMBOL	USDA CLASSIFICATION	DESCRIPTION AND REMARKS
□	SM	Sandy Loam	Brown, Silty sand
■	SM	Sandy Loam	Brown, Silty sand

PARTICLE SIZE DISTRIBUTION

Matrix New World Engineering, P.C.

DPMC Washington Crossing Visitor

Project No.	
21005948A	October 2021

TerraSense

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

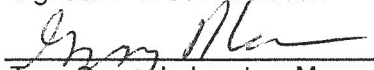
Form 3c. Soil Permeability Class Rating Data

1. Project Number	20-932		Replicate (Letter)	A	
2. Sample Depth	5	Soil Pit/Boring Number	TP-2	Sample	S-2

3. Coarse Fragment Content:	
Total Weight of Sample, WT, grams	528.82
Weight of Material Retained on 2mm sieve, WCF, grams	190.38
Wt. % Coarse Fragments (W.C.F. / W.T. x 100)	36.0
4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.:	39.56
5. Hydrometer Calibration, Rc:	6.25
6. Hydrometer Reading -- 40 seconds, grams, R1:	23.75
Temperature of suspension. °F	71
7. Corrected Hydrometer Reading, grams, R1':	18.1
8. Hydrometer Reading -- 2 hours, grams, R2:	11.962
Temperature of suspension. °F	70
9. Corrected Hydrometer Reading, grams, R2':	6.1
10. % Sand = (Wt. - R1')/Wt. x 100 =	54%
11. % Clay = R2'/Wt. x 100 =	15%
12. Sieve Analysis:	
a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction	24.11
b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams	17.94
c. % Fine Plus Very Fine Sand (b/a)	74%
13. Soil Morphology (Natural Soil Samples Only):	
Structure of Soil Horizon Tested	
Consistence of Soil Horizon Tested: Dry:	Moist:
14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples)	K2

15. I hereby certify that the information furnished on Form 3c of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-A et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator



TerraSense Laboratory Manager, Totowa, NJ

Date: 10/14/2021

Signature of Professional Engineer

License #

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Form 3c. Soil Permeability Class Rating Data

1. Project Number	20-932		Replicate (Letter)	B	
2. Sample Depth	5	Soil Pit/Boring Number	TP-2	Sample	S-2

3. Coarse Fragment Content:	
Total Weight of Sample, WT, grams	624.00
Weight of Material Retained on 2mm sieve, WCF, grams	199.68
Wt. % Coarse Fragments (W.C.F. / W.T. x 100)	32.0
4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.:	39.17
5. Hydrometer Calibration, Rc:	6.25
6. Hydrometer Reading -- 40 seconds, grams, R1:	23.75
Temperature of suspension. °F	71
7. Corrected Hydrometer Reading, grams, R1':	18.1
8. Hydrometer Reading -- 2 hours, grams, R2:	11.962
Temperature of suspension. °F	70
9. Corrected Hydrometer Reading, grams, R2':	6.1
10. % Sand = (Wt. - R1')/Wt. x 100 =	54%
11. % Clay = R2'/Wt. x 100 =	16%
12. Sieve Analysis:	
a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction	23.62
b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams	16.56
c. % Fine Plus Very Fine Sand (b/a)	70%

13. Soil Morphology (Natural Soil Samples Only):
Structure of Soil Horizon Tested
Consistence of Soil Horizon Tested: Dry: Moist:

14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples) K2

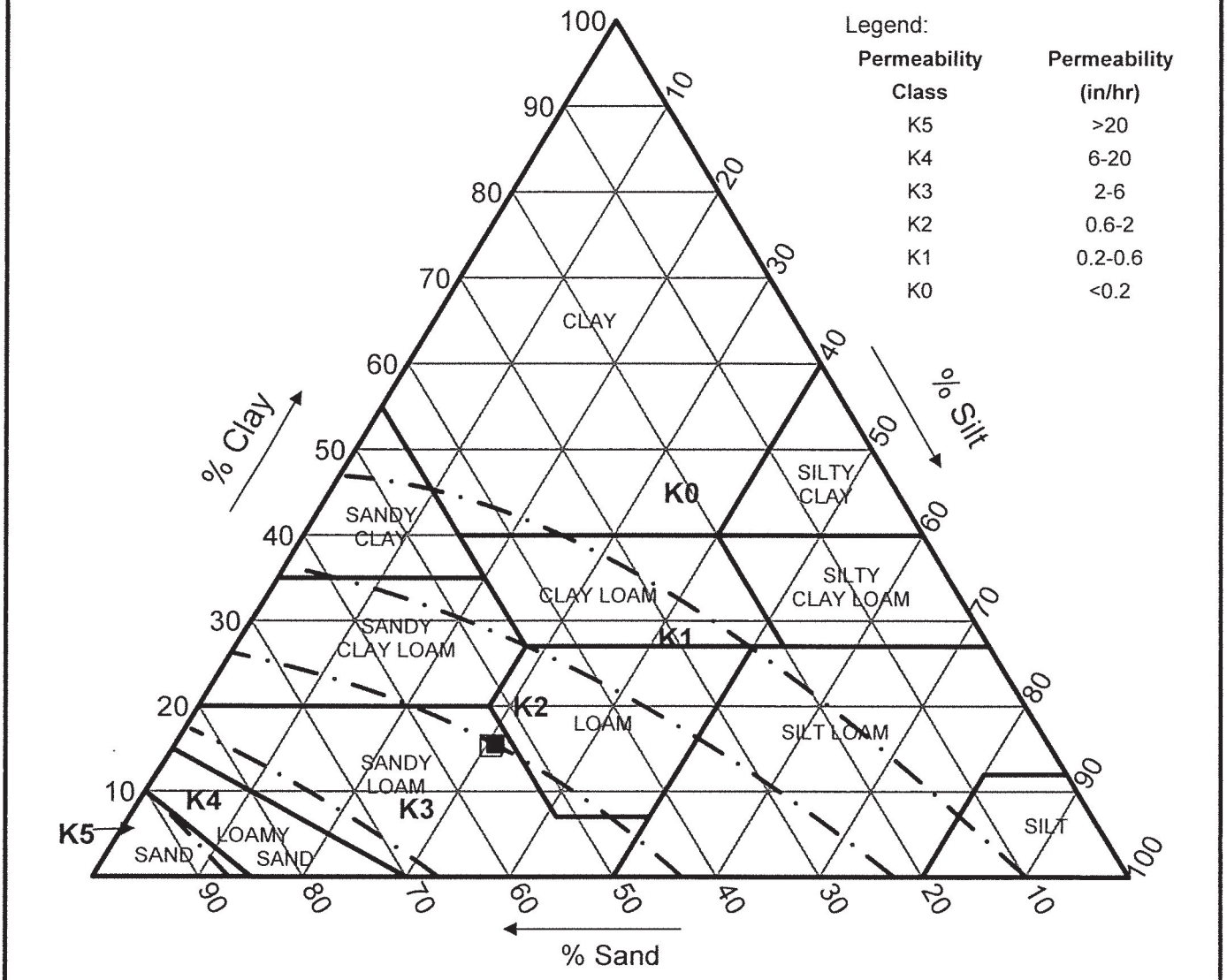
15. I hereby certify that the information furnished on Form 3c of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-A et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator — Date

10/14/2021

TerraSense Laboratory Manager, Totowa, NJ

Signature of Professional Engineer — License #



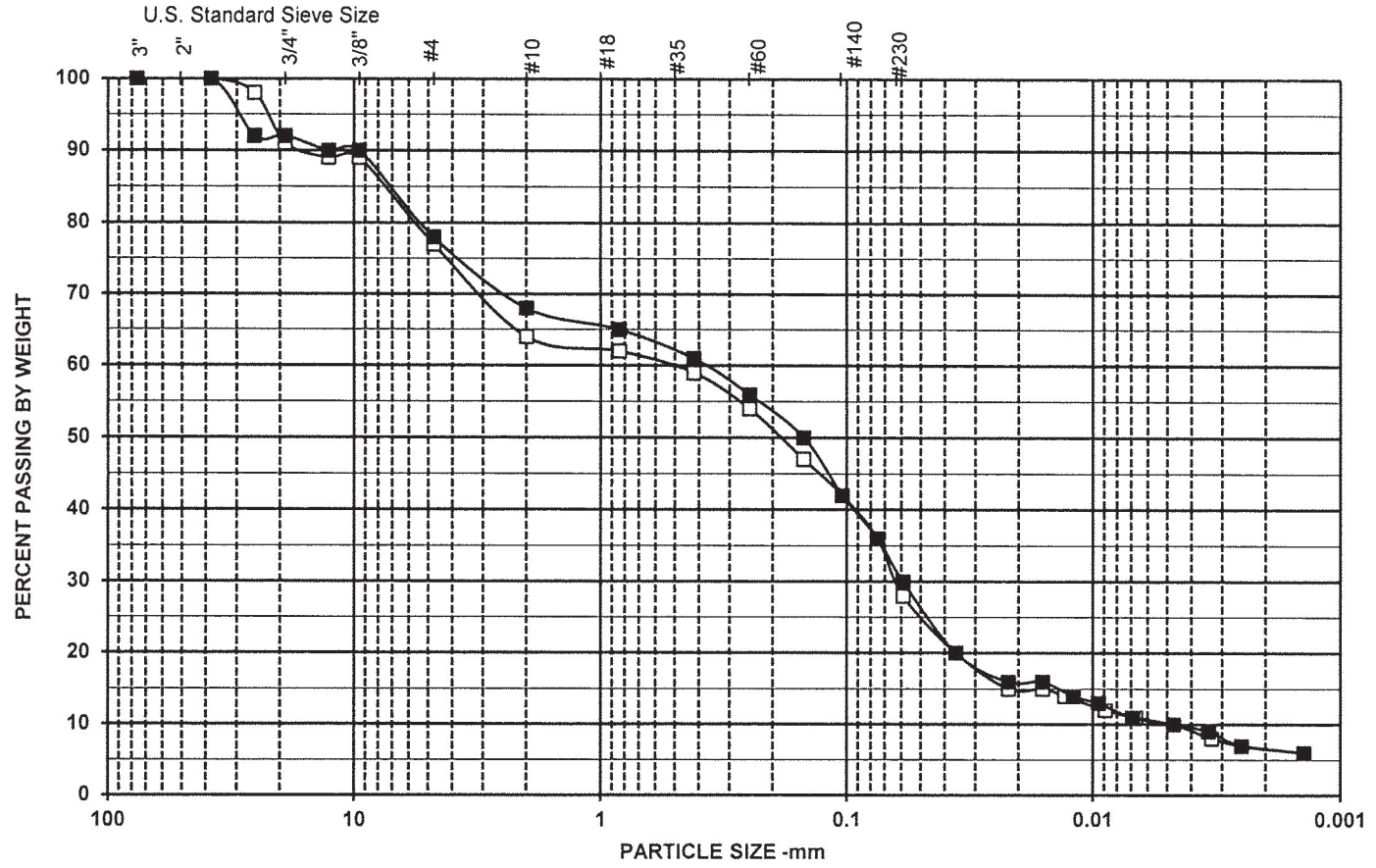
Symbol	Boring Sample	REPLICATE	Normalized Values % Sand	% Clay	% Silt	Permeability Class Rating measured	corrected*	USDA Textural Classification
□	TP-2 S-2	A	54.1	15.3	30.5	K3	K2	Sandy Loam
■	TP-2 S-2	B	53.7	15.5	30.8	K3	K2	Sandy Loam

*as corrected for very fine sand component

Matrix New World Engineering, P.C. Project # 20-932	**Mercer County Titusville, NJ DPMC Washington Crossing Visitor Center**	**Soil Permeability / Textural Triangle by Permeability Class Rating Test**
TerraSense Project # 21005948A		

USDA CLASSIFICATION	GRAVEL	SAND					SILT	CLAY
		VC	C	M	F	VF		

USCS CLASSIFICATION	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	FINE	



Symbol	□	■
Boring	TP-2	TP-2
Sample	S-2	S-2
Replicate	A	B
Depth	5	5
% +3"		
% Gravel	36	32
% SAND	39	41
% V.C.Sand	3	3
% C.Sand	1	3
% M.Sand	6	6
% F.Sand	12	14
% V.F.Sand	17	15
% SILT	18	20
%CLAY	7	7
w (%)	16.3	16.6

Particle Size	PERCENT FINER	
(Sieve #)	□	■
4"	100	100
3"	100	100
1 1/2"	100	100
3/4"	91	92
3/8"	89	90
#4	77	78
#10	64	68
#20	62	65
#40	59	61
#60	54	56
#100	47	50
#200	36	36

PLOT SYMBOL	USCS GROUP SYMBOL	USDA CLASSIFICATION	DESCRIPTION AND REMARKS
□	SM	Sandy Loam	Brown, Silty sand with gravel
■	SM	Sandy Loam	Brown, Silty sand with gravel

PARTICLE SIZE DISTRIBUTION

Matrix New World Engineering, P.C.

DPMC Washington Crossing Visitor

Project No.	
21005948A	October 2021

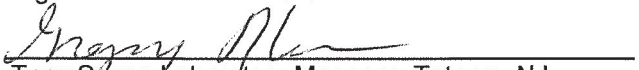
TerraSense

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Form 3c. Soil Permeability Class Rating Data

1. Project Number 20-932 Replicate (Letter) A
2. Sample Depth 7.2 Soil Pit/Boring Number TP-2 Sample S-3
3. Coarse Fragment Content:
   - Total Weight of Sample, WT, grams: 578.59
   - Weight of Material Retained on 2mm sieve, WCF, grams: 376.08
   - Wt. % Coarse Fragments (W.C.F. / W.T. x 100): 65.0
4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.: 39.24
5. Hydrometer Calibration, Rc: 6.25
6. Hydrometer Reading -- 40 seconds, grams, R1: 26
   Temperature of suspension. °F: 71
7. Corrected Hydrometer Reading, grams, R1': 20.4
8. Hydrometer Reading -- 2 hours, grams, R2: 13.212
   Temperature of suspension. °F: 70
9. Corrected Hydrometer Reading, grams, R2': 7.3
10. % Sand = (Wt. - R1')/Wt. x 100 = 48%
11. % Clay = R2'/Wt. x 100 = 19%
12. Sieve Analysis:
    a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction: 21.30
    b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams: 14.68
    c. % Fine Plus Very Fine Sand (b/a): 69%
13. Soil Morphology (Natural Soil Samples Only):
    Structure of Soil Horizon Tested
    Consistence of Soil Horizon Tested: Dry: Moist:
14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples): K1
15. I hereby certify that the information furnished on Form 3c of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-A et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator — Date



10/14/2021

TerraSense Laboratory Manager, Totowa, NJ

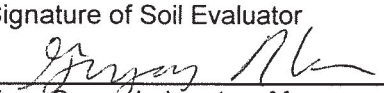
Signature of Professional Engineer — License #

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Form 3c. Soil Permeability Class Rating Data

1. Project Number 20-932 Replicate (Letter) B
2. Sample Depth 7.2 Soil Pit/Boring Number TP-2 Sample S-3
3. Coarse Fragment Content:
   - Total Weight of Sample, WT, grams: 650.42
   - Weight of Material Retained on 2mm sieve, WCF, grams: 461.80
   - Wt. % Coarse Fragments (W.C.F. / W.T. x 100): 71.0
4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.: 39.16
5. Hydrometer Calibration, Rc: 6.25
6. Hydrometer Reading -- 40 seconds, grams, R1: 26
   - Temperature of suspension. °F: 71
7. Corrected Hydrometer Reading, grams, R1': 20.4
8. Hydrometer Reading -- 2 hours, grams, R2: 12.962
   - Temperature of suspension. °F: 70
9. Corrected Hydrometer Reading, grams, R2': 7.1
10. % Sand = (Wt. - R1')/Wt. x 100 = 48%
11. % Clay = R2'/Wt. x 100 = 18%
12. Sieve Analysis:
    - a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction: 21.61
    - b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams: 14.88
    - c. % Fine Plus Very Fine Sand (b/a): 69%
13. Soil Morphology (Natural Soil Samples Only):
    - Structure of Soil Horizon Tested
    - Consistence of Soil Horizon Tested: Dry: Moist:
14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples): K1
15. I hereby certify that the information furnished on Form 3c of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-A et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator

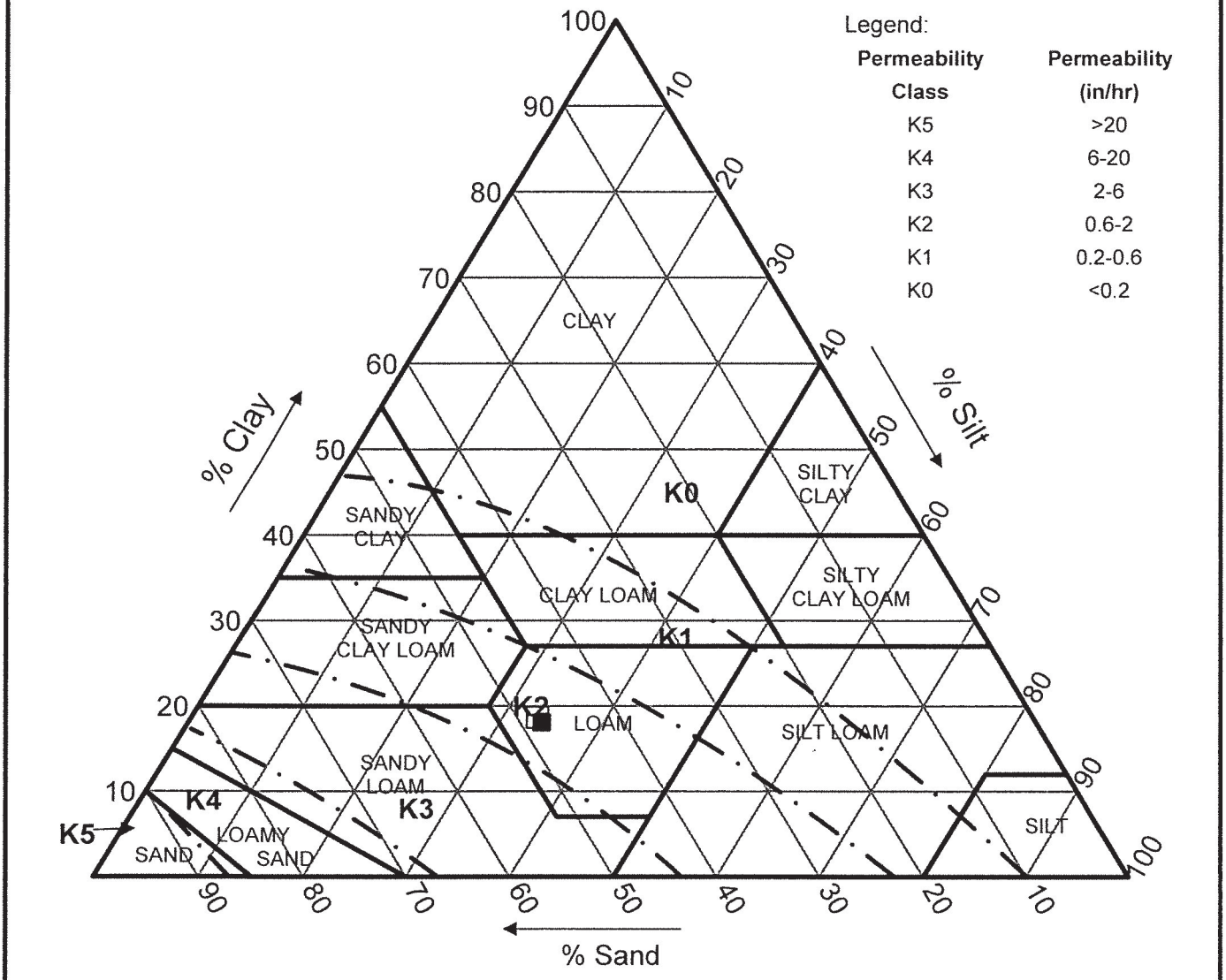


TerraSense Laboratory Manager, Totowa, NJ

Date: 10/14/2021

Signature of Professional Engineer

License #



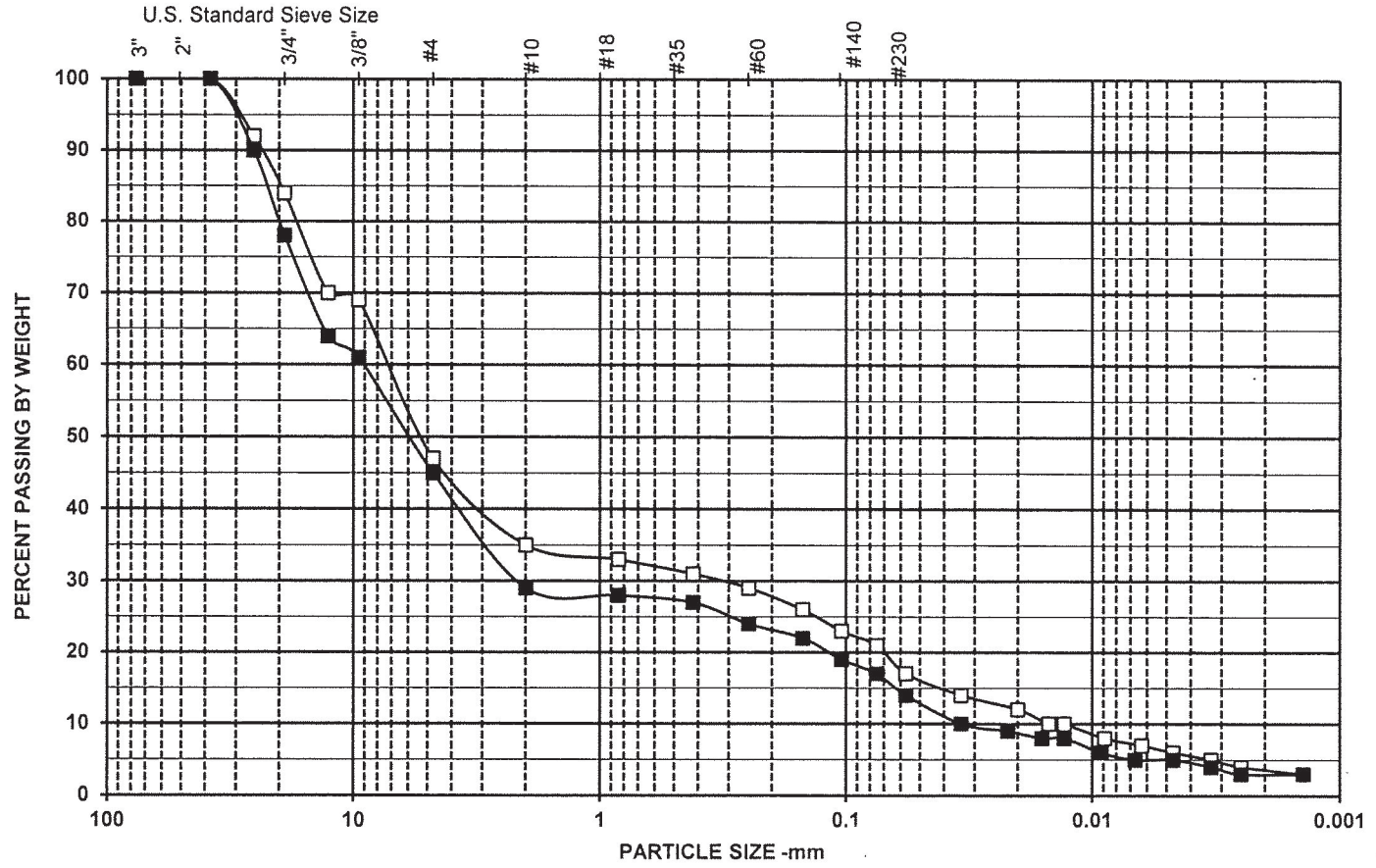
Symbol	Boring Sample	REPLICATE	Normalized Values % Sand	% Clay	% Silt	Permeability Class Rating measured	corrected*	USDA Textural Classification
□	TP-2 S-3	A	48.0	18.7	33.3	K2	K1	Loam
■	TP-2 S-3	B	47.9	18.1	34.0	K2	K1	Loam

*as corrected for very fine sand component

Matrix New World Engineering, P.C. Project # 20-932	**Mercer County Titusville, NJ DPMC Washington Crossing Visitor Center**	**Soil Permeability / Textural Triangle by Permeability Class Rating Test**
TerraSense Project # 21005948A		

USDA CLASSIFICATION	GRAVEL	SAND					SILT	CLAY
		VC	C	M	F	VF		

USCS CLASSIFICATION	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	FINE	



PLOT SYMBOL	USCS GROUP SYMBOL	USDA CLASSIFICATION	DESCRIPTION AND REMARKS
□	GM	Loam	Brown, Silty gravel with sand
■	GM	Loam	Brown, Silty gravel with sand

Symbol	□	■
Boring	TP-2	TP-2
Sample	S-3	S-3
Replicate	A	B
Depth	7.2	7.2
% +3"		
% Gravel	65	71
% SAND	19	16
% V.C.Sand	3	2
% C.Sand		
% M.Sand	3	3
% F.Sand	6	5
% V.F.Sand	7	6
% SILT	12	10
%CLAY	4	3
w (%)	12.8	12.1

Particle Size	PERCENT FINER	
(Sieve #)	□	■
4"	100	100
3"	100	100
1 1/2"	100	100
3/4"	84	78
3/8"	69	61
#4	47	45
#10	35	29
#20	33	28
#40	31	27
#60	29	24
#100	26	22
#200	21	17

PARTICLE SIZE DISTRIBUTION

Matrix New World Engineering, P.C.

DPMC Washington Crossing Visitor

Project No.	
21005948A	October 2021

TerraSense

APPENDIX D

PERMEABILITY TEST LOGS

MATRIXNEWORLD
Engineering Progress

Test ID No PT- TP-B1
Sheet 1 of 1

Prepared for:	DPMC			PROJECT:	Washington Crossing		
				PROJECT NUMBER:	20-932		
				PROJECT LOCATION:	Titusville, NJ		
INSPECTOR:	L. Martin	CONTRACTOR:	Heritage Contracting Co.	TEST LOCATION:	Within proposed stormwater basin		
P.E./REP.:	Nick DeCotiis	OPERATOR:	Chris Sigle			Weather:	Clear
		EXCAVATING EQUIPMENT:	CAT 308C	Test Depth:	5 ft		

Presoak 1 (30 minutes)		Presoak 2 (30 minutes)		
Start time:	10:00 AM	Start time:	10:08 AM	
Finish time:	10:08 AM	Finish time:	10:17 AM	
		Water drop:	5.0	in

Procedure and Log Adapted From ASTM D-3385

Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer

Maximum interval for measurement:	10	min

Testing Procedure

The drop in water level in the **inner** ring, during the **second** 30-minute interval of the presoak will be used to determine the time interval between readings during the test as follows:

A. If 2 inches or more drained during full presoak: use 10 minute measurement intervals.

B. If less than 2 inches drained during full presoak: use 30 minute measurement intervals.

Refill both rings to the mark or rim after each reading for 8 consecutive readings, or until a stabilized rate is achieved.

(A stabilized rate means a difference of ¼-inch or less of drop between the lowest and highest readings of three consecutive measurements.)

	Water Drop		Time	
TRIAL 1	1.3	in	10	min
TRIAL 2	1.35	in	10	min
TRIAL 3	1.31	in	10	min
TRIAL 4		in		min
TRIAL 5		in		min
TRIAL 6		in		min
TRIAL 7		in		min
TRIAL 8		in		min

Final Permeability
7.88 in/hr

Inspectors Remarks:

STORMWATER MANAGEMENT REPORT

NEW VISITOR CENTER
355 WASHINGTON CORSSING – PENNINGTON ROAD,
TITUSVILLE
MERCER COUNTY, NEW JERSEY 08560

MATRIXNEWORLD

Engineering Progress

Prepared by:

Matrix New World Engineering, Land Surveying
and Landscape Architecture, PC
442 State Route 35, 2nd Floor
Eatontown, NJ 07724

Matrix No. 20-932

March 10, 2023

Nicholas DeCotiis, PE
NJ Professional Engineer License No. 24GE4785900

TABLE OF CONTENTS

LIST OF APPENDICES

1.0 Project Description

The subject property is identified as Block 121, Lot 3 and is located in Titusville, Mercer County, New Jersey. The subject site maintains frontage on Washington Crossing-Pennington Road to the southeast and River Road to the southwest**.** The property location is indicated in Appendix A, on the USGS Topographical Map. The overall project area is 3.27 acres.

The existing site consists of an open grassed area with gravel and bituminous walks and an asphalt access road. The topography indicates five existing drainage areas. DA-1 receives overland flow from the existing visitor center, which continues downhill onsite until it reaches Washington Crossing Pennington Road. DA-2 receives overland flow from the existing access road and hillside flowing west towards River Road. DA-3 receives overland flow from the hillside east of the access road flowing east towards Washington Crossing Pennington Road. DA-4 and DA-5 receive overland flow from the overlook area.

Storm catchment networks receiving flow from DA-1, DA-2, and DA-3 discharge directly into the Delaware River Canal across River Road. The inlets receiving flow from the overlook area, DA-4 and DA-5, convey runoff to pipes extending beneath the canal and discharge directly into the Delaware River, a tidal water body. The sub-area distribution based on land cover and soils has been indicated on the Existing Drainage Area Map enclosed within this report.

According to the Soil Resource Report information made available by USDA National Resources Conservation Service (NRCS) 16.9% of the site consists of Birdsboro loam, 2 to 6 percent slopes (BhmB), 75.5% of the site consists of Birdsboro loam, 2 to 6 percent slopes eroded (BhmB2), and 7.5% of the site consists of Birdsboro loam, 6 to 12 percent slopes eroded (BhmC2). All three soil types are classified as Hydrologic Soil Group (HSG) Type B soil. The soil boundary and properties are detailed in the NRCS Soil Resource Report included in Appendix C.

The proposed development includes the construction of a 16,514 SF visitor's center building, porous asphalt parking, asphalt and concrete walkways, a reinforced grass accessway for emergency vehicles, and a small-scale bioretention basin. The project also includes landscaping, lighting, water, sewer, and drainage improvements.

The proposed site improvements are shown on drawings entitled “New Visitor Center, Washington Crossing State Park, 335 Washington Crossing-Pennington Road, Titusville, Mercer County, NJ 08560” dated 07/22/2022, prepared by Ikon5 Architects.

2.0 Methodology And Software

A detailed drainage study is described in the following sections of this report. The stormwater runoff flows that were determined for pre- and post-development conditions were calculated using the NRCS Methodology, as described in Technical Release 55 – Urban Hydrology for Small Watersheds (TR-55). Hydrographs and stormwater management basin routings have been developed in accordance with TR-20 methodology. These modeling techniques are incorporated in the HydroCAD V 10.00 software package which was used to analyze the pre- and post-development flows and basin routings.

New Jersey 24-Hour Rainfall Frequency Data for the subject site, made available by National Oceanic and Atmospheric Administration (NOAA), was utilized in the stormwater management design. The pre- and post-development hydrologic characteristics for the design of the stormwater management system are based upon the 2-, 10-, and 100-year frequency storm events. The water quality calculations are based upon the NJDEP 1.25 inch/2-hour variable distribution storm. To adequately demonstrate stormwater management control and compliance, peak reduction factors of 50%, 75%, and 80% were applied to the 2-, 10-, and 100-year pre- development peak runoff rates, respectively.

3.0 Green Infrastructure Standards

In accordance with the green infrastructure requirements specified in NJAC 7:8-5.3, green infrastructure best management practices (BMP) were selected to satisfy groundwater recharge, stormwater runoff quantity and stormwater runoff quantity standards. The two types of BMP utilized are small-scale bioretention systems and pervious paving systems. In accordance with the NJ Stormwater BMP Manual the small-scale bioretention systems are designed for contributary areas less than 2.5 acres and the pervious paving systems are designed for contributary areas less than 3x the area occupied by the pervious surface.

4.0 Stormwater Quantity

4.1 Pre-Development Site Conditions and Allowable Peak Rates

Please refer to the Pre-Development Drainage Area Map within this report (Appendix L.1). The total pre-development drainage area of study is approximately 5.17 acres including 1.90 acres of off-site runoff flowing into the limit of work.

The summary of pre-development and allowable flow rates are shown in Tables 1 and 2 below. Please refer to Appendix E for pre-development 2-, 10-, and 100-year storm proposed event calculations.

Table 1: Pre-development and Allowable Peak Flow Rates to Canal (EDA-1, EDA-2, EDA-3, EDA-4, EDA-5)

Freq. Storm Event (yr)	Pre-development Peak Flow rate (cfs)	Peak Reduction Factor	Allowable discharge rate (cfs)
2	1.91	50%	0.96
10	5.80	75%	4.35
100	15.20	80%	12.16

4.2 Post-Development Site Conditions & Proposed Peak Rates

Please refer to the Post-Development Drainage Area Map within this report (Appendix L.2). The overall post-development drainage area of study matches that of pre-development conditions at approximately 5.17 acres.

In post-developed conditions the stormwater runoff is divided into five (5) numbered drainage areas discharging to the same locations as the matching-number pre-development drainage area.

PDA-1 is the location of the existing Visitor Center to be demolished. In the proposed condition it will be a grassed area discharging into a grassed area of the site. PDA-1 ultimately discharges to the storm network located along Washington Crossing Pennington Road.

PDA-2 is the location of the proposed parking. Surface runoff sheet flows from outside of the work area to the southwest along the existing paved access road. This area is split by the crown of the road, pushing flows into the area of proposed parking. The proposed parking is designed in its entirety as pervious pavement with underdrain. Overflow catch basins are located along the pervious pavement and are connected by underdrains allowing any storm overflow exceeding the infiltration capacity of the pavement surface to be collected and flow through the storage bed. The

proposed parking is the only motor vehicle surface of the proposed improvements. The pervious pavement is designed to manage the Water Quality of runoff from this area. Discharge from the pervious pavement is directed into the storm network managing PDA-3.

PDA-3 is the location of the proposed Visitor Center. The proposed building will have two sections of green roof. Surface runoff sheet flows from outside of the work area to the southeast towards the back of the building. To the northeast, behind the building, are several yard inlets collecting overland flow from uphill. Southwest of the building is a paved pedestrian walk extending from the proposed parking around the building face. Roof and surface runoff from the outdoor classroom area and pedestrian walk are discharged into this network of yard inlets. The yard inlets pipe into a bioretention basin. The small-scale bioretention basin receives flow from 94,287 SF (2.17 ac) and is designed for infiltration. One area flowing in a southerly direction bypasses the bioretention basin by overland flow, PDA-3T. These areas are delineated further in Appendix L – Sub-Catchment Drainage Map for each inlet.

PDA-4 and PDA-5 are the western and eastern areas of the overlook, respectively. These areas mirror one another. The pedestrian walkway extends from the upper portion of these areas southwest to the retaining wall at the edge of the overlook. Surface runoff sheet flows from the building face towards the overlook. At the uphill edge of the pedestrian walkway along the retaining wall, a french drain collects runoff. The french drain conveys stormwater into the two existing catch basins at either side of the overlook. The catch basins discharge into pipes discharging into the Delaware and Raritan Canal.

Table 2 compares the allowable peak flow rate from the site and the resultant post-development peak outflow rates.

Table 2: Allowable & Post-Development Peak Flow Rates to Canal (PDA-1, PDA-2, PDA-3, PDA-4, PDA-5)

Freq. Storm Event (yr)	Allowable Post-Development Peak Flow Rate (cfs)	Proposed Post-Development Peak Flow Rate (cfs)
2	0.96	0.96
10	4.35	3.95
100	12.16	12.08

Please refer to Appendix F for post-development 2-, 10-, and 100-year storm proposed event calculations.

The proposed outlet structures contain various sized orifices and overflows which will attenuate the runoff produced by the various storms. The outlet control features are included in Appendix E and shown on the project drawings.

5.0 Stormwater Quality

5.1 Regulated Motor Vehicle Surface

In accordance with NJAC 7:8-5.5(a), runoff quality standards apply if there is an increase in regulated motor surface of 0.25 acres or more. The stormwater rules define regulated motor vehicle surface as the net increase of pervious or impervious surface that is intended to be used by motor vehicles and/or the total area of motor vehicle surface that is currently receiving water quality treatment.

Proposed areas of increased regulated motor vehicle surface include PDA-1A. PDA-1A is directed towards a pervious pavement system. Pervious pavement provides the required 80% TSS removal by meeting the design guidelines of the BMP Manual.

Please refer to Appendix G for post-development Water Quality Design storm proposed event calculations.

5.2 Delaware and Raritan Canal State Park

NJAC 7:45, the Regulations for The Delaware and Raritan Canal Commission (DRCC) defines the area within 1,000 feet on either side of the center line of the Canal as Zone A. The DRCC Regulations require 95% TSS removal for the Water Quality Design Storm for projects discharging to existing outfalls in the Canal. The entirety of the Project Area is located within Zone A. A field investigation has located the outfalls for the storm drainage network branches receiving flows from the Project Area. Both branches receiving surface runoff within Washington Crossing State Park and along River Road (receiving surface runoff sheet flowing from Washington Crossing State Park) discharge into the Canal.

The proposed pervious pavement and bioretention basin are both designed to retain the entire Water Quality Design Storm from their respective drainage areas, including the proposed parking

and building. Other drainage areas disturbed within the project area exhibit no increase in motor vehicle surface and are primarily existing grassed areas remaining grassed in the proposed condition. The proposed improvements therefore meet the DRCC water quality requirements for existing outfalls.

Please refer to Appendix G for post-development Water Quality Design storm proposed event calculations.

6.0 Groundwater Recharge

NJAC 7:8-5.4(b) requires that a proposed major land development shall be required to maintain 100 percent of the site's average annual pre-developed groundwater recharge volume after development or to infiltrate 100 percent of the difference between the site's pre- and post-development 2-year runoff volumes.

Permeability testing (Appendix D, section 6.3) indicates the location of the proposed bioretention basin and permeable pavement provides adequate hydraulic conductivity for infiltration and thus groundwater recharge. Therefore the bioretention basin and permeable pavement have been designed to meet post-development annual recharge deficit for the site.

The bioretention basin is a vegetated surface recharge BMP. Thus the lower surface depth (dEXC) is assigned a value of 0 inches, and the upper level of the BMP surface (dBMPu) is negative (-36.0 in). The BMP Area (ABMP) is 4,082.0 sq.ft.

The post-development annual recharge deficit for the site is 37,555 cu ft. The recharge volume (Vdef) has been apportioned by the fraction of post-development impervious area tributary (Aimp) to each BMP. The pervious pavement provides 15,938 cu.ft and the bioretention basin provides 22,158 cu.ft. of Annual Recharge Volume, or 41% and 59% respectively. Both BMPs provide their recharge volume utilizing less than their total depth. Calculations are provided in Appendix H.

6.1 Groundwater Table Hydraulic Impact Assessment

NJAC 7:8-5.2(h) requires that the hydraulic impact to the groundwater table of any proposed infiltration BMPs be analyzed. The Hantush Spreadsheet, developed by USGS in cooperation with the NJ DEP has been utilized to perform this analysis. The pervious pavement and

bioretention basin are designed to infiltrate to subsoils. The hydraulic impact analysis of the pervious pavement and bioretention basin is included in Appendix I.

7.0 Soil Erosion and Sediment Control

To minimize the effects of erosion, the proposed design and construction concepts and practices incorporate the standards for Soil Erosion and Sediment Control in New Jersey as provided by the New Jersey State Soil Conservation Committee. These erosion deterrents include the use of silt fence or other sediment barriers at downgrade slopes as per SCS standards. In addition, dust control measures, stone tracking mats, and temporary and permanent vegetative cover will be utilized. General notes and guidelines are provided on the Soil Erosion and Sediment Control Plans for the contractor in order to protect against soil erosion throughout the construction process.

Two scour holes have been designed at pipe outlets at the pervious pavement and discharging into the bioretention basin. Scour holes provide point-discharge stability in large storm flows. 25-year design flows are included in appendix J and sizing calculations are included in appendix K.

8.0 Conclusion

In conclusion, the stormwater runoff quantity requirements have been met with the design of the proposed stormwater management system which reduces the stormwater peak flow runoff in post-development conditions to less than the required 50%, 75%, and 80% of the pre-development 2-, 10-, and 100-year storm events, respectively. Stormwater quality requirements are achieved through the use of pervious pavement in the motor vehicle surface area, and bioretention providing excess water quality enhancement in other areas of the site. Groundwater recharge is achieved utilizing both pervious pavement and bioretention basin BMPs. Green Infrastructure was prioritized in BMP selection.

Based on the above, it is Matrix New World Engineering's opinion that the proposed development will not have any negative impact on the surrounding area or on the existing storm sewer systems.

Appendix A:

Project Location Map

Appendix B:

NOAA Precipitation Frequency Data

Appendix C:

NRCS Web Soil Survey Report

Appendix D:

Permeability Testing Report

Appendix E:

Pre-Development Flow Calculations

Appendix F:

Post-Development Flow Calculations

Appendix G:

Water Quality Design Storm BMP Calculations

Appendix H:

Groundwater Recharge Spreadsheet

Appendix I:

Hantush Groundwater Table Hydraulic Impact Spreadsheet

Appendix J:

Scour Hole 25-year Storm Flow Rates

Appendix K:

Scour Hole Size Calculations

Appendix L:

Sediment Basin Size Calculations

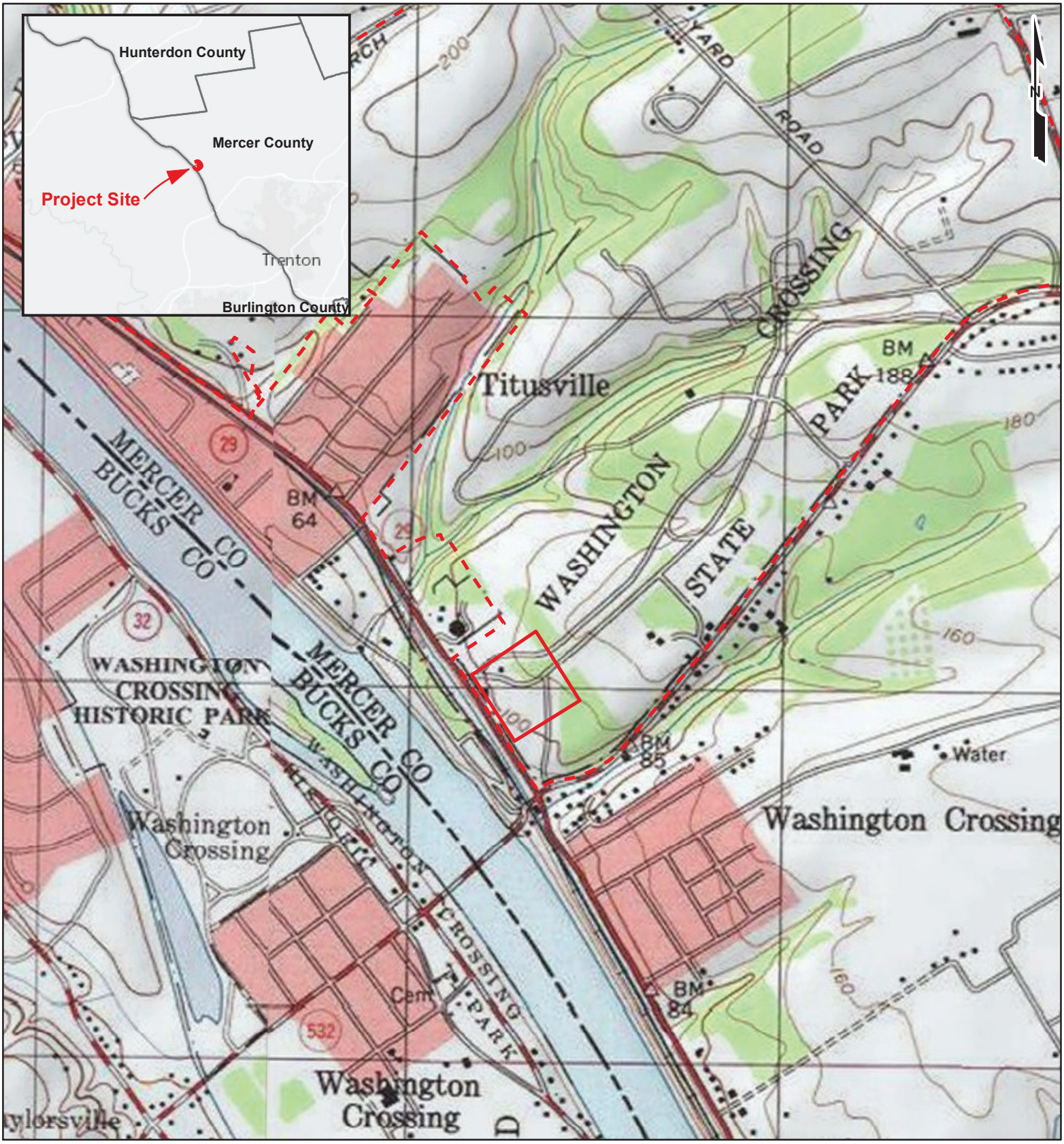
Appendix M:

Drainage Area Maps

M.1 – Pre-Development Drainage Area Map

M.2 – Post-Development Drainage Area Map

M.3 – Sub-Catchment Drainage Area Map



WASHINGTON CROSSING STATE PARK
355 WASHINGTON CROSSING PENNINGTON ROAD
TITUSVILLE, MERCER COUNTY, NEW JERSEY

FIGURE 1
USGS LOCATION MAP

SOURCE: ESRI Data; NJGIN Parcel Data

NOAA Atlas 14, Volume 2, Version 3
Location name: Titusville, New Jersey, USA*
Latitude: 40.2986°, Longitude: -74.8659°
Elevation: 104.08 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.343 (0.311-0.377)	0.408 (0.371-0.450)	0.485 (0.439-0.533)	0.539 (0.488-0.594)	0.607 (0.546-0.668)	0.656 (0.587-0.722)	0.704 (0.628-0.777)	0.749 (0.664-0.829)	0.805 (0.706-0.895)	0.847 (0.737-0.948)
10-min	0.547 (0.497-0.603)	0.653 (0.594-0.720)	0.776 (0.703-0.854)	0.863 (0.780-0.949)	0.968 (0.870-1.06)	1.05 (0.935-1.15)	1.12 (0.997-1.24)	1.19 (1.05-1.31)	1.27 (1.12-1.42)	1.33 (1.16-1.49)
15-min	0.684 (0.621-0.753)	0.821 (0.747-0.905)	0.982 (0.889-1.08)	1.09 (0.987-1.20)	1.23 (1.10-1.35)	1.32 (1.18-1.46)	1.41 (1.26-1.56)	1.50 (1.33-1.66)	1.60 (1.41-1.78)	1.68 (1.46-1.87)
30-min	0.938 (0.852-1.03)	1.13 (1.03-1.25)	1.40 (1.26-1.54)	1.58 (1.43-1.74)	1.82 (1.63-2.00)	1.99 (1.78-2.19)	2.17 (1.93-2.39)	2.33 (2.07-2.58)	2.55 (2.24-2.84)	2.71 (2.36-3.03)
60-min	1.17 (1.06-1.29)	1.42 (1.29-1.57)	1.79 (1.62-1.97)	2.06 (1.86-2.27)	2.42 (2.17-2.66)	2.70 (2.42-2.97)	2.98 (2.66-3.29)	3.27 (2.90-3.62)	3.66 (3.21-4.07)	3.96 (3.45-4.43)
2-hr	1.41 (1.28-1.56)	1.72 (1.56-1.90)	2.17 (1.96-2.39)	2.52 (2.27-2.77)	2.99 (2.68-3.29)	3.37 (3.00-3.71)	3.76 (3.33-4.15)	4.16 (3.66-4.60)	4.72 (4.11-5.25)	5.16 (4.44-5.76)
3-hr	1.55 (1.40-1.72)	1.89 (1.71-2.10)	2.38 (2.15-2.65)	2.77 (2.49-3.08)	3.31 (2.96-3.67)	3.75 (3.33-4.16)	4.20 (3.70-4.67)	4.67 (4.08-5.20)	5.33 (4.59-5.96)	5.86 (4.98-6.58)
6-hr	1.96 (1.77-2.18)	2.37 (2.15-2.65)	2.99 (2.70-3.33)	3.50 (3.14-3.88)	4.22 (3.75-4.68)	4.82 (4.25-5.35)	5.46 (4.78-6.07)	6.16 (5.32-6.84)	7.15 (6.08-8.00)	7.98 (6.68-8.97)
12-hr	2.38 (2.15-2.66)	2.88 (2.61-3.22)	3.65 (3.30-4.07)	4.31 (3.87-4.80)	5.28 (4.69-5.86)	6.11 (5.39-6.80)	7.03 (6.12-7.82)	8.05 (6.89-8.98)	9.56 (8.02-10.7)	10.9 (8.95-12.3)
24-hr	2.75 (2.54-2.99)	3.32 (3.07-3.62)	4.21 (3.89-4.58)	4.96 (4.56-5.39)	6.07 (5.54-6.58)	7.02 (6.36-7.60)	8.06 (7.24-8.73)	9.19 (8.17-9.97)	10.9 (9.53-11.8)	12.3 (10.6-13.4)
2-day	3.19 (2.94-3.48)	3.86 (3.55-4.21)	4.89 (4.50-5.33)	5.75 (5.27-6.26)	6.99 (6.36-7.59)	8.03 (7.27-8.72)	9.16 (8.23-9.95)	10.4 (9.24-11.3)	12.2 (10.7-13.3)	13.6 (11.9-15.0)
3-day	3.38 (3.12-3.67)	4.08 (3.77-4.44)	5.14 (4.75-5.59)	6.02 (5.54-6.54)	7.29 (6.66-7.90)	8.34 (7.58-9.03)	9.47 (8.55-10.3)	10.7 (9.58-11.6)	12.4 (11.0-13.5)	13.9 (12.2-15.2)
4-day	3.56 (3.30-3.86)	4.30 (3.98-4.67)	5.40 (4.99-5.86)	6.30 (5.81-6.82)	7.59 (6.96-8.21)	8.65 (7.90-9.35)	9.78 (8.88-10.6)	11.0 (9.92-11.9)	12.7 (11.4-13.8)	14.2 (12.5-15.4)
7-day	4.17 (3.87-4.52)	5.01 (4.65-5.42)	6.21 (5.75-6.72)	7.20 (6.65-7.79)	8.62 (7.93-9.30)	9.79 (8.97-10.6)	11.0 (10.1-11.9)	12.4 (11.2-13.4)	14.3 (12.8-15.5)	15.9 (14.1-17.2)
10-day	4.76 (4.44-5.12)	5.68 (5.30-6.12)	6.94 (6.47-7.46)	7.96 (7.41-8.56)	9.39 (8.70-10.1)	10.6 (9.74-11.3)	11.8 (10.8-12.6)	13.0 (11.9-14.0)	14.8 (13.4-15.9)	16.2 (14.6-17.5)
20-day	6.43 (6.04-6.84)	7.63 (7.17-8.11)	9.11 (8.56-9.69)	10.3 (9.64-10.9)	11.9 (11.1-12.6)	13.1 (12.2-13.9)	14.3 (13.3-15.2)	15.6 (14.4-16.6)	17.3 (15.9-18.5)	18.6 (17.0-19.9)
30-day	8.00 (7.58-8.45)	9.44 (8.94-9.96)	11.0 (10.4-11.6)	12.3 (11.6-12.9)	13.9 (13.1-14.6)	15.1 (14.2-15.9)	16.3 (15.3-17.2)	17.5 (16.4-18.5)	19.1 (17.7-20.2)	20.2 (18.8-21.5)
45-day	10.2 (9.69-10.7)	12.0 (11.4-12.6)	13.8 (13.1-14.5)	15.2 (14.4-15.9)	16.9 (16.0-17.8)	18.2 (17.2-19.2)	19.5 (18.4-20.5)	20.6 (19.4-21.7)	22.1 (20.8-23.3)	23.2 (21.7-24.5)
60-day	12.2 (11.7-12.8)	14.3 (13.7-15.0)	16.3 (15.6-17.1)	17.9 (17.0-18.7)	19.7 (18.8-20.7)	21.1 (20.1-22.2)	22.4 (21.3-23.5)	23.6 (22.4-24.8)	25.1 (23.7-26.4)	26.1 (24.6-27.5)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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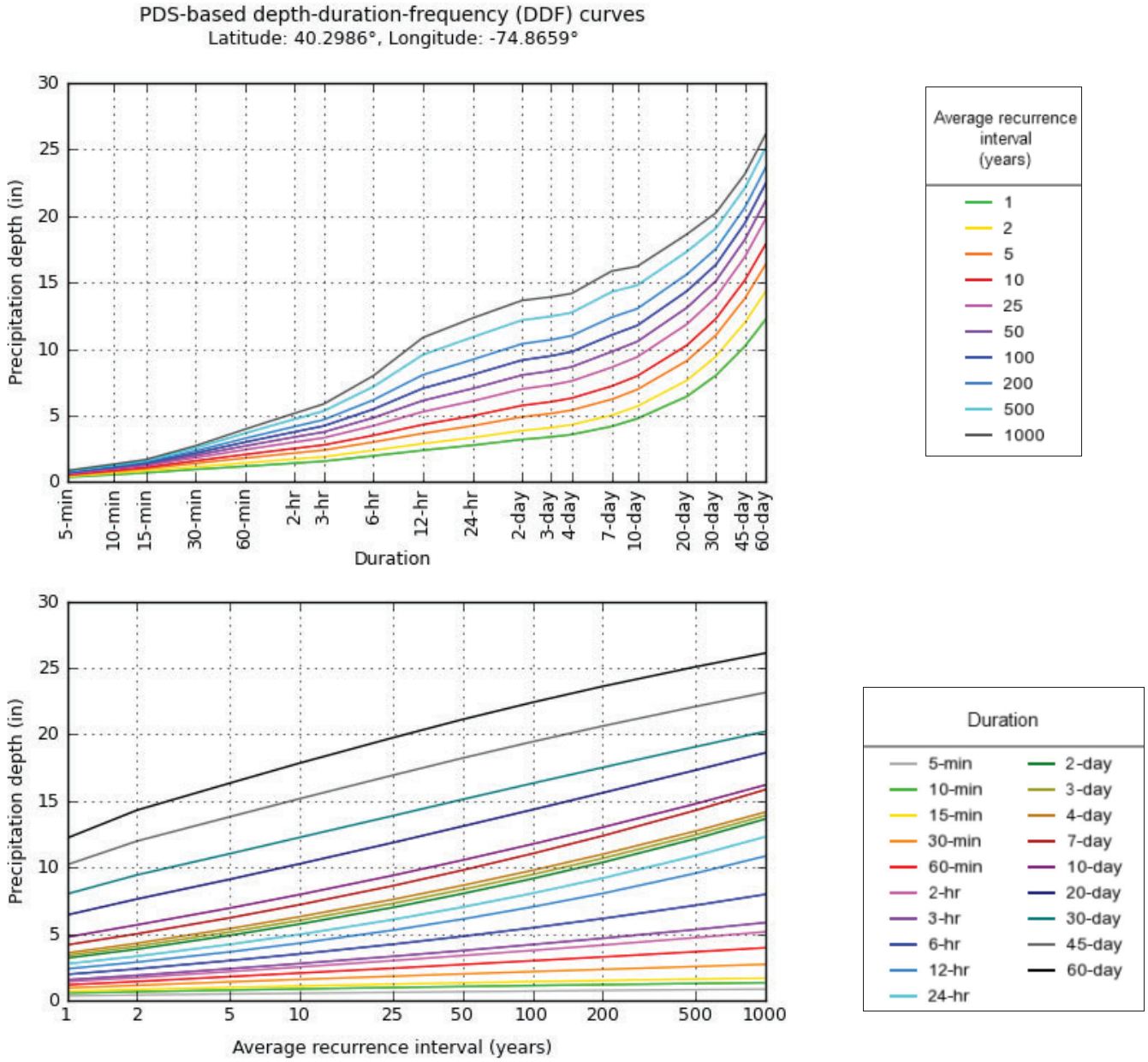
PF graphical



NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Mon Dec 19 19:32:29 2022

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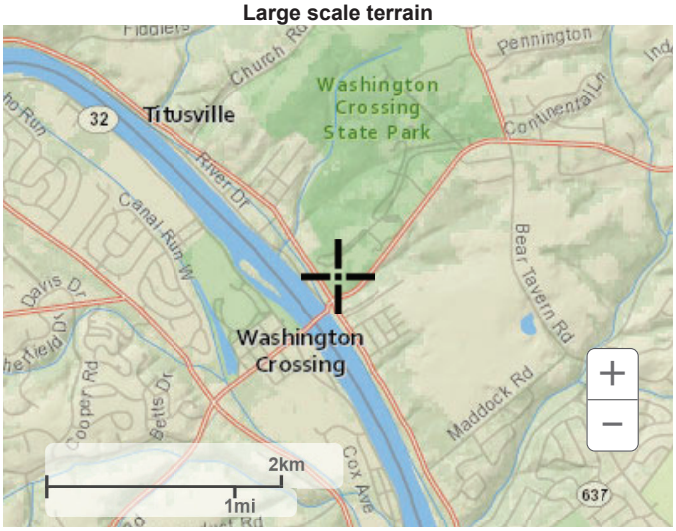
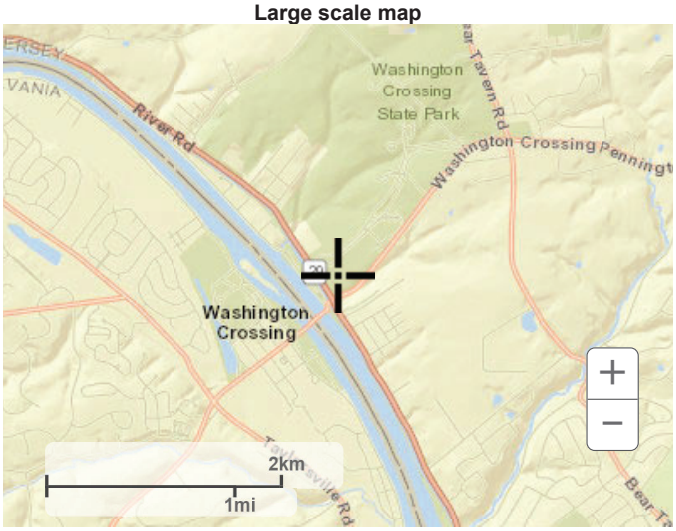
Maps & aerials

Small scale terrain

Large scale terrain



Large scale map



Large scale aerial

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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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United States Department of Agriculture

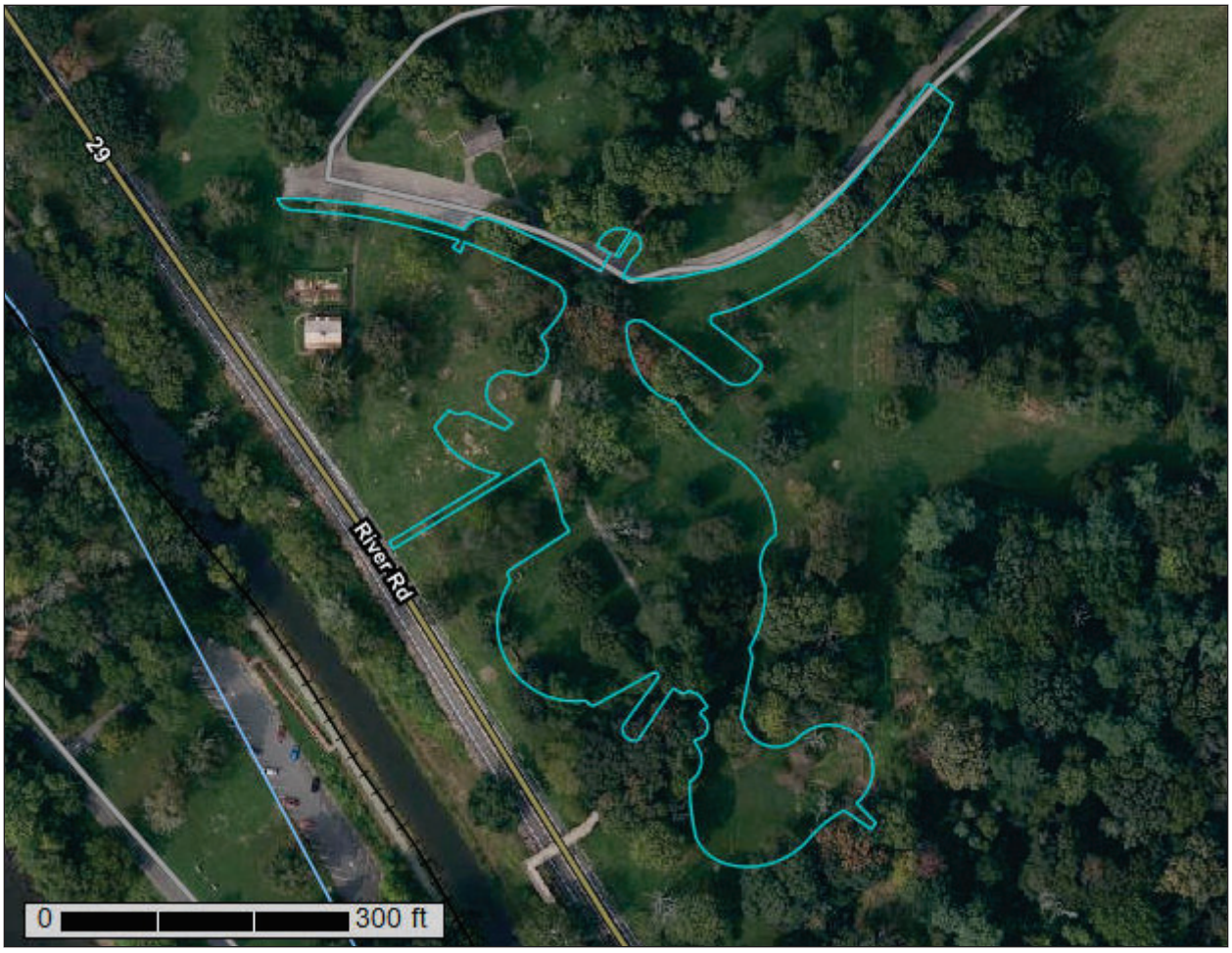
NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Mercer County, New Jersey

Washington Crossing State Park - New Visitor Center



December 23, 2022

Preface

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

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

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

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

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

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

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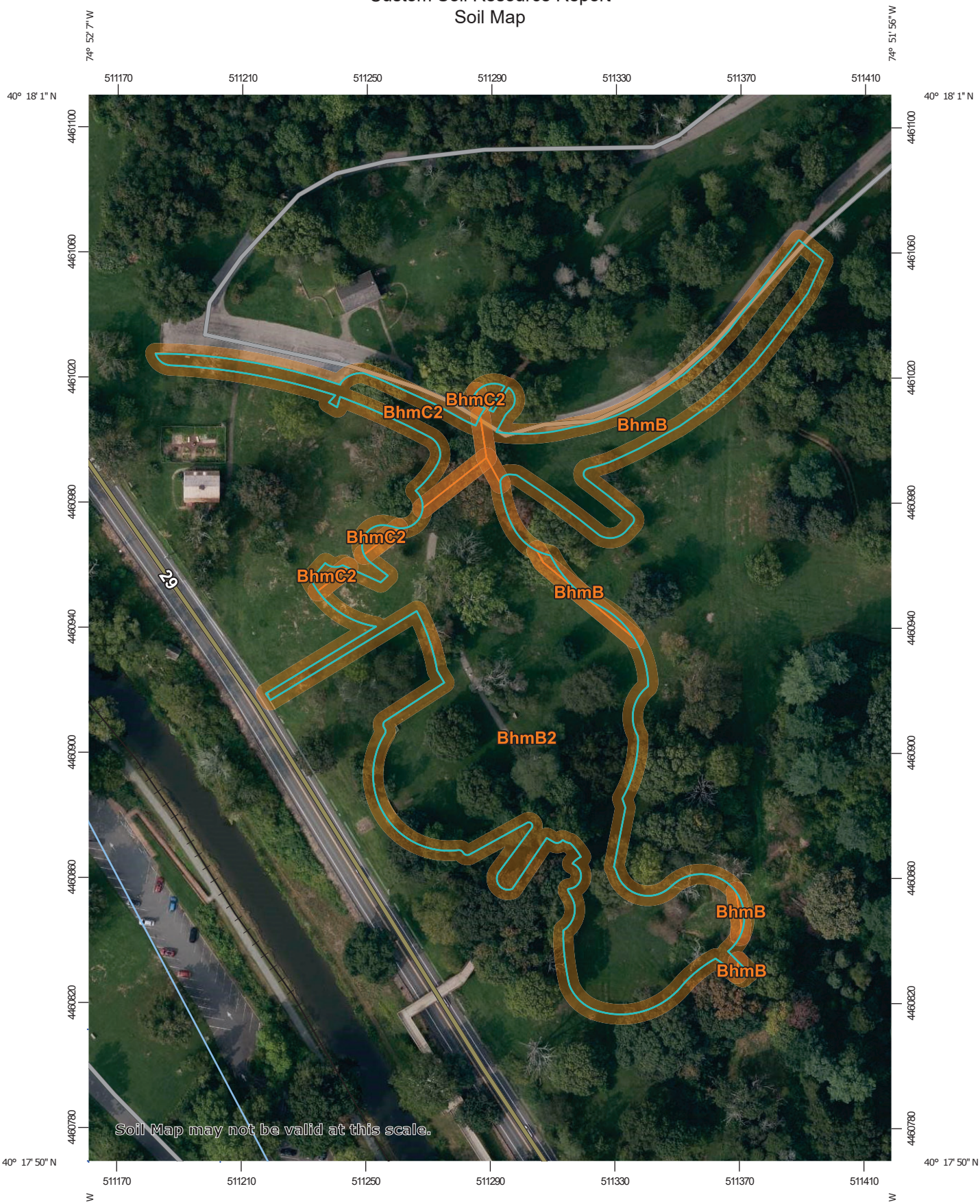
Contents

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,660 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Mercer County, New Jersey
Survey Area Data: Version 18, Aug 30, 2022

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

Date(s) aerial images were photographed: Sep 6, 2020—Sep 21, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BhmB	Birdsboro loam, 2 to 6 percent slopes	0.6	16.9%
BhmB2	Birdsboro loam, 2 to 6 percent slopes, eroded	2.5	75.5%
BhmC2	Birdsboro loam, 6 to 12 percent slopes, eroded	0.2	7.5%
Totals for Area of Interest		**3.3**	**100.0%**

Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Mercer County, New Jersey

BhmB—Birdsboro loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 1kj0h
Elevation: 200 to 1,200 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Birdsboro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Birdsboro

Setting

Landform: Stream terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Old alluvium derived from sandstone and siltstone and/or shale

Typical profile

Ap - 0 to 12 inches: loam
E - 12 to 15 inches: loam
Bt - 15 to 22 inches: silt loam
BC - 22 to 32 inches: silt loam
2C - 32 to 48 inches: sandy loam
2R - 48 to 80 inches: weathered bedrock

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 48 to 60 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F148XY025PA - Moist, Triassic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Bucks

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Penn

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Rowland, frequently flooded

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

BhmB2—Birdsboro loam, 2 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 1kj0j
Elevation: 200 to 1,200 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Birdsboro, eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Birdsboro, Eroded

Setting

Landform: Stream terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Old alluvium derived from sandstone and siltstone and/or shale

Typical profile

Ap - 0 to 10 inches: loam
E - 10 to 15 inches: silt loam
Bt - 15 to 22 inches: silt loam
BC - 22 to 32 inches: silt loam
2C - 32 to 48 inches: sandy loam
2R - 48 to 80 inches: weathered bedrock

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 48 to 60 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F148XY025PA - Moist, Triassic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Rowland, frequently flooded

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Penn

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Bucks

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

BhmC2—Birdsboro loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 1lrcc
Elevation: 200 to 1,200 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Birdsboro, eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Birdsboro, Eroded

Setting

Landform: Stream terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Old alluvium derived from sandstone and siltstone and/or shale

Typical profile

Ap - 0 to 8 inches: loam
E - 8 to 15 inches: silt loam
Bt - 15 to 22 inches: silt loam
BC - 22 to 32 inches: silt loam
2C - 32 to 48 inches: sandy loam
2R - 48 to 80 inches: weathered bedrock

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 48 to 60 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Ecological site: F148XY025PA - Moist, Triassic, Upland, Mixed Oak - Hardwood - Conifer Forest
Hydric soil rating: No

Minor Components

Bucks, eroded
Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Rowland, frequently flooded
Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Penn
Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Map Scale: 1:1,660 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Mercer County, New Jersey
Survey Area Data: Version 18, Aug 30, 2022

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

Date(s) aerial images were photographed: Sep 6, 2020—Sep 21, 2020

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

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BhmB	Birdsboro loam, 2 to 6 percent slopes	B	0.6	16.9%
BhmB2	Birdsboro loam, 2 to 6 percent slopes, eroded	B	2.5	75.5%
BhmC2	Birdsboro loam, 6 to 12 percent slopes, eroded	B	0.2	7.5%
Totals for Area of Interest			**3.3**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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GEOTECHNICAL ASSESSMENT REPORT

STATE OF NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
NEW VISITOR CENTER
WASHINGTON CROSSING STATE PARK
TITUSVILLE, NEW JERSEY
PROJECT NO. P1222-00

MATRIXNEWORLD

Engineering Progress

Prepared for:

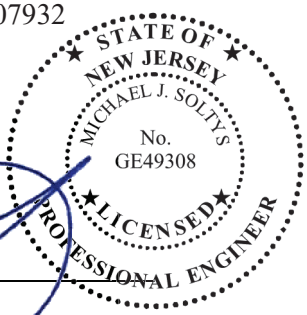
State of New Jersey
Department of the Treasury
Division of Property Management and Construction
Trenton, New Jersey 08625

Prepared by:

Matrix New World Engineering, Land Surveying
and Landscape Architecture, P.C.
26 Columbia Turnpike
Florham Park, New Jersey 07932

Matrix No. 20-932

February 2022



Michael J. Soltys, P.E.
NJ Professional Engineer License No. 24GE04930800

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FIGURES

APPENDICES

1.0 INTRODUCTION

Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C. (Matrix) has completed a geotechnical assessment to support the proposed construction at Washington Crossing State Park in Titusville, New Jersey (Site). A Site Location Map is provided as Figure 1.

Matrix provided geotechnical services as a consultant to the New Jersey Division of Property Management and Construction (DPMC). The purpose of the geotechnical assessment was to evaluate the suitability of the on-site soils for the proposed construction of a new Visitor Center. A total of 7 geotechnical borings were advanced to depths of 6 to 18 feet below ground surface (bgs). Four test pits and one permeability test were also conducted at the Site to obtain soil profile and drainage characteristics of the existing subsurface soils.

Matrix's geotechnical recommendations are based on an evaluation of the subsurface conditions as indicated by the field exploration data and geotechnical laboratory test results on representative soil samples. These recommendations will address the geotechnical components of the anticipated construction to ensure that the proposed loads can be safely transferred to the underlying soil.

2.0 SITE LOCATION & PROJECT DESCRIPTION

The Site is located at the Washington Crossing State Park in Titusville, New Jersey. A Site Location Map is provided as Figure 1. The subsurface field program was conducted within the south corner of the park, near the existing overlook.

The design intent for this project is to construct a new Visitor Center. The new Visitor Center will include an auditorium/theater, workspace for the museum staff, gift shop with storage and a climate controlled and secured artifact storage space, along with all the accompanying utilities. The building will be just under 15,000 square feet and will incorporate green technology.

To assist in the future design and construction within the project area, geotechnical borings were advanced within the expected construction area to obtain information regarding the soil's structural properties. Four test pits were excavated to obtain soil profile information at the proposed locations of a septic field and stormwater basin. A permeability test was also performed above the water table to observe the drainage potential of the existing on-site soils at the potential location of a stormwater basin. The 7 borings and permeability test were located to provide the most useful information about the subsurface conditions. Refer to Figure 2 of this report for a map of the as-drilled boring and test pit locations.

3.0 GEOLOGIC SETTING

According to the Bedrock Geologic Map of New Jersey (dated 2014), the Site location is founded on the Passaic Formation, where Sandstone, siltstone, and shale are likely to be encountered. A Geologic Map is provided as Figure 3.

From the Surficial Geologic Map of Central and Southern New Jersey (dated 2000), the natural surface material (beyond fill) is suggested to be silty clayey to sandy silty sandstone, siltstone, and shale residuumr. The Surficial Geology map is shown in Figure 4.

The soil descriptions presented above are consistent with the findings from the subsurface field program, in which Silt was observed throughout the length of each boring, with varying amounts of Sand. Below the Silt layer, Mudstone bedrock was encountered.

4.0 SUBSURFACE FIELD PROGRAM

The subsurface field program was completed by generally accepted practices in the Geotechnical Engineering field and consisted of the advancement of 7 Standard Penetration Test (SPT) borings via mud rotary drilling techniques and 4 test pits via an excavator.

A Matrix Geotechnical Engineer provided full-time drilling oversight, soil logging, and sample collection. Matrix prepared the field boring logs, which included sample depths, SPT-N blow counts, soil/rock recovery, and soil/rock descriptions based on the Burmister Soil Classification System followed by the Unified Soil Classification System (USCS) letter symbol. The soil boring logs are provided in Appendix A. Classification tables and charts used to determine the soil attributes are included in Appendix B.

Upon the completion of the field program, representative samples were subjected to geotechnical laboratory analyses. Laboratory results aided in soil and rock classification and assessing the relevant engineering properties of the stratigraphic layers which were used in developing the revised geotechnical design recommendations outlined herein. Geotechnical laboratory reports are included in Appendix C.

4.1 SPT Borings

Matrix retained Craig Geotechnical Drilling Co., Inc. (Craig) located in Mays Landing, New Jersey, to complete the subsurface field program under observation of a Matrix Geotechnical Engineer qualified in Geotechnical Engineering in New Jersey. On September 13, 2019, 7 borings (B-1 through B-7) were advanced with a CME 850 to depths of 6 to 18 feet bgs. The locations of the completed borings were identified in the field by taping and line of sight measurements. The approximate as-drilled boring locations are shown on Figure 2.

Split spoon (SS) samples were collected in accordance with ASTM D-1586, *Standard Method for Penetration Test and Split-Barrel Sampling of Soils*. A standard 2-inch outer diameter split spoon, two feet in length, was used to collect the soil samples. An automatic 140-pound hammer having a 30-inch drop was used to drive the split spoon sampler. SPT blow counts were recorded for the 0- to 6-inch interval, the 6- to 12-inch interval, the 12- to 18-inch interval and the 18- to 24-inch interval. The SPT N-values for design purposes are reported as the sum of the SPT N-values observed for the above referenced 6- to 12-inch interval and the 12- to 18-inch interval that the split spoon sampler was driven. Rock coring was not performed. However, the type of rock encountered is comparatively soft and samples was possible using a split spoon.

SPT N-values can be used to provide a qualitative indication of the in-place relative density for cohesionless soils and, in a less reliable way, an indication of consistency for cohesive soils. They can also be used to approximate soil strength properties. The indications are qualitative, since many factors can significantly affect N-values and prevent direct correlations, including differences among drill crews, drill rigs, drilling procedures, and hammer-rod-sampler assemblies.

The Matrix Geotechnical Engineer observed the split spoon sampling procedure and collected representative samples in sealed containers for further examination. Each boring was continuously sampled to 12 feet bgs and at every subsequent 5-foot interval thereafter, unless noted otherwise on the boring logs (Appendix A). The borings were backfilled with soil cuttings and bentonite hole plug (if necessary), patched with asphalt patch, or grouted upon completion of the borehole.

4.2 Test Pits

In addition to soil borings and split spoon sampling, 4 test pits were excavated to obtain soil profile information. Matrix retained Heritage Contracting Company (Heritage), located in Cranbury, New Jersey to advance a test pits under observation of a Matrix Geotechnical Engineer qualified in Geotechnical Engineering in New Jersey. On September 15, 2021, 4 test pits were advanced with a CAT 308C excavator to depths where rock refusal was observed. Test pits TP-B1 and TP-B2 were advanced to 14.5 and 15 feet bgs, respectively, at the potential location of a stormwater basin. Test pits TP-S1 and TP-S2 were advanced to 10.5 and 11 feet bgs, respectively, at the potential location of a septic field. The locations of the completed test pits were identified in the field by taping and line of sight measurements. The approximate locations are shown on Figure 2.

4.3 Permeability Testing

A permeability test was performed in general conformance with the NJDEP Stormwater Best Management Practices Manual via the double ring infiltrometer test method in TP-B2 at a depth of 5 feet. The double rings were inserted into the soil 2 to 3 inches then filled with water to allow presoaking. Presoaking was completed for two intervals of up to 30 minutes. The rings were then refilled, and the water level was measured in 10-minute intervals. When the drop in water level was stabilized, the permeability was calculated.

4.4 Laboratory Testing

In addition to the field program, a laboratory testing program was conducted to determine additional pertinent engineering characteristics of representative samples of on-site soils. The laboratory testing program was performed in general accordance with applicable ASTM standard test methods and included physical/textural testing of representative samples of various strata.

Upon review of the boring logs, Matrix selected representative samples for laboratory testing. Laboratory testing of selected samples was completed by TerraSense, LLC, located in Totowa, New Jersey. The following table presents a summary of the testing program.

Table 4.1: Laboratory Testing Program

Test	Testing Procedure	Number of Samples Tested	Sample Locations and Depth Intervals
Water Content	ASTM D2216	6	B-1: 4-6’ B-2: 10-11.7’ B-3: 10-12’ B-4: 4-6’ B-6: 6-8’ B-7: 4-6’
Sieve Analysis	ASTM D6913	6	B-1: 4-6’ B-2: 10-11.7’ B-3: 10-12’ B-4: 4-6’ B-6: 6-8’ B-7: 4-6’
Atterberg Limits	ASTM D4318	3	B-1: 4-6’ B-4: 4-6’ B-7: 4-6’
Permeability Class Rating (Double Point)	NJ 7:9A-6.3	3	TP-S2: 4’, 5’, 7.2’

The results of the laboratory testing program, provided in Appendix C, were used to assist in developing geotechnical design parameters and recommendations.

5.0 SUBSURFACE CONDITIONS

The subsurface conditions beneath the Site can be characterized by the following stratigraphy, proceeding from the surface cover downward, unless noted otherwise below. The USCS group symbol for each soil type is indicated in parentheses following the soil descriptions on the boring logs. The various soil types were grouped into the major strata shown on the boring logs. The stratification lines designating the interfaces between strata on the boring logs should be considered approximate. In situ, these transitions could be gradual and could occur at slightly different levels from those indicated by the boring logs. The rest pits showed similar soil profiles to the borings. Soil boring logs are provided in Appendix A. Classification tables and charts used to determine the soil attributes are included in Appendix B.

Surface Cover

All borings were completed within a grass area, at the south corner of the park. As such, the surficial material consisted of grass and topsoil at each boring.

Stratum 1: Silty Sand/Silt (SM, ML)

Underlying the grass surface cover, a layer of brown silty sand material was encountered with varying amount of silt. This layer generally extended to depths ranging from 5 to 8 feet bgs. The SPT N-values for Stratum 1 typically indicated very loose to loose Silt material, with values ranging from 1 to 13 blows per foot (bpf). Medium dense Silt was encountered at the bottom of the Stratum. The SPT N-values for Stratum 1 are summarized in the table below.

Table 5.1: Very Loose/Loose SPT N-Values for Stratum 1

Soil Boring Location	USCS Group Symbol	Depth Below Ground Surface (ft)	SPT N-Values
B-1	SM	0-6	1-3
B-2	SM	0-8	2-8
B-3	SM	0-4	2-7
B-4	ML	0-6	1-3
B-5	ML	0-5	3-7
B-6	ML	0-4	2-3
B-7	SM	0-4	3-6

Table 5.2: Medium Dense SPT N-Values for Stratum 1

Soil Boring Location	USCS Group Symbol	Depth Below Ground Surface (ft)	SPT N-Values
B-3	SM	4-6	13
B-6	ML	4-5	11
B-7	SM	4-6	10

Stratum 2: MUDSTONE (DECOMPOSED ROCK)

Underlying the Silt layer, Mudstone rock was encountered. This type of rock is softer than most. As such, it was able to be sampled using a split spoon. When sampled, it broke down into sand, silt, and gravel size fragments. The SPT N-values for Stratum 2 typically indicated very dense material, with some medium dense material near the top of the layer in some borings. Values ranged from 16 to over 100 blows per foot. The SPT N-values for Stratum 2 are summarized in the table below.

Table 5.3: Medium Dense SPT N-Values for Stratum 2

Soil Boring Location	Depth Below Ground Surface (ft)	SPT N-Values
B-2	8-11.7	22
B-3	6-8, 10-12	17, 16-22
B-6	5-6	25

Table 5.4: Dense/Very Dense SPT N-Values for Stratum 2

Soil Boring Location	Depth Below Ground Surface (ft)	SPT N-Values
B-1	6-8.25	61-over 100
B-2	15-16.25	Over 100
B-3	8-10, 17-18.5	35, over 100
B-4	6-11.5	31-over 100
B-5	5-6.3	Over 100
B-6	6-10	62-over 100
B-7	6-6.5	Over 100

Groundwater

While most of the samples taken were dry, wet soil was observed at the bottom of the Silt layer in borings B-3 and B-4 at depths of 6 and 5.5 feet, respectively. This wet section was only about 4 inches thick. The Mudstone rock immediately below it was observed to be dry or slightly moist. Thus, it is likely that a perched water table exists just above rock. A similar situation was observed in test pits TP-S1 and TP-S2, where water was found approximately 2-3 inches above hard rock. The absence or presence of groundwater in the borings reflects the conditions at the time of the subsurface exploration only. Fluctuations in the locations of groundwater tables or the presence of perched water levels could occur as a result of seasonal variations in evaporation, precipitation, surface water run-off, and other factors. Therefore, water levels at future times could vary from those observed at the time of the borings.

6.0 GEOTECHNICAL DESIGN PARAMETERS

6.1 General Subsurface Parameters

The geotechnical design parameters in this report are derived from the field program and are based on accepted geotechnical standards and practices.

Table 6.1 summarizes the recommended geotechnical design parameters for the various soil strata encountered at the Site. The values are based on review and interpretation of the subsurface field program and laboratory test data results.

Table 1806.2 of the 2018 International Building Code provides allowable coefficients of friction to be used in the evaluation of resistance to sliding. For the native dense granular soil and Controlled Fill, the recommended coefficient of friction against sliding is 0.25.

Table 6.1: Geotechnical Design Parameters

Stratum	Unit Weight	Friction Angle (Φ)	Cohesive Strength, c_u	Earth Pressure Coefficient		Net Allowable Foundation Pressure*	Lateral Bearing
				Active	Passive		
	(pcf)	(deg)	(psf)	(Ka)	(Kp)	(psf)	(psf/ft. bgs)
Controlled Fill	γ = 125 γ' = 63	32°	0	0.31	3.26	4,500	200
Native Dense Decomposed Rock (SP, SP-SM, SM) [Class 2, SPT N > 10]	γ = 125 γ' = 63	35°	0	0.27	3.69	4,500	200
Native Loose Granular Soil (SP, SP-SM, SM) [Class 5, SPT N ≤ 10]	γ = 105 γ' = 43	30°	0	0.33	3.00	1,500	150
Silt (ML) Loose [Class 5, SPT N < 10]	γ = 90 γ' = 28	26°	150	0.39	2.56	N/A	75
Silt (ML) Medium [Class 5, 10 ≤ SPT N ≤ 30]	γ = 115 γ' = 53	28°	400	0.36	2.77	1,500*	100

Notations: γ = moist unit weight, γ ' = buoyant unit weight, and c_u = average undrained shear strength.

* These values are based on the 2018 International Building Code and adjusted for field conditions encountered. To increase the allowable foundation pressure above the values recommended in the table given above, further testing of soil will be required. In Cohesive soils, it should be noted that the shallow footing may fail under the settlement criteria before the footing pressure approaches the anticipated allowable bearing capacity. Allowable Foundation Pressure values assume the water table is below the influence depth of the foundation.

- Coefficient of earth pressure at rest may be computed using Jaky's equation, Ko = 1 – Sin ϕ'.

6.2 Seismic Design Parameters

Based on a review of the subsurface conditions relevant to section 1613 of the 2018 International Building Code New Jersey Edition, the subject site may be classified as a Site Class C. For a Risk Category equal to I/II/III and 0.2 Second Design Acceleration (S_{DS}) equal to 0.173 g, the subject site may be assigned to Seismic Design Category (SDC) B. Seismic design parameters are presented in the table below.

Table 6.2: Seismic Design Parameters

Parameter	Value*
0.2 sec. Bedrock Acceleration, S_s	0.20 *g*
1.0 sec. Bedrock Acceleration, S_1	0.053 *g*
Site Class	C
0.2 sec. Site Coefficient, F_a	1.3
1.0 sec. Site Coefficient, F_v	1.5
0.2 sec. Design Acceleration, S_{DS}	0.173 *g*
1.0 sec. Design Acceleration, S_{D1}	0.053 *g*
Seismic Design Category, SDC	B

* Value(s) obtained from the IBC Section 1613, Earthquake Loads. The "*g*" is acceleration due to gravity, and $g = 32.2$ ft/s^2 or 9.81 m/s^2.

Liquefaction is the full or partial loss of shear strength of granular or cohesionless soils during an earthquake. The potential consequences of liquefaction could include loss of bearing capacity causing collapse or excessive settlement of ground. Potentially liquefiable soil types include loose and medium dense clean sands, silty sands and silts below the water table and to a depth of 50-feet below the ground surface. Due to the absence of a groundwater table and the shallow depth of rock, liquefaction was deeped to no be an issue.

6.3 Permeability Rates of Existing On-Site Soils

A total of 4 test pits (TP-B1, TP-B2, TP-S1, and TP-S2) were advanced as part of the subsurface investigation on September 15, 2021. Test pits TP-B1 and TP-B2 were located based on an approximate location of a proposed stormwater basin, and test pits TP-S1 and TP-S2 were located based on an approximate location of a proposed septic field. Please note that laboratory testing labeled TP-1 and TP-2 refers to TP-S1 and TP-S2 within the report. Permeability testing was conducted via the double ring infiltrometer method in TP-B1, and permeability rates were calculated in accordance with the NJDEP Stormwater Best Management Practices Manual. The observed permeability was 7.88 inches per hour at a depth of 5 feet bgs. According to Table 12-10 of the NJ Stormwater BMP Manual Chapter 12: Soil Testing Criteria, this classifies the soil under Soil Hydraulic Conductivity Class K4.

Soil samples for permeability testing were taken from the septic field test pit TP-S2 at depths of 4, 5, and 7.2 feet bgs. Samples were delivered to Terrasense, LLC in Totowa, New Jersey for testing. The permeability class rating test was performed with the soil samples to ascertain the drainage characteristics of the soil within each field. Testing details are summarized in Table 6.3. Laboratory testing results are presented in Appendix C.

Table 6.3 – Permeability Testing Summary

Test Pit Location	Sample	Sample Depth (ft bgs)	Permeability Class Rating
TP-S2	1	4	K2
TP-S2	2	5	K2
TP-S2	3	7.2	K1

7.0 GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

The following sections present the results of our geotechnical engineering evaluation and recommendations for support of the planned construction.

7.1 Site Preparation and Earthwork

Prior to demolition and stripping operations, all utilities should be identified and protected. Existing pavements, topsoil, organic matter (i.e., trees, roots, vegetative matter), debris, and deleterious materials should be removed at least five feet beyond the limits of the proposed structure areas.

All remaining underground utilities and utility backfill should be evaluated to determine if these elements are suitable for support of the planned loads. The Contractor must keep those utilities to be reused in workable condition and protected from damage during earthwork activities. Utilities not planned for re-use should be removed from planned structural areas, capped off at the property lines, and either removed or abandoned in place. All soils disturbed by utility abandonment operations should be removed or re-compacted in-place under observation of a geotechnical engineer.

Prior to placing any fill materials to raise grades to designed subgrade elevations as necessary, the existing exposed subgrade soils should be compacted to a firm and unyielding surface with several passes in two perpendicular directions of a minimum 10-ton vibratory, smooth drum roller. To help identify any soft or loose pockets which may require removal and replacement or further attention after compaction of the subgrade, the surface should be proof-rolled in the presence of the owner's geotechnical engineer. Typical equipment used for the proof-rolling effort consists of a fully loaded tandem axle truck; if site constraints limit the use of this equipment, equivalent alternatives may be considered subject to engineer approval. Proof-rolling should be conducted after a suitable period of dry weather to avoid degrading an otherwise acceptable subgrade. Any fill or backfill should be placed and compacted in accordance with the recommendations provided herein. If construction activities are performed during winter months, all frozen soils encountered at or below proposed subgrade elevations should be removed and replaced with controlled fill in accordance with the recommendations herein.

Every effort should be made to minimize disturbance of the on-site soils by construction traffic and surface runoff. The on-site soils will deteriorate when subjected to repeated construction traffic and will likely require removal and replacement. Any type of disturbance to moisture-sensitive soils can potentially affect settlement, bearing capacity, and the shrinkage/swelling of clays. The services of a geotechnical engineer

should be retained to observe soil conditions during construction and verify the suitability of prepared foundations for support of the design loads.

Organic and plastic soil types, if encountered at the site, can be used as fill materials in landscape areas. Any such materials encountered during grading operations should be either stockpiled for later use in landscape fills, or should be placed in approved disposal areas either on-site or off-site.

Development of the Site during periods of favorable weather and stringent quality control of soil moisture will be critical to construction schedules. Construction haul roads should be constructed throughout the Site prior to the start of construction to maintain Site access and construction traffic. If the surface soils contain materials that may be erodible, the Contractor should provide and maintain good site drainage during earthwork operations to help to maintain the integrity of the surface soils. All erosion and sedimentation practices should be in accordance with sound engineering practice and current local requirements. Surface water should be directed away from the construction area, and the work area should be sloped at gradients of 1 percent and sealed at the end of each day with a smooth static drum roller to minimize the potential for ponding water and subsequent saturation of the surface soils. If subgrade soils are overly wetted, over excavation should be anticipated.

7.2 General Foundation Recommendations

Based on the results of the subsurface investigation, Matrix anticipates that the existing subsurface soils will be capable of supporting the proposed structures using shallow foundations. The finished foundations should be installed at least 3 feet bgs to protect the structures' foundations from possible frost heave during cold weather conditions. This assumed frost depth should be confirmed with the local jurisdictional building department prior to construction activities.

Actual bearing conditions of soil materials within shallow footing areas should be confirmed in the field during excavation, by inspection, under the direction of a Professional Engineer registered in the State of New Jersey.

Should any unsuitable materials be encountered beneath the proposed foundation bearing depths, over-excavation and replacement of the unsuitable materials will be required to provide a suitable footing subgrade. Approximately six inches of existing soil below the foundation bottom is recommended to be replaced with ¾-inch clean crushed stone to serve as a "cushioning layer" for uniform transition of structural

loads to the underlying subsurface. All foundation bottoms should be completely cleaned of loose material or debris and maintained in a dry condition immediately prior to the placement of the subgrade base course.

All foundation excavations must be protected to prevent the disturbance of the subgrade materials and to minimize any potential loss of support capacity. To minimize disturbance to the subgrade soils during excavation, we recommend that a bucket without scarifying teeth, in addition to hand excavation methods, be used during the final phases of the excavation for the foundations. Foundation concrete generally should be placed for foundations during the same day that the foundation excavations are made and approved. Should excavating and placing the foundation concrete the same day not be practical, or if groundwater levels are close to the footing subgrades, it is recommended that a concrete mud mat, 2 to 3 inches thick, be placed to protect the subgrade soils from moisture changes and disturbance. If protection of the soils is not provided, then undercutting of softened soils may be necessary prior to the placement of reinforcing steel and foundation concrete.

Any over-excavation to be restored with Controlled Fill will need to extend at least one foot laterally beyond footing edges for each vertical foot of over-excavation. Lateral over-excavation can be reduced if the grade is restored with lean concrete or approved flowable fill. The bottom of over-excavations should be compacted with walk-behind compactors, vibrating plates or plate tampers ("jumping jacks") to compact locally disturbed materials.

Shallow Foundations

Based on information obtained during the current subsurface investigation, Matrix has provided an option for the proposed structures to be supported by conventional shallow foundations.

Excavation for shallow foundations should proceed down to the decomposed rock layer. The depth of the decomposed rock layer varies between 5 and 8 feet below grounds. Foundation bottom elevation can then be raised by adding controlled fill as described in Section 7.5. Alternatively, foundation footings can be poured on the decomposed rock layer. Either method will achieve an expected bearing capacity of 4,500 pounds per square foot.

A settlement analysis performed using the software Settle3 by Rocscience for footings as big as 6 by 6 feet showed that the maximum expected settlement is less than 0.3 inches. Differentiatial settlement between a 6 by 6 feet footing and the smallest proposed footing (3 by 3 feet) is expected to be 0.2 inches. These results

fall below the typical maximum tolerable limits of 1 inch for total settlement and 0.5inches for differential settlement.

To ensure adequate frost protection, the shallow foundation bottoms should be placed at least 36” below the finished grade, provided the respective allowable bearing capacity of the subgrade soil recommended on Table 6.1 meets the footing pressure. If any soft or loose soils are encountered, the unsuitable material should be removed, replaced, and compacted with new Controlled Fill as per Section 7.5 of this report. The excavated subgrade should be protected from prolonged exposure to air and water to minimize the damaging effect of weathering, to provide sufficient bearing capacity and to reduce differential settlement. To protect the subgrade material, it is recommended that the exposed subgrade be covered with at least 4” to 6” of compacted ¾” stone. A professional engineer competent in the field of geotechnical engineering, and registered in the State of New Jersey, should verify the suitability of the subgrade.

Substantial compaction operations in conformance with Section 7.1 should be completed and benchmark elevations measured between passes to confirm no additional settlement or consolidation is encountered. Matrix would also recommend the Contractor allows sufficient time (a minimum of one month) for any additional settlement or consolidation of cohesive materials as a result of the additional fill before foundation or pavement construction operations commence. In order to reduce the possibility of excessive settlement due to local shear or "punching" action, we recommend that column footings have a minimum lateral dimension of 3 feet and continuous wall footings should have a minimum width of 2 feet, even if smaller dimensions can be justified using the allowable bearing capacity provided above. Spread footings need not be symmetrical. Within the core of the building, where foundation loads are highest, footings may be combined as necessary to meet the recommended bearing capacity. If this results in spread footings covering more than about 60% of the core footprint, we recommend that a mat foundation be considered

7.3 Construction Recommendations for Pavements, Slabs, and Utilities and Miscellaneous Site Improvements

The proposed development of the project site is anticipated to include sub-grade for pavements, utilities, and concrete footing construction for miscellaneous site improvement structures. The bottom of the subgrade should be excavated clean so a hard bottom is provided for the support of structures or utility pipes. All fill used to establish the footing subgrade level, as necessary, should be Controlled Fill, placed and compacted under engineering controls as per Section 7.5 of this report. To protect concrete slabs exposed to frost heave, controlled crack joints and shrinkage joints should be provided at regular intervals.

An 8-inch-thick layer of ¾-inch crushed clean stone should be placed as base course between the subgrade and the bottom of the concrete footing slab.

The properly prepared Controlled Fill/backfill materials in paved areas or utility trenches are expected to yield a minimum subgrade modulus (k) of 150 psi/in provided that a minimum of 4 inches of aggregate subbase materials are provided and the subgrade has been prepared in accordance with the recommendations of this report. If any soft or loose soils are encountered, the unsuitable material should be removed, replaced and compacted with new Controlled Fill as per Section 7.5 of this report. Should the thickness of unsuitable soil to be removed be greater than 3 feet in trench or footing areas, deep foundations are recommended as a viable option. If such a situation is encountered, Matrix shall assess and reevaluate a viable deep foundation system. At this moment, Matrix rules out any such situation will be encountered. In the event there is a significant time lag between the site grading work and the fine grading of concrete slab areas prior to the placement of the subbase stone or concrete, the Geotechnical Engineer should verify the condition of the prepared subgrade. Prior to final slab construction, the subgrade may require scarification and re-compaction to provide firm and stable conditions.

If a utility trench excavation becomes soft due to the inflow of surface water or groundwater, a minimum of six inches of crushed stone shall be placed on the bearing soil to provide a firm base for support of the pipe.

It should also be understood that the recommended pavement sections were not designed to support heavy construction equipment loads which would require an augmented section. The contractor should construct temporary haul and construction roadways and routes about the site as appropriate for the specific weather conditions and construction equipment he intends to employ, and the overburden soil conditions encountered in the specific areas. Construction period traffic should not be routed across the recommended pavement sections unless augmented.

We recommend basement slabs and below grade walls be fully dampproofed to limit water vapor infiltration into occupied and moisture sensitive spaces. We recommend a membrane type dampproofing product be used, such as products by W.R. Grace & Co. For horizontal applications, we recommend that the membrane be installed on a 2-inch-thick concrete substrate (mudslab).

7.4 Excavations/Dewatering/Drainage

Excavation near existing foundations shall not remove the existing lateral or vertical support without protecting the existing foundation against settlement or lateral translation by providing underpinning or shoring. Underpinning and shoring should be provided as per Chapter 33 of the 2018 International Building Code. The contractor is solely responsible for construction site safety, including excavation safety. Excavations should be performed in accordance with the requirements of *29 CFR Part 1926, OSHA Safety and Health Regulations for Construction, Excavations*. It is anticipated that excavations will generally be open cut. The fill and underlying soils, above and below the water table, are considered Type C soils. The maximum allowable slopes stipulated by OSHA for Type C soils are 1.5 H:1 V. Flatter slopes may be required based on actual conditions encountered. Actual conditions encountered during construction should be evaluated by a competent person (as defined by OSHA) to ensure that safe excavation methods and/or shoring and bracing requirements are implemented. Sheeting and bracing, if required, should be designed by a Professional Engineer licensed in New Jersey with earth and water pressures, as well as equipment and other surcharge loads, considered.

The groundwater table was observed right above rock during the subsurface investigation. Due to the shallow depth of groundwater, dewatering is expected to be a concern for this project. As noted before, the groundwater table can be impacted by seasonal variations, precipitation, and other climatic factors. Presence of groundwater at foundation depths may severely impede the constructability of structures due to possible inflow of groundwater into the open excavation. The appropriate measures to be taken for groundwater control during construction should be determined in the field at the time of excavation and are the responsibility of the Contractor.

7.5 Controlled Fill

Matrix recommends that portions of the on-site natural soil may be reused for backfilling as Controlled Fill if it meets the requirements provided within this section, is subjected to removal of all unsuitable material such as topsoil, boulders, concrete, brick, organic matter, etc. and is approved by the owner's Professional Engineer licensed in New Jersey and qualified in geotechnical engineering. If the excavated fill material and on-site natural soils cannot be reused, imported structural fill should be used as Controlled Fill. The imported Controlled Fill should be a granular, structurally sound, free-draining fill, free of organic material and any other deleterious material. Controlled Fill should be a natural Sand or Sand and Gravel with no particles larger than three inches and the material passing the No. 200 sieve shall be non-plastic. The chosen Fill soil should meet the gradation of the table below.

Table 7.1: Grain Size Distribution for Controlled Fill

Sieve Size Designation	Percentage Passing by Weight
Passing 3 inch	100
Passing 2 inch	90 – 100
Passing ¼ inch	30 – 70
Passing #10	15 – 60
Passing #40	5 – 40
Passing #200	0 – 10

Controlled Fill shall be placed in lifts not exceeding 12-inches thick, in loose state. Should the Controlled Fill be compacted with a plate compactor or jumping jack compactor, the fill must be placed in lifts not exceeding 8-inches thick, in loose state. Each lift of backfill should be compacted to at least 95 percent of the maximum dry density within three percent of the optimum moisture content, as determined in accordance with the procedures of ASTM D1557, *Laboratory Compaction Characteristics of Soil Using Modified Effort* (56,000 ft-lbf/ft^3 (2,700 kN-M/M^3)). Controlled Fill placed within ten feet of walls, foundations, utility lines and auxiliary structures should be compacted with plate compactors; the lift thickness should be adjusted if necessary to obtain the required degree of compaction. In-place density tests (i.e., nuclear density gauge or equivalent) should be performed at a frequency of not less than one per 2,500 sf of backfill placed, and not less than one test per two feet of material placed. In addition, if compaction is being conducted near an existing foundation, the Controlled Fill shall be placed in lifts and compacted such that it does not damage the existing foundation.

At the end of each workday, all fill areas should be graded to facilitate drainage of any surface runoff associated with precipitation and should be sealed by use of a smooth-drum roller to limit infiltration of surface water. During placement and compaction of new fill, the Contractor should be prepared to scarify existing subgrade soils or previously placed fills so that a weak plane will not be formed between the new fill and existing subgrade soils, as directed by the Geotechnical Engineer. Where and when needed, as directed by the Geotechnical Engineer, the Grading Contractor should scarify subgrade soils to depths of about 4 inches prior to placement of new fills.

Appropriate documentation, with supporting laboratory test results for proposed fill materials, should be submitted for approval prior to its use. Grain size distribution, maximum dry density, optimum water content determinations, and plasticity of the soil should be performed on representative samples of the proposed Controlled Fill.

Preparation of the subgrade and the placement of fill should be performed under the oversight of a qualified geotechnical engineer, or a technician under their direction. No fill material should be placed in areas where free water is standing, on frozen subgrade areas, or on surfaces which have not been approved by qualified geotechnical personnel.

7.6 Supplemental Construction Services

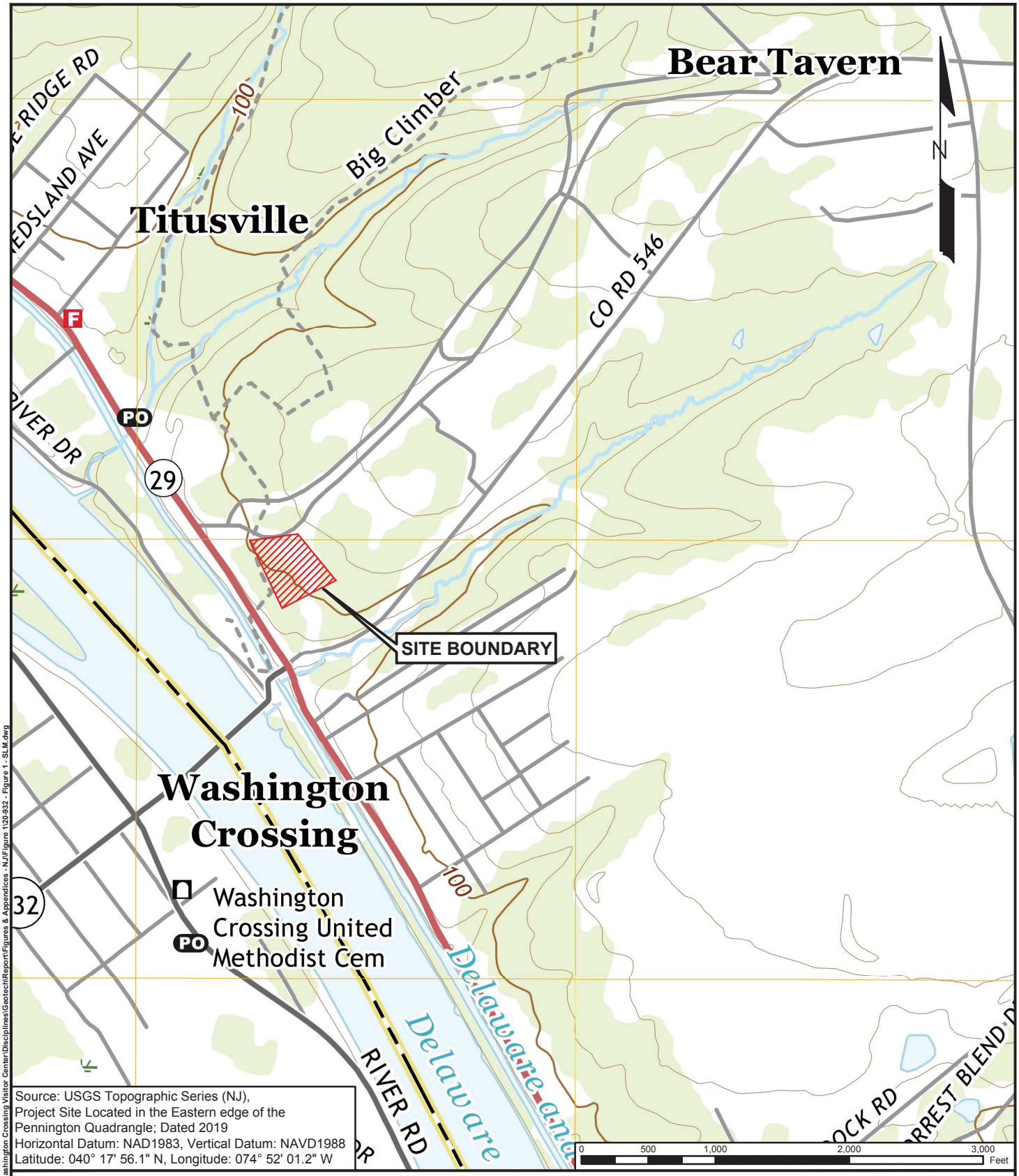
A qualified geotechnical engineer should observe construction and provide testing and consultation as described in previous sections of this report. Monitoring and testing should be performed to verify that suitable materials are used for Controlled Fill, and that they are properly placed and compacted over suitable subgrade soils. The excavated materials and the on-site natural soil to be reused as Controlled Fill shall be approved for reuse by the owner's geotechnical engineer prior to reuse.

8.0 CLOSURE

This report has been prepared to assist DPMC with the proposed design at Washington Crossing State Park in Titusville, New Jersey. The conclusions and recommendations provided within this report were prepared based on our understanding of the project and through the application of generally accepted soils and geotechnical engineering practices and are founded on the information made available to us at the time of the actual writing of the report and the site conditions, surface and subsurface, that existed at the time the exploratory borings were drilled. A further assumption has been made that the limited exploratory borings, in relation both to the area extent of the site and to depth, are representative of general subsurface conditions across the site. Environmental issues (such as potentially contaminated soil and groundwater) are outside the scope of this study and should be addressed in a separate study.

Technical specifications and design drawings should incorporate our recommendations to ensure that subsurface conditions and other geotechnical issues at the site are adequately addressed in the construction documents. No warranties, expressed or implied, are made. Matrix should be notified of any changes to the planned construction or if subsurface conditions differing from those described herein are encountered, so the impact on the geotechnical recommendations can be evaluated.

FIGURES



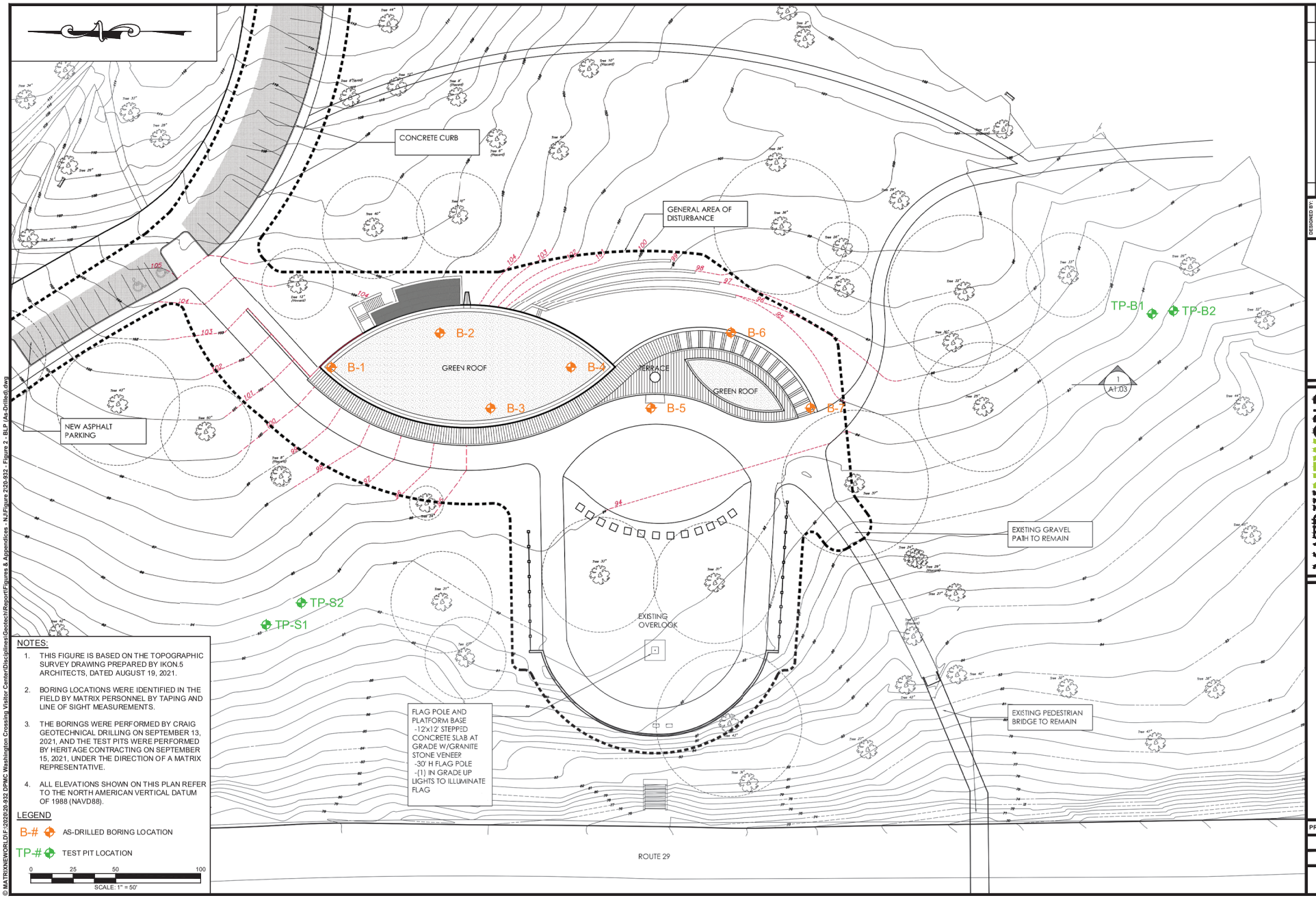
Source: USGS Topographic Series (NJ),
Project Site Located in the Eastern edge of the Pennington Quadrangle; Dated 2019
Horizontal Datum: NAD1983, Vertical Datum: NAVD1988
Latitude: 040° 17' 56.1" N, Longitude: 074° 52' 01.2" W

SITE LOCATION MAP

MATRIXNEWORLD
Engineering Progress
Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
26 Columbia Turnpike
Florham Park, New Jersey 07932
Certified WBE
Tel: 973-240-1800
Fax: 973-240-1818
www.matrixneworld.com

STATE OF NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
WASHINGTON CROSSING STATE PARK NEW VISITOR CENTER
TITUSVILLE, NEW JERSEY 08560

SCALE:	PROJECT NO.:	DATE:	FIGURE NO.:
1" = 1,000'	20-932	SEPTEMBER 2021	1



NOTES:

1. THIS FIGURE IS BASED ON THE TOPOGRAPHIC SURVEY DRAWING PREPARED BY IKON.5 ARCHITECTS, DATED AUGUST 19, 2021.
2. BORING LOCATIONS WERE IDENTIFIED IN THE FIELD BY MATRIX PERSONNEL BY TAPING AND LINE OF SIGHT MEASUREMENTS.
3. THE BORINGS WERE PERFORMED BY CRAIG GEOTECHNICAL DRILLING ON SEPTEMBER 13, 2021, AND THE TEST PITS WERE PERFORMED BY HERITAGE CONTRACTING ON SEPTEMBER 15, 2021, UNDER THE DIRECTION OF A MATRIX REPRESENTATIVE.
4. ALL ELEVATIONS SHOWN ON THIS PLAN REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

LEGEND

B-# AS-DRILLED BORING LOCATION

TP-# TEST PIT LOCATION

0 25 50 100

SCALE: 1" = 50'

NO.	DESCRIPTION	DATE:	BY:	APP:
REVISIONS				

DESIGNED BY: LM

REVIEWED BY: MS

RELEASED BY: MS

MATRIX NEW WORLD Engineering Program
Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
26 Columbia Turnpike
Florham Park, New Jersey 07932
Certified WBE
Tel: 973-240-1800
Fax: 973-240-1818
www.matrixneworld.com
NEW JERSEY CERTIFICATE OF AUTHORIZATION No. 24GA27982300

AS-DRILLED BORING LOCATION PLAN

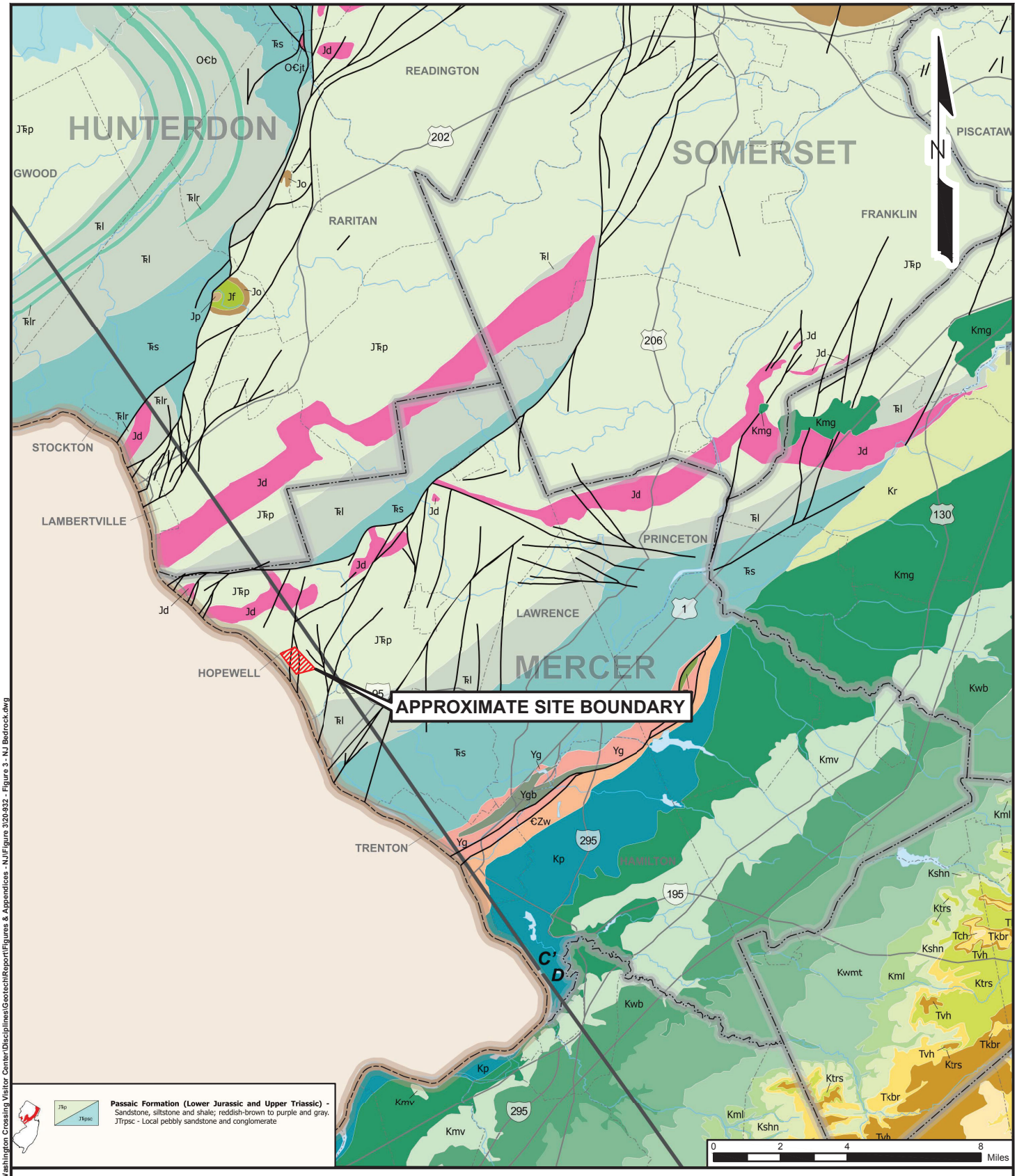
NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
WASHINGTON CROSSING NEW VISITOR CENTER
TITUSVILLE, NEW JERSEY 08560

PROJECT NUMBER: 20-932

SCALE: AS NOTED

DATE: 9-22-2021

2



BEDROCK GEOLOGY LOCATION MAP

MATRIXNEWORLD
Engineering Progress
Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
26 Columbia Turnpike
Florham Park, New Jersey 07932
Certified WBE
Tel: 973-240-1800
Fax: 973-240-1818
www.matrixneworld.com

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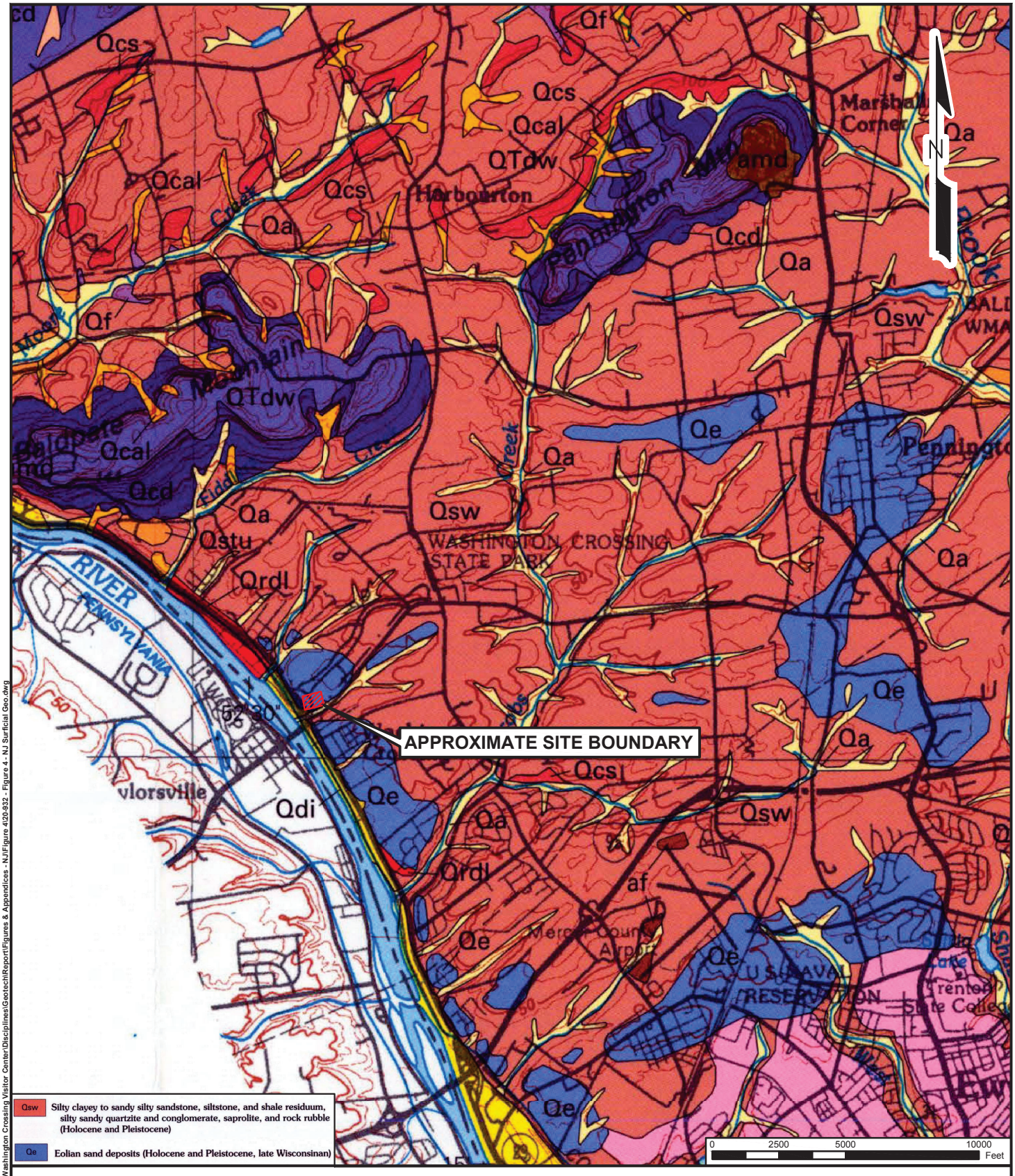
WASHINGTON CROSSING STATE PARK NEW VISITOR CENTER
TITUSVILLE, NEW JERSEY 08560

SCALE:	PROJECT NO.:	DATE:	FIGURE NO.:
1" = 4 Miles	20-932	SEPTEMBER 2021	3



SURFICIAL GEOLOGY LOCATION MAP

MATRIXNEWORLD
Engineering Progress
Matrix New World Engineering, Land Surveying and Landscape Architecture, P.C.
26 Columbia Turnpike
Florham Park, New Jersey 07932
Certified WBE
Tel: 973-240-1800
Fax: 973-240-1818
www.matrixneworld.com

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WASHINGTON CROSSING STATE PARK NEW VISITOR CENTER
TITUSVILLE, NEW JERSEY 08560

SCALE:	PROJECT NO.:	DATE:	FIGURE NO.:
1" = 5000'	20-932	SEPTEMBER 2021	4

APPENDIX A

SOIL BORING LOGS

LOG NOTATION

Sample Classifications

SS = Split Spoon

NR = No Recovery

NX = Rock Core

U = Shelby Tube

REC = Soil Recovery

RQD = Rock Quality Designation

Sand Classifications

c = Coarse

m = Medium

f = Fine

* = Predominant Grain Size

Soil Properties

WC = Water Content

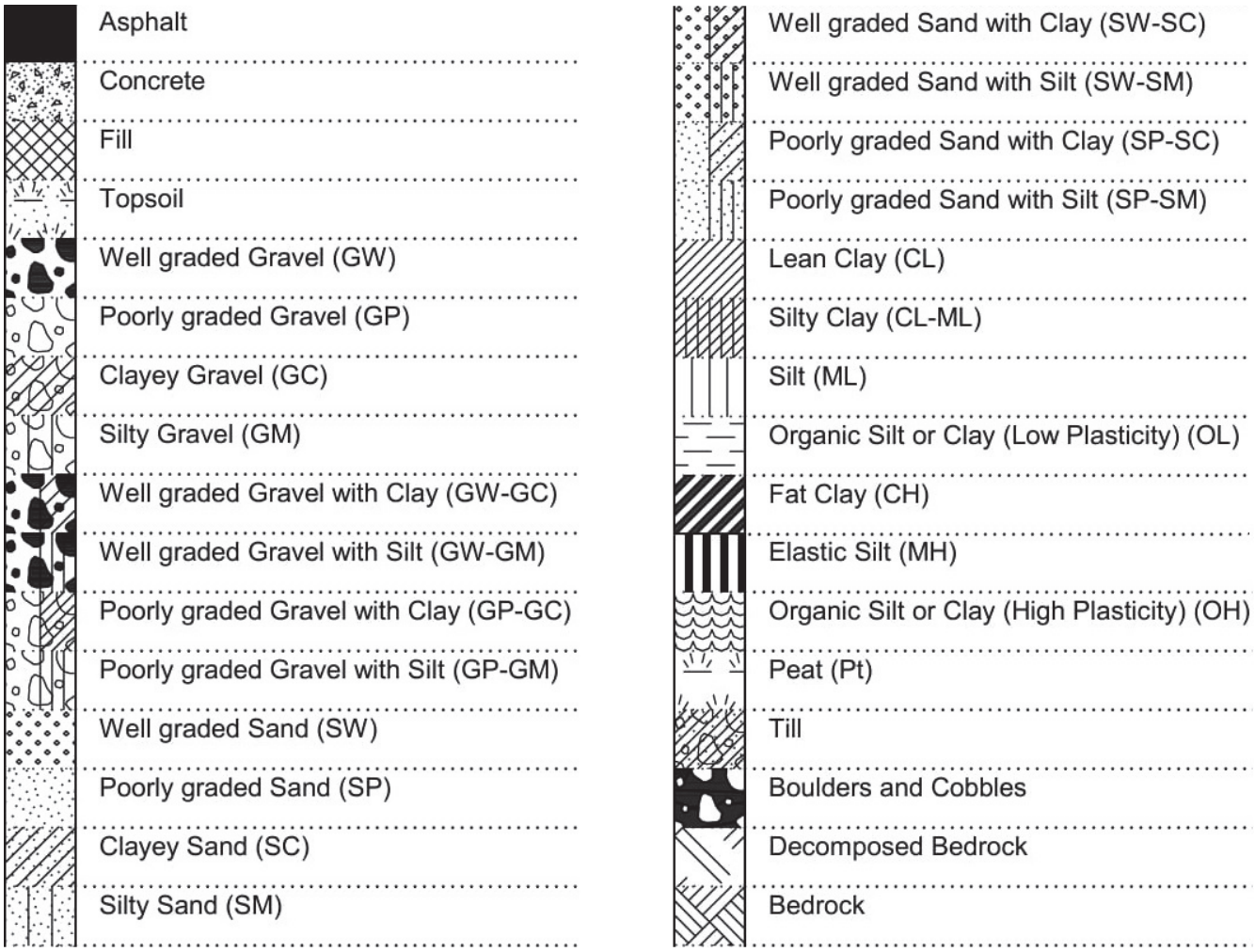
PL = Plastic Limit

LL = Liquid Limit

PI = Plasticity Index

OC = Organic Content

LOG GRAPHICAL LEGEND



MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-1**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**				
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	SAMPLE Type	SAMPLE Depth Feet	SAMPLE Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-1-1-1 (38%)		Topsoil. Brown silty SAND, dry. (SM)	
		2	SS	2-4	1-WOH/12"-12 (50%)		Same as above, dry. (SM)	
5		3	SS	4-6	1-2-1-2 (67%)		Same as above, dry. (SM) WC: 14.0%; Gravel: 0%, Sand: 66%, Fines: 34%; PL: 18, PI: NP	Sieve; Atterberg Limits
		4	SS	6-7.8	16-30-31-60/3" (100%)		4" Same as above, dry. (SM) 17" Decomposed red MUDSTONE, dry.	
				8-8.3	50/3" (0%)		No recovery. Bottom of Borehole @ 8.25 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-2**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**				
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	Type	Depth Feet	Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-1-1-1 (58%)		Topsoil. Brown silty SAND, dry. (SM)	
		2	SS	2-4	1-2-4-4 (71%)		Same as above, dry. (SM)	
5		3	SS	4-6	6-4-4-3 (75%)		Same as above, dry. (SM)	
		4	SS	6-8	2-3-5-8 (67%)		12" Same as above, dry. (SM)	
							4" Decomposed red MUDSTONE, dry.	
		5	SS	8-10	9-13-9-8 (75%)		Same as above, dry.	
10		6	SS	10-11.7	12-6-16-50/1" (61%)		Same as above, dry. WC: 9.3%; Gravel: 35%, Sand: 48%, Fines: 17%	Sieve
15		7	SS	15-16.3	15-20-50/3" (80%)		Same as above, dry.	
							Bottom of Borehole @ 16.25 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

BORING NO.: **B-2**

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-3**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**	**9/13/21**	**10:00 am**	**6 (perched)**	
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	Type	Depth Feet	Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-1-1-1 (54%)		Topsoil. Brown silty SAND, dry. (SM)	
		2	SS	2-4	2-2-5-6 (79%)		Same as above, dry. (SM)	
5		3	SS	4-6	5-6-7-6 (63%)		Same as above, dry. (SM)	
		4	SS	6-8	10-10-7-9 (83%)		4" Same as above, wet. (SM) 16" Decomposed red MUDSTONE, dry.	
		5	SS	8-10	11-18-17-26 (71%)		Same as above, dry.	
10		6	SS	10-12	15-12-10-6 (58%)		Same as above, dry. WC: 7.8%, Gravel: 53%, Sand: 35%, Fines: 12%	Sieve
		7	SS	12-14	6-8-8-16 (50%)		Same as above, dry.	
15								
		8	SS	17-18.5	22-16-50/5.5" (78%)		Same as above, dry.	
							Bottom of Borehole @ 18.5 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

BORING NO.: **B-3**

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-4**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**	**9/13/21**	**9:30 am**	**5.5 (perched)**	
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	SAMPLE Type	SAMPLE Depth Feet	SAMPLE Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-1-1-1 (58%)		Topsoil. Brown SILT, dry. (ML)	
		2	SS	2-4	WOH/18"-1 (50%)		Same as above, dry. (ML)	
5		3	SS	4-6	1-1-2-2 (50%)		Same as above, dry, bottom 4" wet. (ML) WC: 22.6%; Gravel: 0.1%, Sand: 41.9%, Fines: 58%; LL: 21, PL: 20, PI: 1	Sieve; Atterberg Limits
		4	SS	6-8	9-12-19-19 (83%)		Decomposed red MUDSTONE, dry.	
		5	SS	8-10	13-20-35-50 (67%)		Same as above, dry.	
10		6	SS	10-11.5	32-38-50/5" (50%)		Same as above, dry.	
							Bottom of Borehole @ 11.5 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

BORING NO.: **B-4**

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-5**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**				
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	SAMPLE Type	SAMPLE Depth Feet	SAMPLE Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	2-2-2-1 (71%)		Topsoil.	
							Brown SILT, dry. (ML)	
		2	SS	2-4	1-1-2-2 (71%)		Brown SILT, trace f Sand, dry. (ML)	
		3	SS	4-5.9	3-4-18-50/5" (88%)		11" Same as above, dry. (ML)	
5							9" Decomposed red MUDSTONE, dry.	
		4	SS	6-6.3	50/4" (100%)		Same as above, dry.	
							Bottom of Borehole @ 6.33 ft.	

BORING NO.: **B-5**

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-6**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**				
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	Type	Depth Feet	Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-1-1-1 (58%)		Topsoil. Brown SILT, dry. (ML)	
		2	SS	2-4	1-1-2-3 (63%)		Same as above, dry. (ML)	
		3	SS	4-6	5-6-8-17 (92%)		9" Same as above, dry. (ML)	
5							13" Decomposed red MUDSTONE, dry.	
		4	SS	6-8	32-24-38-42 (67%)		Same as above, dry. WC: 14.5%; Gravel: 33%, Sand: 27%, Fines: 40%	Sieve
		5	SS	8-8.5	50/5.5" (83%)		Same as above, dry.	
10				10-10	50/0"		Bottom of Borehole @ 10 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

BORING NO.: **B-6**

MATRIXNEWORLD
Engineering Progress

BORING LOG

BORING NO.: **B-7**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/13/21**

PROJECT LOCATION: **Titusville, NJ 08560** BORING LOCATION:

DRILLING EQUIPMENT: **CME 850** ANGLE: **-90.0** DIR.: **------** ELEV.: DATUM:

DRILLING CONTRACTOR: **Craig Geotechnical Drilling Co. Inc.** DRILLER: **Mark Kier** INSPECTOR: **L. Martin**

CASING and HAMMER				SAMPLER and HAMMER				GROUNDWATER LEVELS			
Type	I.D.	Weight	Drop	Type	I.D.	Weight	Drop	Date	Time	Depth	Casing Depth
Auto		**140 lbs**	**30"**	**AUTO**		**140 lbs**	**30"**				
FJ Steel	**4**			**SPLIT SPOON**	**1 3/8"**						

Depth Feet (Elev.)	CASING Blows/ Foot	SAMPLE No.	Type	Depth Feet	Blows/6" (REC. %) [RQD %]	Graphic Symbol	Description Of Material	Laboratory Tests
		1	SS	0-2	1-3-3-3 (79%)		Topsoil. Brown silty SAND with gravel (SM)	
		2	SS	2-4	2-1-2-2 (63%)		Same as above, dry. (SM)	
5		3	SS	4-6	1-2-8-7 (71%)		16" Same as above, dry. (SM) WC: 13.2%; Gravel: 19%, Sand: 54%, Fines: 27%, PL: 17, PI: NP	Sieve; Atterberg Limits
		4	SS	6-6.5	50/5" (17%)		1" Decomposed red MUDSTONE, dry. Same as above, dry.	
				8-8	50/0"		Bottom of Borehole @ 8 ft.	

NEWORLD NO GROUT 20-932 BORING LOGS 11-9-21.GPJ MATRIX EGS.GDT 11/9/21

BORING NO.: **B-7**

MATRIXNEWORLD
Engineering Progress

TEST PIT LOG

TEST PIT NO.: **TP-B1**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/15/2021**

PROJECT LOCATION: **Titusville, NJ 08560** ELEV.: TIME STARTED:

TEST PIT LOCATION: **Potential stormwater basin** DATUM: TIME FINISHED:

CONTRACTOR: **Heritage** GROUNDWATER LEVEL (IN): **Not encountered**

EQUIPMENT: **CAT 308C** OPERATOR: **Chris Sigle** INSPECTOR: **L. Martin**

Depth Inches (Elev)	No.	Depth Inches	Graphic Symbol	Description Of Material	Laboratory Tests
5				Topsoil.	
10				Brown silty SAND (SM)	
85				Reddish brown decomposed MUDSTONE. Silt, cmf Sand, cmf Gravel, and cobble size pieces.	
175				Bottom of Test pit @ 175 in. Test Pit Backfilled.	

TEST PIT INCH 20-932 TEST PIT LOGS 10-26-21.GPJ MATRIX EGS.GDT 11/9/21

MATRIXNEWORLD
Engineering Progress

TEST PIT LOG

TEST PIT NO.: **TP-B2**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/15/2021**

PROJECT LOCATION: **Titusville, NJ 08560** ELEV.: TIME STARTED:

TEST PIT LOCATION: **Potential stormwater basin** DATUM: TIME FINISHED:

CONTRACTOR: **Heritage** GROUNDWATER LEVEL (IN): **Not encountered**

EQUIPMENT: **CAT 308C** OPERATOR: **Chris Sigle** INSPECTOR: **L. Martin**

Depth Inches (Elev)	No.	Depth Inches	Graphic Symbol	Description Of Material	Laboratory Tests
5				Topsoil.	
10				Brown silty SAND (SM)	
15					
20					
25					
30					
35					
40					
45					
50					
55					
60					
65				Permeability rate at 5 feet: 7.88 in/hr.	
70					
75					
80					
85					
90				Reddish brown decomposed MUDSTONE. Silt, cmf Sand, cmf Gravel, and cobble size pieces.	
95					
100					
105					
110					
115					
120					
125					
130					
135					
140					
145					
150					
155					
160					
165					
170					
175					
180					
				Bottom of Test pit @ 180 in. Test Pit Backfilled.	

TEST PIT INCH 20-932 TEST PIT LOGS 10-26-21.GPJ MATRIX EGS.GDT 11/9/21

MATRIXNEWORLD
Engineering Progress

TEST PIT LOG

TEST PIT NO.: **TP-S1**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/15/2021**

PROJECT LOCATION: **Titusville, NJ 08560** ELEV.: TIME STARTED:

TEST PIT LOCATION: **Septic field option 1** DATUM: TIME FINISHED:

CONTRACTOR: **Heritage** GROUNDWATER LEVEL (IN): **125**

EQUIPMENT: **CAT 308C** OPERATOR: **Chris Sigle** INSPECTOR: **L. Martin**

Depth Inches (Elev)	No.	Depth Inches	Graphic Symbol	Description Of Material	Laboratory Tests
5				Topsoil.	
10				Brown silty SAND (SM)	
85				Reddish brown decomposed MUDSTONE. Silt, cmf Sand, cmf Gravel, and cobble size pieces.	
125 ▼				Groundwater pooled at 10 ft 5 in. Bottom of Test pit @ 126 in. Test Pit Backfilled.	

TEST PIT INCH 20-932 TEST PIT LOGS 10-26-21.GPJ MATRIX EGS.GDT 11/9/21

TEST PIT NO.: **TP-S1**

MATRIXNEWORLD
Engineering Progress

TEST PIT LOG

TEST PIT NO.: **TP-S2**

SHEET **1** OF **1**

PROJECT NO.: **20-932** PROJECT: **DPMC Washington Crossing Visitor Center** DATE: **9/15/2021**

PROJECT LOCATION: **Titusville, NJ 08560** ELEV.: TIME STARTED:

TEST PIT LOCATION: **Septic field option 1** DATUM: TIME FINISHED:

CONTRACTOR: **Heritage** GROUNDWATER LEVEL (IN): **128**

EQUIPMENT: **CAT 308C** OPERATOR: **Chris Sigle** INSPECTOR: **L. Martin**

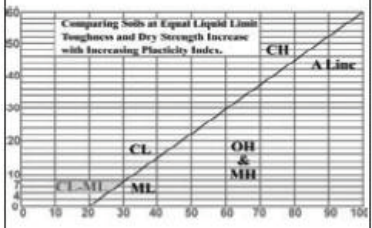
Depth Inches (Elev)	No.	Depth Inches	Graphic Symbol	Description Of Material	Laboratory Tests
5				Topsoil.	
10				Brown silty SAND (SM)	
15					
20					
25					
30					
35					
40				Brown silty SAND (SM)	
45					
50	S-1	48		Sandy Loam Permeability Class Rating: K2 WC: 11.3%, Gravel: 0.2%, Sand: 75%, Silt: 18.8%, Clay: 6%	
55					
60					
65	S-2	60		Sandy Loam Permeability Class Rating: K2 WC: 16.5%, Gravel: 34%, Sand: 40%, Silt: 19%, Clay: 7%	
70					
75				Reddish brown decomposed MUDSTONE. Silt, cmf Sand, cmf Gravel, and cobble size pieces.	
80					
85					
90	S-3	86		Loam Permeability Class Rating: K1 WC: 12.5%, Gravel: 68%, Sand: 17.5%, Silt: 11%, Clay: 3.5%	
95					
100					
105					
110					
115					
120					
125					
130 ▼				Groundwater pooled at 10 ft 8 in.	
				Bottom of Test pit @ 130 in. Test Pit Backfilled.	

TEST PIT INCH 20-932 TEST PIT LOGS 10-26-21.GPJ MATRIX EGS.GDT 11/9/21

TEST PIT NO.: **TP-S2**

APPENDIX B

SOIL CLASSIFICATION TABLES

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES	FIELD IDENTIFICATION PROCEDURES (EXCLUDING PARTICLES LARGER THAN 3 IN. AND BASING FRACTIONS ON ESTIMATED WEIGHTS)			INFORMATION REQUIRED FOR DESCRIBING SOILS	LABORATORY CLASSIFICATION CRITERIA
1	2		3	4	5			6	7
Coarse-grained Soils More than half of material is larger than No. 200 sieve size. The No. 200 sieve size is about the smallest visible to the naked eye.	Gravels More than half of coarse fraction is larger than No. 4 sieve size. (For visual classification, the 1/4-in. size may be used as equivalent to the No. 4 sieve size.)	Clean Gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixture, little or no fines.	Wide range in grain size and substantial amounts of all intermediate particle sizes.			For undisturbed soils add information on stratification, degree of compactness, cementation, moisture condition, and drainage characteristics.	Use grain-size curve in identifying the fractions as given under field identification. Determine percentage of gravel and sand from grain-size curve. Depending on percentage of fine (fraction smaller than No. 200 sieve size) coarse-grained soils are classified as follows: Less than 5% GW, GP, SW, SP. More than 12% GM, GC, SM, SC. 5% to 12% Borderline cases requiring use of dual symbols. $C_u = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			GP	Poorly graded gravels or gravel-sand mixture, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.				Not meeting all gradation requirements for GW
		Gravels with Fines (Appreciable amount of fines)	GM	Silty gravels, gravel and silt mixtures.	Nonplastic fines or fines with low plasticity (for identification procedures see ML below).			Give typical name; indicate approximate percentages of sand and gravel, maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbol in parentheses.	Atterberg limits below "A" line or P1 less than 4
			GC	Clayey gravels, gravel and clay mixtures.	Plastic fines (for identification procedures see CL below).				Atterberg limits above "A" line with P1 greater than 7
									Above "A" line with P1 between 4 and 7 are borderline cases requiring use of dual symbols.
	Sands More than half of coarse fraction is smaller than No 4 sieve size.	Clean Sand (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.	Wide range in grain size and substantial amounts of all intermediate particle sizes.				$Cu = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3
			SP	Poorly graded sands or gravelly sands, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.			Example: Silty sand, gravelly; about 20% hard, angular gravel particles 1/2-in. maximum size; rounded and subangular sand grains, coarse to fine; about 15% nonplastic fines with low dry strength; well compacted and moist in place; alluvial sand; (SM).	Not meeting all gradation requirements for SW
		Sands with Fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.	Nonplastic fines or fines with low plasticity (for identification procedures see ML below).				Atterberg limits above "A" line or P1 less than 4
			SC	Clayey sands, sand-clay mixtures.	Plastic fines (for identification procedures see CL below).				Atterberg limits above "A" line with Pl greater than 7
									Limits plotting in hatched zone with P1 between 4 and 7 are borderline cases requiring use of dual symbols.
					Identification Procedure on Fraction Smaller than No. 40 Sieve Size.				
					Dry Strength (Crushing Characteristics)	Dilatancy (Reaction to shaking)	Toughness (Consistency near PL)		
Fine-grained Soils More than half of material is smaller than No. 200 sieve size.	Silts and Clays Liquid limit is less than 50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.	None to slight	Quick to slow	None	For undisturbed soils add information on structure, stratification, consistency in undisturbed and remolded states, moisture and drainage conditions	Plasticity Index — LIQUID LIMIT PLASTICITY CHART For laboratory classification of fine-grained soils 
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Medium to high	None to very slow	Medium		
	Silts and Clays Liquid limit is greater than 50		OL	Organic silts and organic silty clays of low plasticity.	Slight to medium	Slow	Slight	Give typical name; indicate degree and character of plasticity; amount and maximum size of coarse grains; color in wet condition; odor, if any; local or geologic name and other pertinent descriptive information; and symbol in parentheses.	
			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	Slight to medium	Slow to none	Slight to medium		
			CH	Inorganic clays of high plasticity, fat clays.	High to very high	None	High		
			OH	Organic clays of medium to high plasticity, organic silts.	Medium to high	None to very slow	Slight to medium	Example: Clayey silt, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (ML)	
Highly Organic Soils			Pt	Peat and other highly organic soils.	Readily identified by color, odor, spongy feel and frequently by fibrous texture				

1. Boundary classifications: Soils possessing characteristics of two groups are designed by combinations of group symbols. For example GM-GC, well-graded gravel-sand mixture with clay binder.
2. All sieve sizes on this chart are U.S. standard.
3. Adopted by Corps of Engineers and Bureau of Reclamation, January 1952.

032058C

BURMISTER SOIL IDENTIFICATION METHOD

BURMISTER SOIL IDENTIFICATION METHOD

1. SOIL MATERIAL — Composition, Gradation, and Plasticity Characteristics

a) Soil Components and Soil Fractions

Sieve	3"	1"	3/8"	No. 10	No. 30	No. 60	No. 200	
				2 mm			0.076 mm	0.02 mm
Granular Component Fractions	GRAVEL			SAND			SILT	
	coarse	medium	fine	coarse	medium	fine	coarse	fine
Clay Soil Components							CLAY-SOIL Defined and Named on a Plasticity Basis	

b) Identifying Terms for Granular Soils
Composition and Proportion Terms for Components

Component		Proportion Terms	Defining Range of Percentages
Principal Components- GRAVEL, SAND, SILT (all Uppercase)			50% or more
Minor Components-	Gravel	and	35 to 50%
	Sand	some	20 to 35%
	Silt	little	10 to 20%
		trace	1 to 10%

Gradation Terms for Granular Soils		ORGANIC SOILS
coarse to fine	all fractions more than 10%	Plasticity Basis, as
coarse to medium	fine less than 10%	
medium to fine	coarse less than 10%	Organic SILT, H. PI
medium	coarse and fine less than 10%	
fine	coarse and medium less than 10%	Organic SILT, L. PI

PLUS or MINUS signs used to indicate upper or lower limits.

c) Identifying Terms for CLAY SOILS. Plasticity Basis for Combined Silt and Clay Components, Expressing the Relative Dominance of Clay

Overall Plasticity	Plasticity Index	Principal Component	Minor Component
Non-Plastic	0	SILT	Silt
Slight	1 to 5	Clayey SILT	Clayey Silt
Low	5 to 10	SILT & CLAY	Silt & Clay
Medium	10 to 20	CLAY & SILT	Clay & Silt
High	20 to 40	Silty CLAY	
Very High	more than 40	CLAY	

Example: Soil 60% coarse to fine Sand, 25% medium to fine Gravel, 15% Clayey Silt and color-brown.
Identification: Br. coarse to fine SAND, some medium to fine Gravel, little Clayey Silt.

References: 1) D. M. Burmister, "Principles and Techniques of Soil Identification" 29th Highway Research Board Proceedings, 1949.
2) "Identification and Classification of Soils – An appraisal and Statement of Principles", ASTM Special Technical Publication No. 113, 1951.

Field Classification of Soil Using the USCS

Apparent Density of Coarse-Grained Soils

SPT N-Value (corrected)	Apparent Density
0 - 4	Very loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
> 50	Very Dense

Consistency of Fine-Grained Soils

SPT N-Value (uncorrected)	Consistency	Compressive Strength (ksf)	Results of Manual Manipulation
< 2	Very Soft	< 0.5	Specimen (height = twice the diameter) sags under its own weight; extrudes between fingers when squeezed
3 - 4	Soft	> 0.5 - 1.0	Speciment can be pinched in to between the thumb and forefinger; remolded by light finger pressure
5 - 8	Medium stiff	> 1.0 - 2.0	Can be imprinted easily with fingers; remolded by strong finger pressure
9 - 15	Stiff	> 2.0 - 4.0	Can be imprinted with considerable pressure from fingers or indented by thumbnail
16 - 30	Very stiff	> 4.0 - 8.0	Can be barely imprinted by pressure from the fingers or indented by thumbnail
> 30	Hard	> 8.0	Cannot be imprinted by fingers or difficult to indent by thumbnail

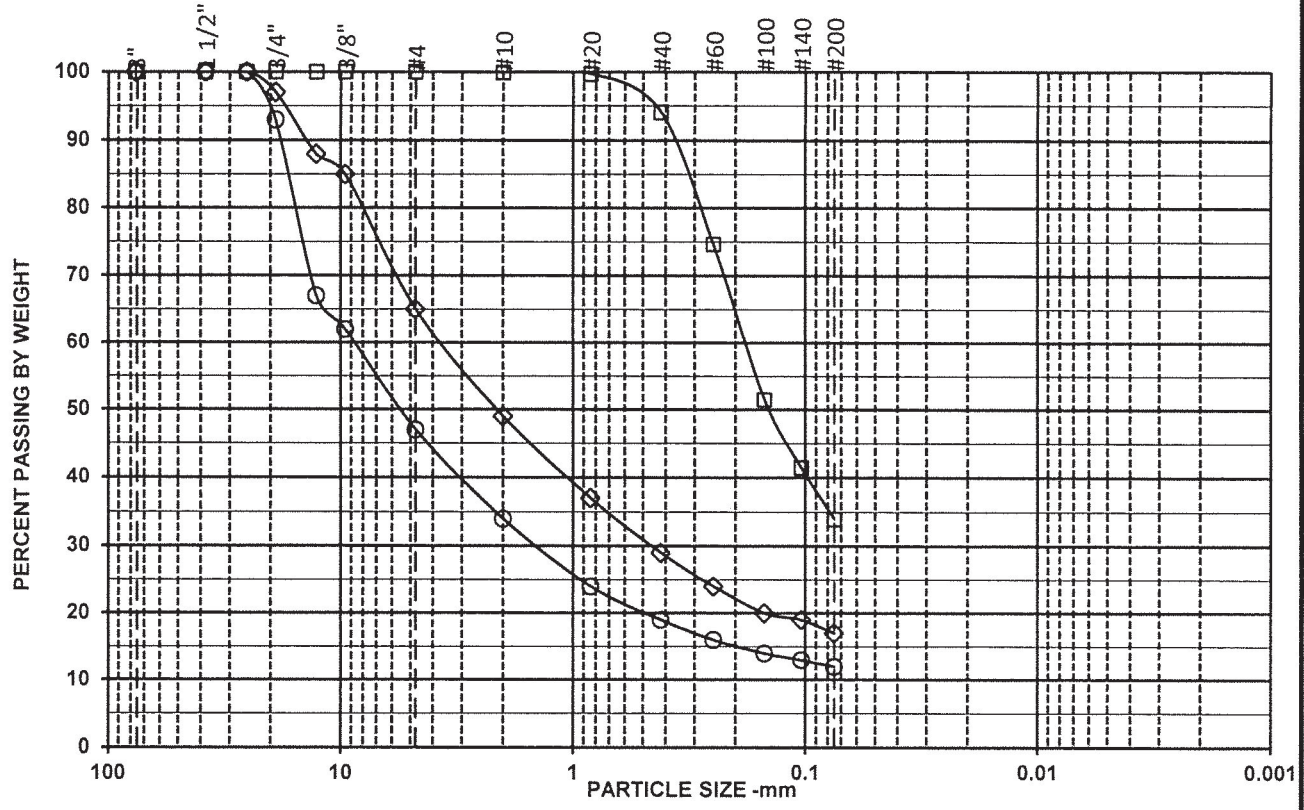
APPENDIX C

RESULTS OF GEOTECHNICAL LABORATORY TESTING

Matrix New World Engineering, P.C. #20-932
DPMC Washington Crossing Visitor Center
LABORATORY TESTING DATA SUMMARY

BORING NO.	SAMPLE NO.	REPLICATE	DEPTH (ft)	IDENTIFICATION TESTS									REMARKS
				WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDROMETER % MINUS 2 μm (%)	TEXTURAL CLASSIFICATION	PERMEABILITY CLASS RATING	
B-1	S-3		4-6	14.0	-	18	NP	SM	34				
B-2	S-6		10-12	9.3				SC	17				
B-3	S-6		10-12	7.8				GP-GM	12				
B-4	S-3		4-6	22.6	21	20	1	ML	58				
B-6	S-4		6-8	14.5				GC	40				
B-7	S-3		4-6	13.2	-	17	NP	SM	27				
TP-2	S-1	A	4	11.3				SM	40.3	5	Sandy Loam	K2	
TP-2	S-1	B	4	11.9				SM	39.6	7	Sandy Loam	K2	
TP-2	S-2	A	5	16.3				SM	36	7	Sandy Loam	K2	
TP-2	S-2	B	5	16.6				SM	36	7	Sandy Loam	K2	
TP-2	S-3	A	7.2	12.8				GM	21	4	Loam	K1	
TP-2	S-3	B	7.2	12.1				GM	17	3	Loam	K1	

Note: (1) USCS symbol based on visual observation and Sieve and Atterberg limits reported.



Open Symbols: Sieve analysis by ASTM D6913
Filled symbols: Hydrometer analysis by ASTM D7928 corrected for complete sample

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	14.0	-	18	NP	SM		Brown, Silty sand	09/30/21
◇	9.3				SC		Dark reddish brown, Clayey sand with gravel shale noted, Insufficient sample size	09/30/21
○	7.8				GP-GM		Dark reddish brown, Poorly graded gravel with silt and sand shale noted, Insufficient sample size	09/30/21

Matrix New World Engineering, P.C. #20-932

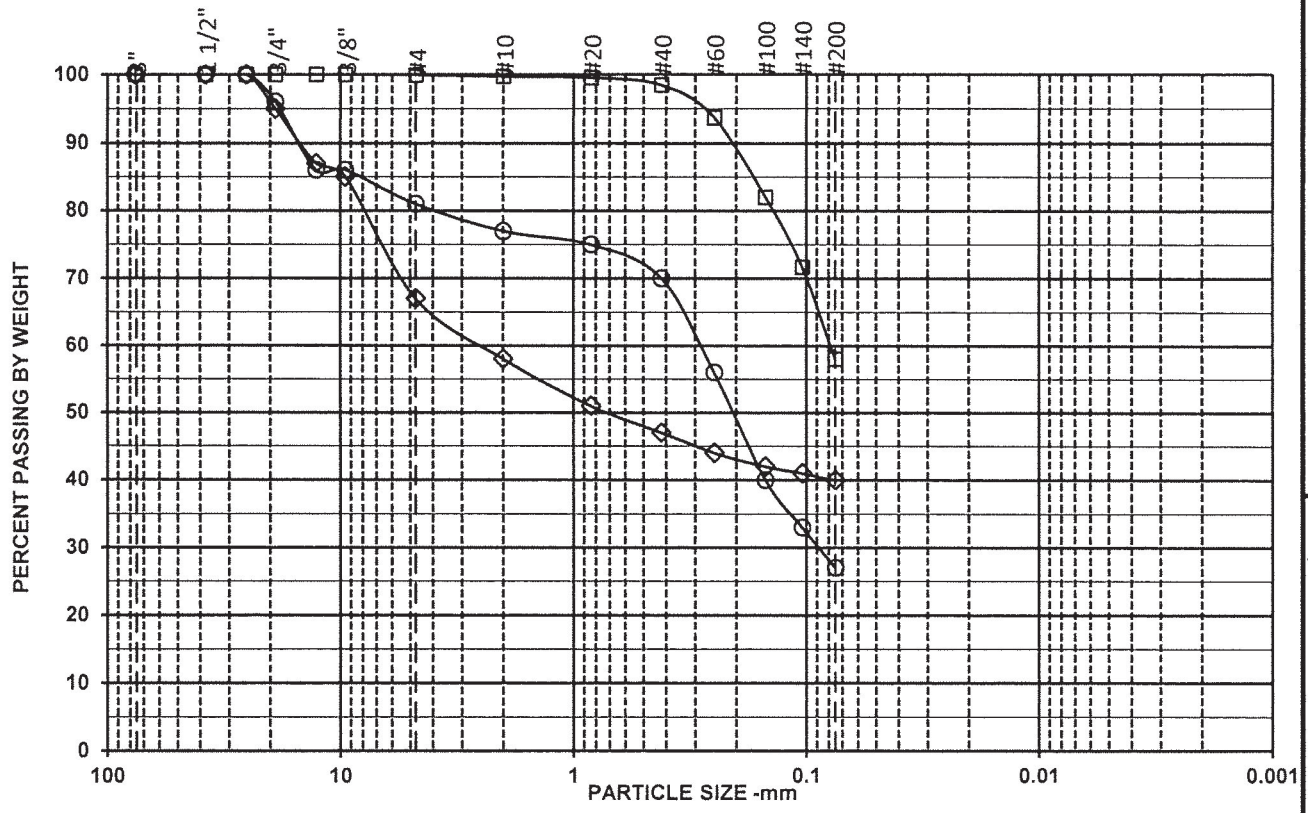
TerraSense #21005948A

DPMC Washington Crossing Visitor Center

Symbol	□	◇	○
Boring	B-1	B-2	B-3
Sample	S-3	S-6	S-6
Depth	4-6	10-12	10-12
% +3"	0	0	0
% Gravel	0	35	53
% SAND	66	48	35
%C SAND	0.1	16	13
%M SAND	5.8	20	15
%F SAND	60.1	12	7
% FINES	34	17	12
D_{100} (mm)	4.75	25.4	25.4
D_{60} (mm)	0.18	3.62	8.68
D_{30} (mm)		0.46	1.4
D_{10} (mm)			
Cc			
Cu			

Sieve Size/ID #	Percent Finer Data		
6"	100.0	100	100
4"	100.0	100	100
3"	100.0	100	100
1 1/2"	100.0	100	100
1"	100.0	100	100
3/4"	100.0	97	93
1/2"	100.0	88	67
3/8"	100.0	85	62
#4	100.0	65	47
#10	99.9	49	34
#20	99.7	37	24
#40	94.1	29	19
#60	74.7	24	16
#100	51.5	20	14
#140	41.5	19	13
#200	34.0	17	12
5μ m			
2μ m			
1μ m			

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928



Open Symbols: Sieve analysis by ASTM D6913
Filled symbols: Hydrometer analysis by ASTM D7928 corrected for complete sample

SYMBOL	w (%)	LL	PL	PI	USCS	AASHTO	USCS DESCRIPTION AND REMARKS	DATE
□	22.6	21	20	1	ML		Brown, Sandy silt	09/30/21
◇	14.5				GC		Dark reddish brown, Clayey gravel with sand shale noted, Insufficient sample size	09/30/21
○	13.2		17	NP	SM		Brown, Silty sand with gravel shale noted, Insufficient sample size	09/30/21

Matrix New World Engineering, P.C. #20-932

TerraSense #21005948A

DPMC Washington Crossing Visitor Center

Symbol	□	◇	○
Boring	B-4	B-6	B-7
Sample	S-3	S-4	S-3
Depth	4-6	6-8	4-6
% +3"	0	0	0
% Gravel	0.1	33	19
% SAND	41.9	27	54
%C SAND	0.2	9	4
%M SAND	1.3	11	7
%F SAND	40.4	7	43
% FINES	58	40	27
D_{100} (mm)	9.53	25.4	25.4
D_{60} (mm)	0.0787	2.42	0.289
D_{30} (mm)			0.088
D_{10} (mm)			
Cc			
Cu			

Sieve Size/ID #	Percent Finer Data		
6"	100.0	100	100
4"	100.0	100	100
3"	100.0	100	100
1 1/2"	100.0	100	100
1"	100.0	100	100
3/4"	100.0	95	96
1/2"	100.0	87	86
3/8"	100.0	85	86
#4	99.9	67	81
#10	99.7	58	77
#20	99.5	51	75
#40	98.4	47	70
#60	93.7	44	56
#100	82.0	42	40
#140	71.7	41	33
#200 5μ m	58.0	40	27
2μ m			
1μ m			

PARTICLE SIZE DISTRIBUTION
ASTM D6913 & ASTM D7928

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Form 3c. Soil Permeability Class Rating Data

1. Project Number 20-932 Replicate (Letter) A

2. Sample Depth 4 Soil Pit/Boring Number TP-2 Sample S-1

3. Coarse Fragment Content:

Total Weight of Sample, WT, grams	90.44
Weight of Material Retained on 2mm sieve, WCF, grams	0.18
Wt. % Coarse Fragments (W.C.F. / W.T. x 100)	0.2

4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.:	39.24
5. Hydrometer Calibration, Rc:	6.25
6. Hydrometer Reading -- 40 seconds, grams, R1:	18.25
Temperature of suspension. °F	71
7. Corrected Hydrometer Reading, grams, R1':	12.6
8. Hydrometer Reading -- 2 hours, grams, R2:	8.962
Temperature of suspension. °F	70
9. Corrected Hydrometer Reading, grams, R2':	3.1
10. % Sand = (Wt. - R1')/Wt. x 100 =	68%
11. % Clay = R2'/Wt. x 100 =	8%

12. Sieve Analysis:

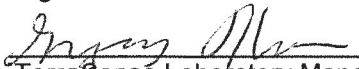
a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction	29.57
b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams	23.06
c. % Fine Plus Very Fine Sand (b/a)	78%

13. Soil Morphology (Natural Soil Samples Only):
Structure of Soil Horizon Tested
Consistence of Soil Horizon Tested: Dry: Moist:

14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples) K2

15. I hereby certify that the information furnished on Form 3c of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-A et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator — Date



10/14/2021

TerraSense Laboratory Manager, Totowa, NJ

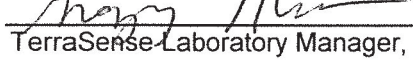
Signature of Professional Engineer — License #

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Form 3c. Soil Permeability Class Rating Data

1. Project Number 20-932 Replicate (Letter) B
2. Sample Depth 4-Jan Soil Pit/Boring Number TP-2 Sample S-1
3. Coarse Fragment Content:
   - Total Weight of Sample, WT, grams: 91.68
   - Weight of Material Retained on 2mm sieve, WCF, grams: 0.18
   - Wt. % Coarse Fragments (W.C.F. / W.T. x 100): 0.2
4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.: 39.82
5. Hydrometer Calibration, Rc: 6.25
6. Hydrometer Reading -- 40 seconds, grams, R1: 18.25
   - Temperature of suspension. °F: 71
7. Corrected Hydrometer Reading, grams, R1': 12.6
8. Hydrometer Reading -- 2 hours, grams, R2: 9.462
   - Temperature of suspension. °F: 70
9. Corrected Hydrometer Reading, grams, R2': 3.6
10. % Sand = (Wt. - R1')/Wt. x 100 = 68%
11. % Clay = R2'/Wt. x 100 = 9%
12. Sieve Analysis:
    - a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction: 29.85
    - b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams: 22.76
    - c. % Fine Plus Very Fine Sand (b/a): 76%
13. Soil Morphology (Natural Soil Samples Only):
    - Structure of Soil Horizon Tested
    - Consistence of Soil Horizon Tested: Dry: Moist:
14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples): K2
15. I hereby certify that the information furnished on Form 3c of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-A et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

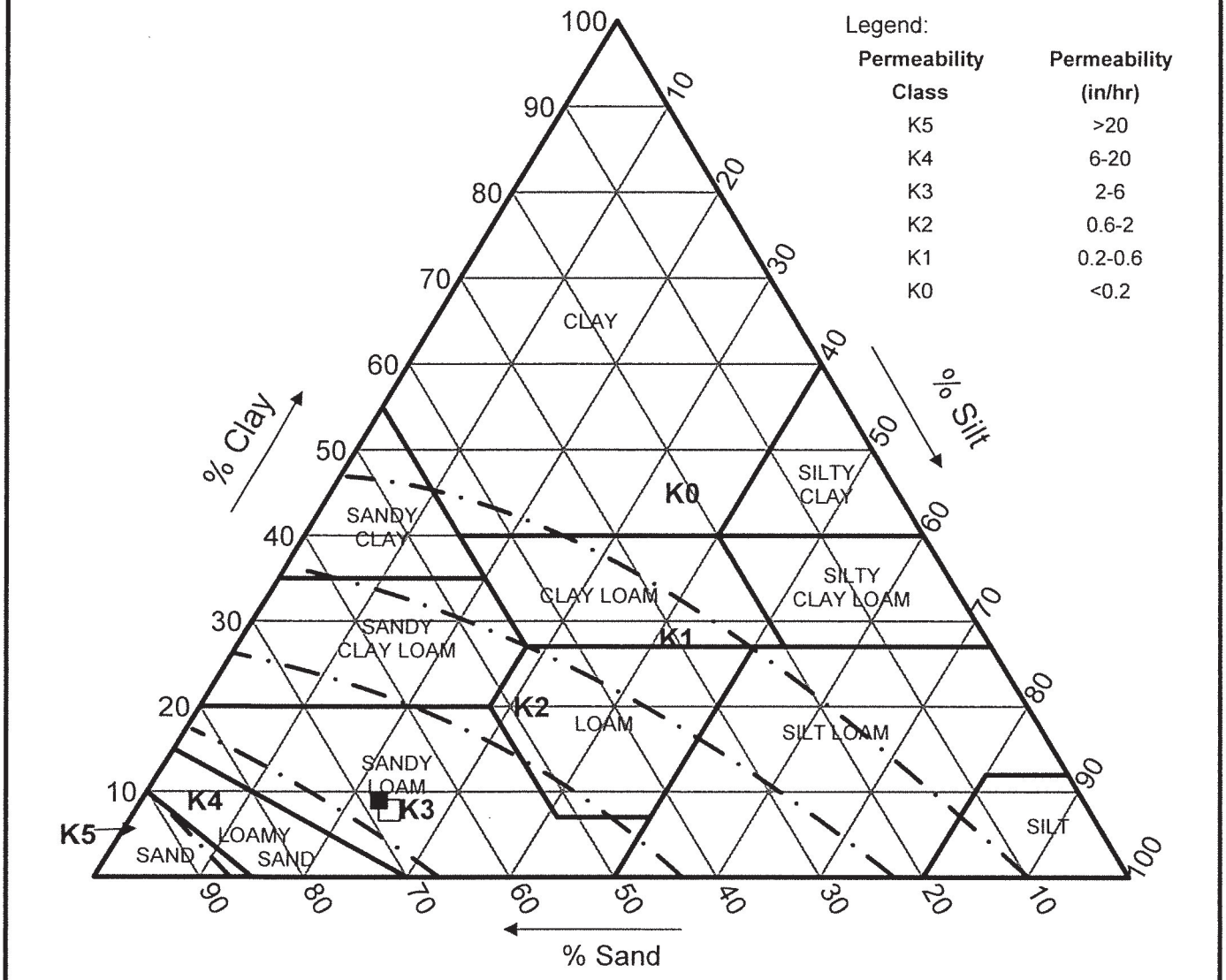
Signature of Soil Evaluator — Date



10/14/2021

TerraSense Laboratory Manager, Totowa, NJ

Signature of Professional Engineer — License #



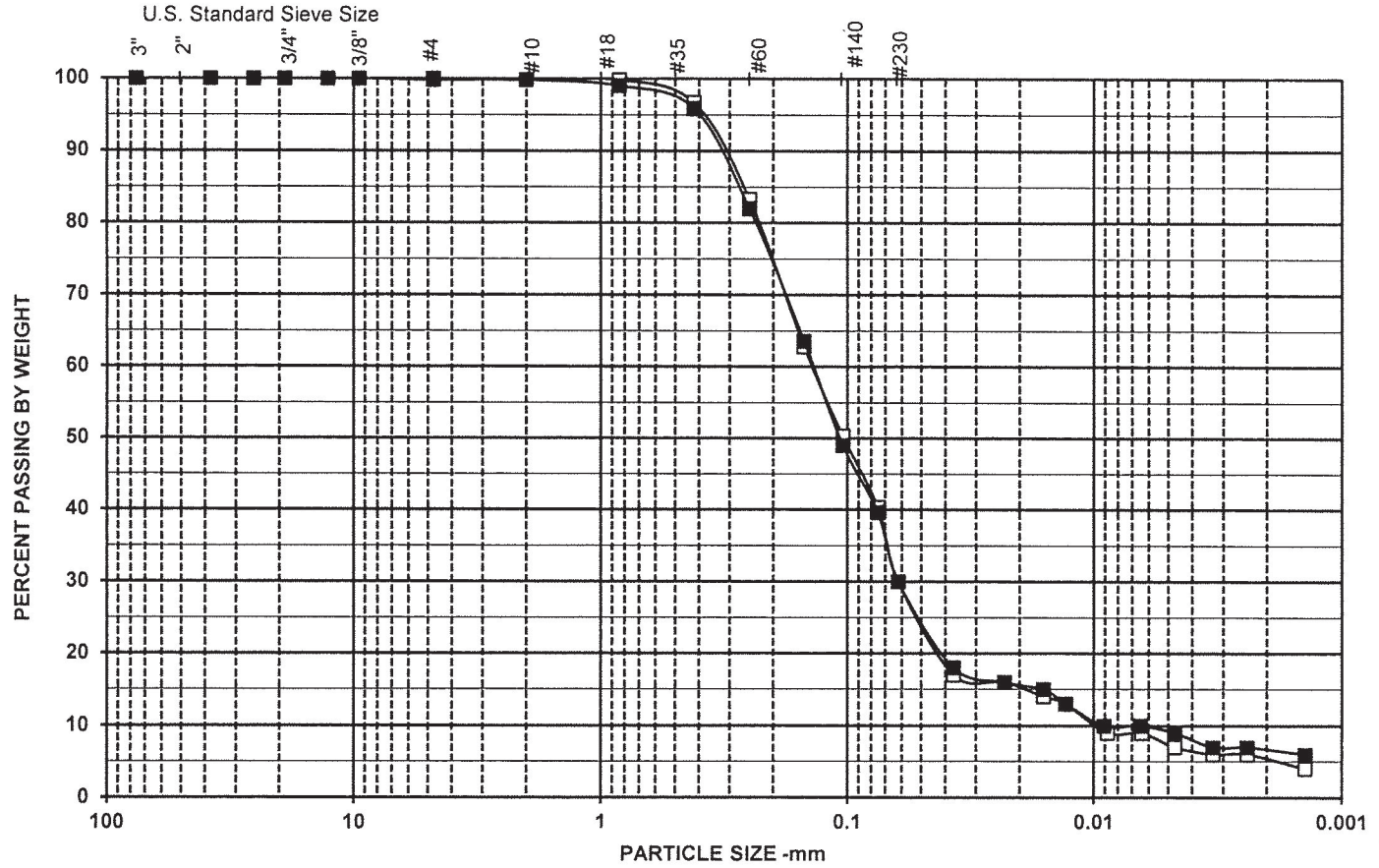
Symbol	Boring Sample	REPLICATE	Normalized Values % Sand	% Clay	% Silt	Permeability Class Rating measured	corrected*	USDA Textural Classification
□	TP-2 S-1	A	67.8	7.8	24.4	K3	K2	Sandy Loam
■	TP-2 S-1	B	68.2	9.0	22.8	K3	K2	Sandy Loam

*as corrected for very fine sand component

Matrix New World Engineering, P.C. Project # 20-932	**DPMC Washington Crossing Visitor Center Mercer County Titusville, NJ**	**Soil Permeability / Textural Triangle by Permeability Class Rating Test**
TerraSense Project # 21005948A		

USDA CLASSIFICATION	GRAVEL	SAND					SILT	CLAY
		VC	C	M	F	VF		

USCS CLASSIFICATION	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	FINE	



Symbol	□	■
Boring	TP-2	TP-2
Sample	S-1	S-1
Replicate	A	B
Depth	4	4
% +3"		
% Gravel	0.2	0.2
% SAND	75.2	74.8
% V.C.Sand		0.4
% C.Sand	1.6	2.1
% M.Sand	14.9	15.3
% F.Sand	33	33
% V.F.Sand	25.7	24
% SILT	19.3	18.3
%CLAY	5.3	6.7
w (%)	11.3	11.9

Particle Size	PERCENT FINER	
(Sieve #)	□	■
4"	100.0	100.0
3"	100.0	100.0
1 1/2"	100.0	100.0
3/4"	100.0	100.0
3/8"	100.0	100.0
#4	100.0	99.8
#10	99.8	99.8
#20	99.8	99.0
#40	96.7	95.9
#60	83.3	82.0
#100	62.8	63.6
#200	40.3	39.6

PLOT SYMBOL	USCS GROUP SYMBOL	USDA CLASSIFICATION	DESCRIPTION AND REMARKS
□	SM	Sandy Loam	Brown, Silty sand
■	SM	Sandy Loam	Brown, Silty sand

PARTICLE SIZE DISTRIBUTION

Matrix New World Engineering, P.C.

DPMC Washington Crossing Visitor

Project No.	
21005948A	October 2021

TerraSense

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

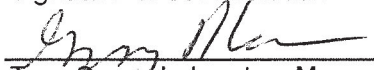
Form 3c. Soil Permeability Class Rating Data

1. Project Number	20-932		Replicate (Letter)	A	
2. Sample Depth	5	Soil Pit/Boring Number	TP-2	Sample	S-2

3. Coarse Fragment Content:	
Total Weight of Sample, WT, grams	528.82
Weight of Material Retained on 2mm sieve, WCF, grams	190.38
Wt. % Coarse Fragments (W.C.F. / W.T. x 100)	36.0
4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.:	39.56
5. Hydrometer Calibration, Rc:	6.25
6. Hydrometer Reading -- 40 seconds, grams, R1:	23.75
Temperature of suspension. °F	71
7. Corrected Hydrometer Reading, grams, R1':	18.1
8. Hydrometer Reading -- 2 hours, grams, R2:	11.962
Temperature of suspension. °F	70
9. Corrected Hydrometer Reading, grams, R2':	6.1
10. % Sand = (Wt. - R1')/Wt. x 100 =	54%
11. % Clay = R2'/Wt. x 100 =	15%
12. Sieve Analysis:	
a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction	24.11
b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams	17.94
c. % Fine Plus Very Fine Sand (b/a)	74%
13. Soil Morphology (Natural Soil Samples Only):	
Structure of Soil Horizon Tested	
Consistence of Soil Horizon Tested: Dry:	Moist:
14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples)	K2

15. I hereby certify that the information furnished on Form 3c of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-A et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator



TerraSense Laboratory Manager, Totowa, NJ

Date: 10/14/2021

Signature of Professional Engineer

License #

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Form 3c. Soil Permeability Class Rating Data

1. Project Number	20-932		Replicate (Letter)	B	
2. Sample Depth	5	Soil Pit/Boring Number	TP-2	Sample	S-2

3. Coarse Fragment Content:	
Total Weight of Sample, WT, grams	624.00
Weight of Material Retained on 2mm sieve, WCF, grams	199.68
Wt. % Coarse Fragments (W.C.F. / W.T. x 100)	32.0
4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.:	39.17
5. Hydrometer Calibration, Rc:	6.25
6. Hydrometer Reading -- 40 seconds, grams, R1:	23.75
Temperature of suspension. °F	71
7. Corrected Hydrometer Reading, grams, R1':	18.1
8. Hydrometer Reading -- 2 hours, grams, R2:	11.962
Temperature of suspension. °F	70
9. Corrected Hydrometer Reading, grams, R2':	6.1
10. % Sand = (Wt. - R1')/Wt. x 100 =	54%
11. % Clay = R2'/Wt. x 100 =	16%
12. Sieve Analysis:	
a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction	23.62
b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams	16.56
c. % Fine Plus Very Fine Sand (b/a)	70%

13. Soil Morphology (Natural Soil Samples Only):
Structure of Soil Horizon Tested
Consistence of Soil Horizon Tested: Dry: Moist:

14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples) K2

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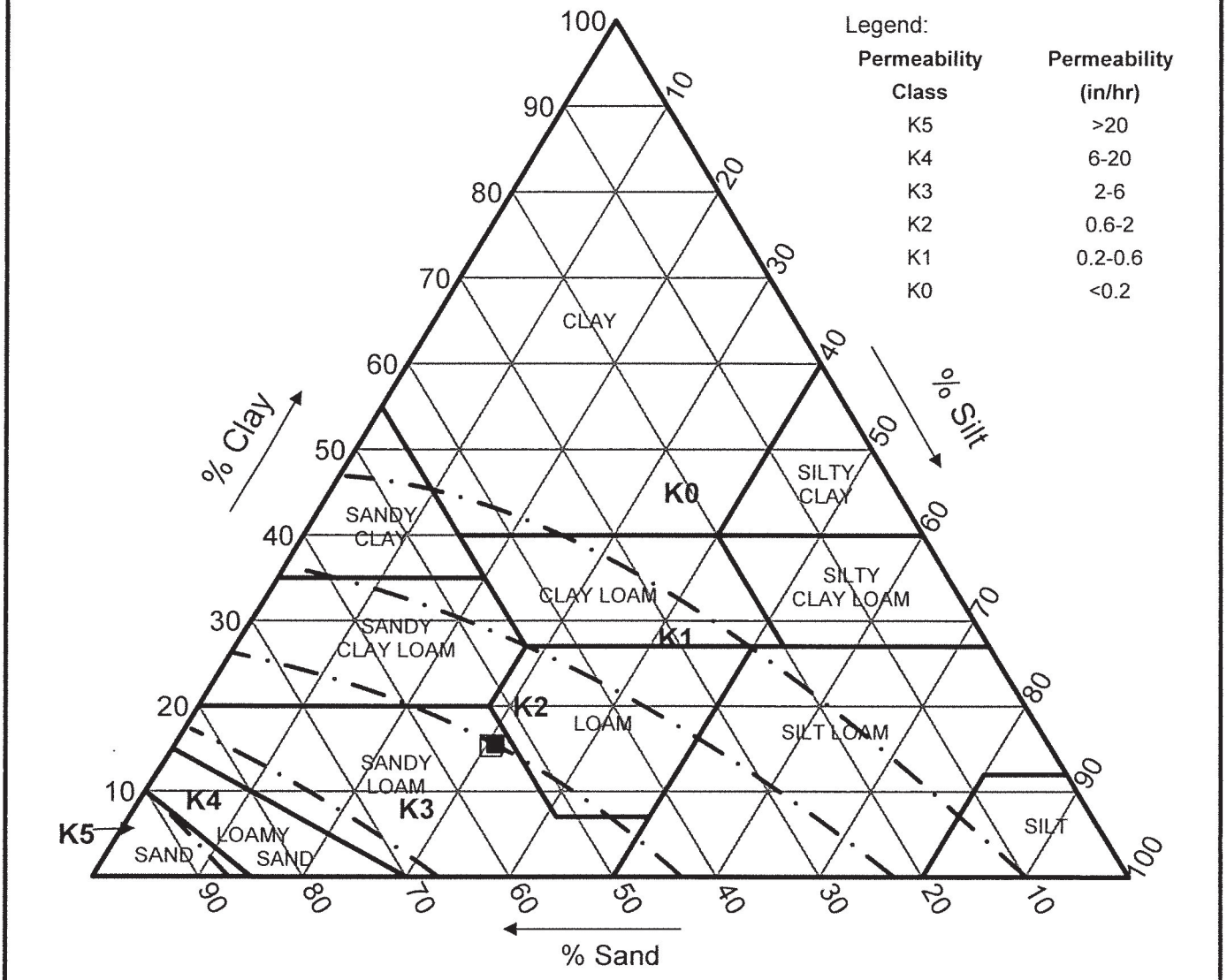
Signature of Soil Evaluator — Date

10/14/2021

TerraSense Laboratory Manager, Totowa, NJ

Signature of Professional Engineer — License #



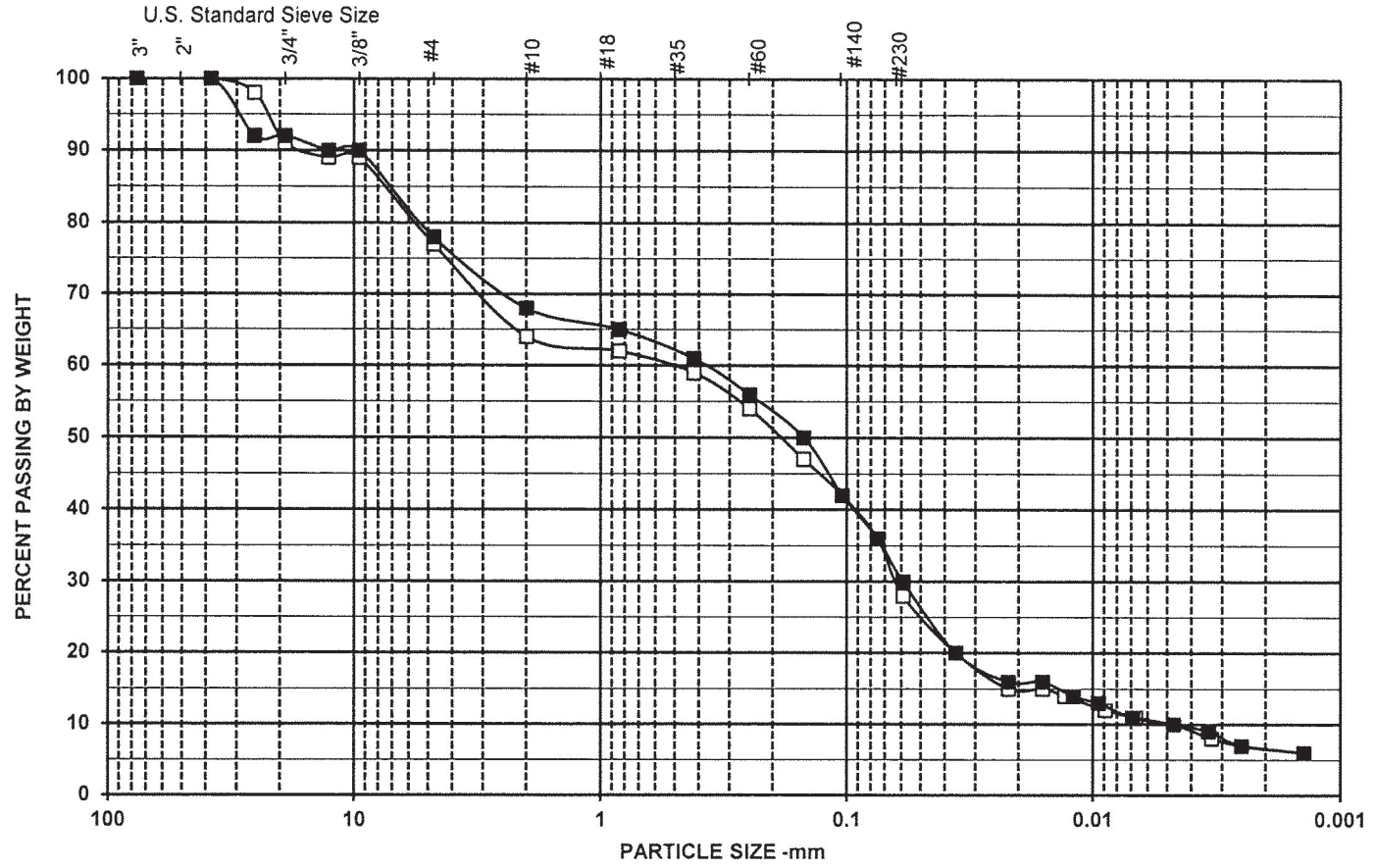
Symbol	Boring Sample	REPLICATE	Normalized Values % Sand	% Clay	% Silt	Permeability Class Rating measured	corrected*	USDA Textural Classification
□	TP-2 S-2	A	54.1	15.3	30.5	K3	K2	Sandy Loam
■	TP-2 S-2	B	53.7	15.5	30.8	K3	K2	Sandy Loam

*as corrected for very fine sand component

Matrix New World Engineering, P.C. Project # 20-932	**Mercer County Titusville, NJ DPMC Washington Crossing Visitor Center**	**Soil Permeability / Textural Triangle by Permeability Class Rating Test**
TerraSense Project # 21005948A		

USDA CLASSIFICATION	GRAVEL	SAND					SILT	CLAY
		VC	C	M	F	VF		

USCS CLASSIFICATION	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	FINE	



Symbol	□	■
Boring	TP-2	TP-2
Sample	S-2	S-2
Replicate	A	B
Depth	5	5
% +3"		
% Gravel	36	32
% SAND	39	41
% V.C.Sand	3	3
% C.Sand	1	3
% M.Sand	6	6
% F.Sand	12	14
% V.F.Sand	17	15
% SILT	18	20
%CLAY	7	7
w (%)	16.3	16.6

Particle Size	PERCENT FINER	
(Sieve #)	□	■
4"	100	100
3"	100	100
1 1/2"	100	100
3/4"	91	92
3/8"	89	90
#4	77	78
#10	64	68
#20	62	65
#40	59	61
#60	54	56
#100	47	50
#200	36	36

PLOT SYMBOL	USCS GROUP SYMBOL	USDA CLASSIFICATION	DESCRIPTION AND REMARKS
□	SM	Sandy Loam	Brown, Silty sand with gravel
■	SM	Sandy Loam	Brown, Silty sand with gravel

PARTICLE SIZE DISTRIBUTION

Matrix New World Engineering, P.C.

DPMC Washington Crossing Visitor

Project No.	
21005948A	October 2021

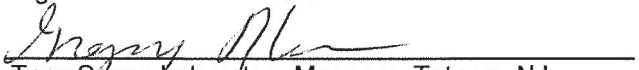
TerraSense

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Form 3c. Soil Permeability Class Rating Data

1. Project Number 20-932 Replicate (Letter) A
2. Sample Depth 7.2 Soil Pit/Boring Number TP-2 Sample S-3
3. Coarse Fragment Content:
   - Total Weight of Sample, WT, grams: 578.59
   - Weight of Material Retained on 2mm sieve, WCF, grams: 376.08
   - Wt. % Coarse Fragments (W.C.F. / W.T. x 100): 65.0
4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.: 39.24
5. Hydrometer Calibration, Rc: 6.25
6. Hydrometer Reading -- 40 seconds, grams, R1: 26
   Temperature of suspension. °F: 71
7. Corrected Hydrometer Reading, grams, R1': 20.4
8. Hydrometer Reading -- 2 hours, grams, R2: 13.212
   Temperature of suspension. °F: 70
9. Corrected Hydrometer Reading, grams, R2': 7.3
10. % Sand = (Wt. - R1')/Wt. x 100 = 48%
11. % Clay = R2'/Wt. x 100 = 19%
12. Sieve Analysis:
    a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction: 21.30
    b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams: 14.68
    c. % Fine Plus Very Fine Sand (b/a): 69%
13. Soil Morphology (Natural Soil Samples Only):
    Structure of Soil Horizon Tested
    Consistence of Soil Horizon Tested: Dry: Moist:
14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples): K1
15. I hereby certify that the information furnished on Form 3c of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-A et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator — Date



10/14/2021

TerraSense Laboratory Manager, Totowa, NJ

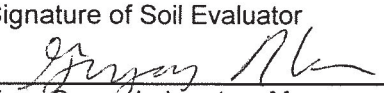
Signature of Professional Engineer — License #

Mercer County / Titusville, NJ
DPMC Washington Crossing Visitor Center
APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

Form 3c. Soil Permeability Class Rating Data

1. Project Number 20-932 Replicate (Letter) B
2. Sample Depth 7.2 Soil Pit/Boring Number TP-2 Sample S-3
3. Coarse Fragment Content:
   - Total Weight of Sample, WT, grams: 650.42
   - Weight of Material Retained on 2mm sieve, WCF, grams: 461.80
   - Wt. % Coarse Fragments (W.C.F. / W.T. x 100): 71.0
4. Oven Dry Weight (24 hrs, 105°C) of sample. Wt.: 39.16
5. Hydrometer Calibration, Rc: 6.25
6. Hydrometer Reading -- 40 seconds, grams, R1: 26
   - Temperature of suspension. °F: 71
7. Corrected Hydrometer Reading, grams, R1': 20.4
8. Hydrometer Reading -- 2 hours, grams, R2: 12.962
   - Temperature of suspension. °F: 70
9. Corrected Hydrometer Reading, grams, R2': 7.1
10. % Sand = (Wt. - R1')/Wt. x 100 = 48%
11. % Clay = R2'/Wt. x 100 = 18%
12. Sieve Analysis:
    - a. Oven Dry Wt. (2hrs., 105°C) Total Sand Fraction: 21.61
    - b. Wt. of Fine Plus Very Fine Sand Fraction (Sand Passing 0.25mm Sieve), grams: 14.88
    - c. % Fine Plus Very Fine Sand (b/a): 69%
13. Soil Morphology (Natural Soil Samples Only):
    - Structure of Soil Horizon Tested
    - Consistence of Soil Horizon Tested: Dry: Moist:
14. Soil Permeability Class Rating (Based upon average textural analysis of this replicate and other replicate samples): K1
15. I hereby certify that the information furnished on Form 3c of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-A et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator

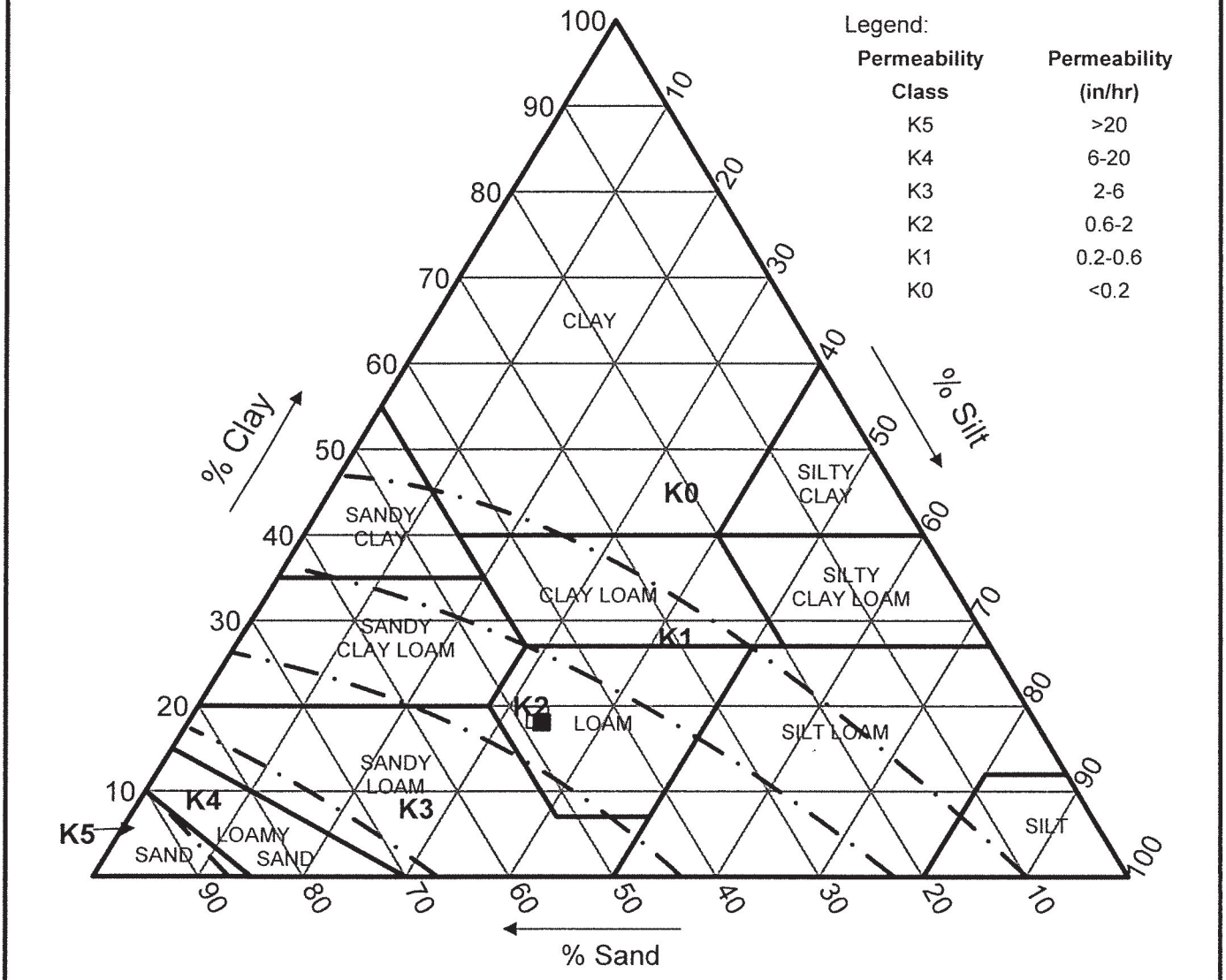


TerraSense Laboratory Manager, Totowa, NJ

Date: 10/14/2021

Signature of Professional Engineer

License #



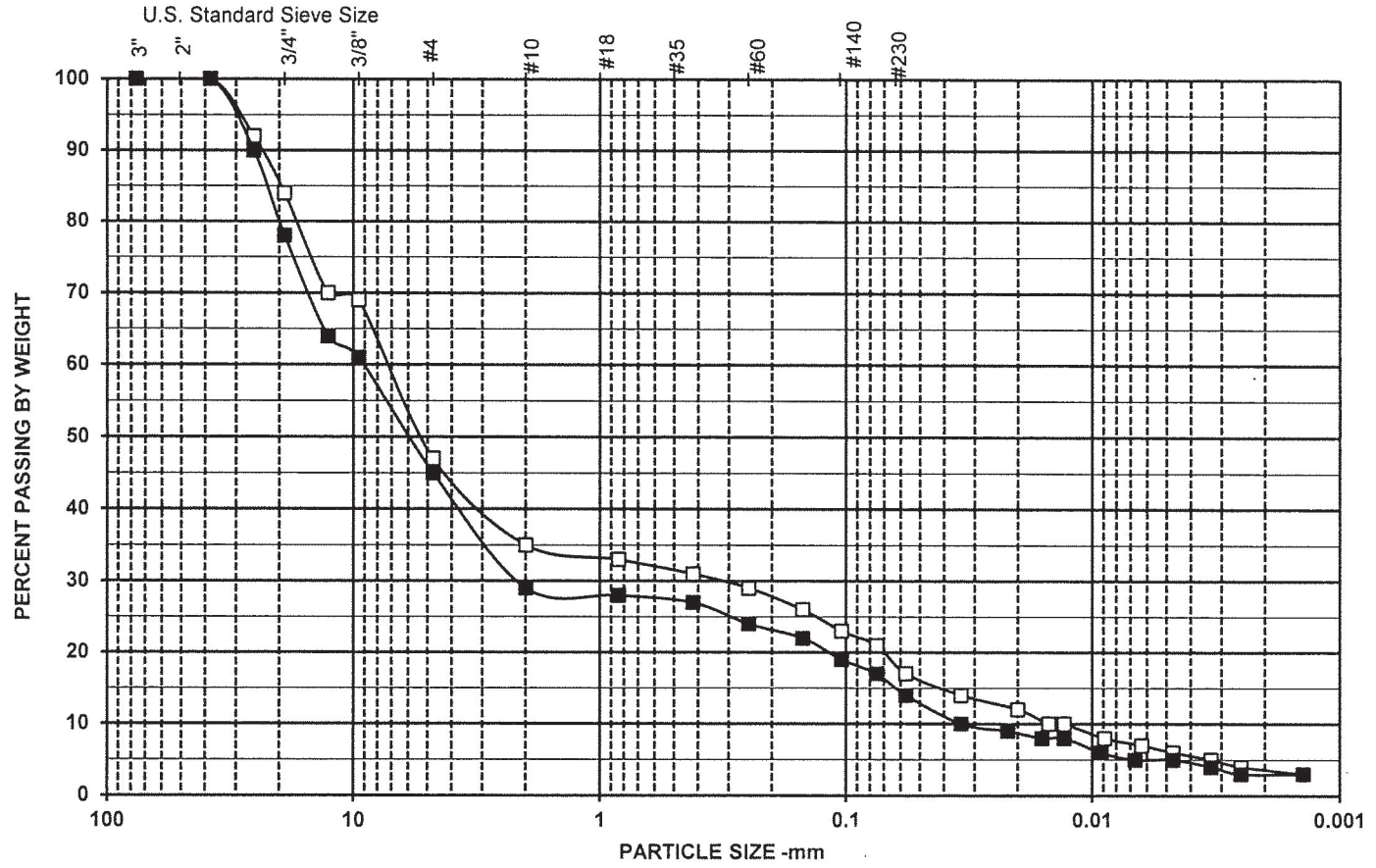
Symbol	Boring Sample	REPLICATE	Normalized Values % Sand	% Clay	% Silt	Permeability Class Rating measured	corrected*	USDA Textural Classification
□	TP-2 S-3	A	48.0	18.7	33.3	K2	K1	Loam
■	TP-2 S-3	B	47.9	18.1	34.0	K2	K1	Loam

*as corrected for very fine sand component

Matrix New World Engineering, P.C. Project # 20-932	**Mercer County Titusville, NJ DPMC Washington Crossing Visitor Center**	**Soil Permeability / Textural Triangle by Permeability Class Rating Test**
TerraSense Project # 21005948A		

USDA CLASSIFICATION	GRAVEL	SAND					SILT	CLAY
		VC	C	M	F	VF		

USCS CLASSIFICATION	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	FINE	



PLOT SYMBOL	USCS GROUP SYMBOL	USDA CLASSIFICATION	DESCRIPTION AND REMARKS
□	GM	Loam	Brown, Silty gravel with sand
■	GM	Loam	Brown, Silty gravel with sand

Symbol	□	■
Boring	TP-2	TP-2
Sample	S-3	S-3
Replicate	A	B
Depth	7.2	7.2
% +3"		
% Gravel	65	71
% SAND	19	16
% V.C.Sand	3	2
% C.Sand		
% M.Sand	3	3
% F.Sand	6	5
% V.F.Sand	7	6
% SILT	12	10
%CLAY	4	3
w (%)	12.8	12.1

Particle Size	PERCENT FINER	
(Sieve #)	□	■
4"	100	100
3"	100	100
1 1/2"	100	100
3/4"	84	78
3/8"	69	61
#4	47	45
#10	35	29
#20	33	28
#40	31	27
#60	29	24
#100	26	22
#200	21	17

PARTICLE SIZE DISTRIBUTION

Matrix New World Engineering, P.C.

DPMC Washington Crossing Visitor

Project No.	
21005948A	October 2021

TerraSense