

SCOPE OF WORK

CODIS LABORATORY RENOVATION

NJ State Police Technology Complex
Hamilton, Mercer County, N.J.

PROJECT NO. S0542-00

STATE OF NEW JERSEY

Honorable Chris Christie, Governor
Honorable Kim Guadagno, Lt. Governor

DEPARTMENT OF THE TREASURY

Andrew P. Sidamon-Eristoff, Treasurer



DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION

Steven Sutkin, Director

Date: July 25, 2011

TABLE OF CONTENTS

SECTION	PAGE
I. OBJECTIVE	7
II. CONSULTANT QUALIFICATIONS	7
A. CONSULTANT & SUB-CONSULTANT PRE-QUALIFICATIONS	
III. PROJECT BUDGET	7
A. CONSTRUCTION COST ESTIMATE (CCE)	
B. CURRENT WORKING ESTIMATE (CWE)	
C. COST ESTIMATING	
D. CONSULTANT'S FEES	
IV. PROJECT SCHEDULE.....	9
A. SCOPE OF WORK DESIGN & CONSTRUCTION SCHEDULE	
B. CONSULTANT'S PROPOSED DESIGN & CONSTRUCTION SCHEDULE	
C. CONSULTANT DESIGN SCHEDULE	
D. BID DOCUMENT CONSTRUCTION SCHEDULE	
E. CONTRACTOR CONSTRUCTION PROGRESS SCHEDULE	
V. PROJECT SITE LOCATION & TEAM MEMBERS	11
A. PROJECT SITE ADDRESS	
B. PROJECT TEAM MEMBER DIRECTORY	
1. DPMC Representative	
2. Client Agency Representative	
VI. PROJECT DEFINITION	12
A. BACKGROUND	
B. FUNCTIONAL DESCRIPTION OF THE BUILDING	

VII. CONSULTANT DESIGN RESPONSIBILITIES 13

- A. SCHEMATIC PHASE
 - 1. Site Survey
 - 2. Presentation
- B. DESIGN PHASE
 - 1. Demolition
 - 2. Structural Design
 - 3. Electrical Design
 - 4. Fire Detection
 - 5. Fire Suppression
 - 6. HVAC Design
 - 7. Plumbing Design
 - 8. Lighting Design
 - 9. Security Design
 - 10. Interior Design
 - 11. Furniture Design
- C. GENERAL DESIGN OVERVIEW
 - 1. Design Detail
 - 2. Specification Format
- D. PROJECT COMMENCEMENT
 - 1. Project Directory
 - 2. Site Access
 - 3. Project Coordination
 - 4. Existing Documentation
 - 5. Scope of Work
 - 6. Project Schedule
- E. BUILDING & SITE INFORMATION
 - 1. Building Classification
 - 2. Building Block & Lot Number
 - 3. Building Site Plan
 - 4. Site Location Map
- F. DESIGN MEETINGS & PRESENTATIONS
 - 1. Design Meetings
 - 2. Design Presentations

VIII. CONSULTANT CONSTRUCTION RESPONSIBILITIES..... 23

- A. GENERAL CONSTRUCTION ADMINISTRATION OVERVIEW
 - B. PRE-BID MEETING
 - C. BID OPENING
 - D. POST BID REVIEW MEETING, RECOMMENDATION FOR AWARD
 - 1. Post Bid Review
-

- 2. Review meeting
- 3. Substitutions
- 4. Schedule
- 5. Performance
- 6. Superintendent
- 7. Letter of Recommendation
- 8. Conformed Drawings
- E. DIRECTOR'S HEARING
- F. CONSTRUCTION JOB MEETINGS, SCHEDULES, LOGS
 - 1. Meetings
 - 2. Schedules
 - 3. Submittal Log
- G. CONSTRUCTION SITE ADMINISTRATION SERVICES
- H. SUB-CONSULTANT PARTICIPATION
- I. DRAWINGS
 - 1. Shop Drawings
 - 2. As-Built & Record Set Drawings
- J. CONSTRUCTION DEFICIENCY LIST
- K. INSPECTIONS: SUBSTANTIAL & FINAL COMPLETION
- L. CLOSE-OUT DOCUMENTS
- M. CLOSE-OUT ACTIVITY TIME
- N. TESTING, TRAINING, MANUALS, AND ATTIC STOCK
 - 1. Testing
 - 2. Training
 - 3. Manuals
 - 4. Attic Stock
- O. CHANGE ORDERS
 - 1. Consultant
 - 2. Contractor
 - 3. Recommendation for Award
 - 4. Code Review
 - 5. Cost Estimate
 - 6. Time Extension
 - 7. Submission
 - 8. Meetings
 - 9. Consultant Fee

IX. PERMITS & APPROVALS 34

- A. REGULATORY AGENCY PERMITS
 - 1. NJ Uniform Construction Code Permit
 - 2. Other Regulatory Agency Approvals & Permits
 - 3. Prior Approval Certification Letters
-

- B. BARRIER FREE REQUIREMENTS
- C. STATE INSURANCE APPROVAL
- D. PUBLIC EMPLOYEES OCCUPATIONAL SAFETY & HEALTH PROGRAM
- E. MULTI-BUILDING OR MULTI-SITE PERMITS
- F. PERMIT MEETINGS
- G. MANDATORY NOTIFICATIONS
- H. CONSTRUCTION TRAILER PERMITS
- I. SPECIAL INSPECTIONS

X. GENERAL REQUIREMENTS 38

- A. SCOPE CHANGES
- B. ERRORS & OMISSIONS
- C. ENERGY INCENTIVE PROGRAM
- D. AIR POLLUTION FROM ARCHITECTURAL COATINGS

XI. ALLOWANCES 40

- A. PERMIT ALLOWANCE
 - 1. Permits
 - 2. Permit Costs
 - 3. Applications
 - 4. Consultant Fee

XII. SUBMITTAL REQUIREMENTS 41

- A. CONTRACT DELIVERABLES
- B. CATALOG CUTS
- C. PROJECT DOCUMENT BOOKLET
- D. DESIGN DOCUMENT CHANGES
- E. SINGLE-PRIME CONTRACT

XIII. SOW SIGNATURE APPROVAL SHEET 43

XIV. CONTRACT DELIVERABLES 44

XV. EXHIBITS 50

- A. SAMPLE PROJECT SCHEDULE FORMAT
-

PROJECT NAME: CODIS Laboratory Renovation
PROJECT LOCATION: NJ State Police Technology Complex
PROJECT NO: S0542-00
DATE: July 25, 2011

- B. HAMILTON TECHNOLOGY CENTER COMPLEX
- C. EXISTING VEHICLE AREA
- D. SCHEMATIC OF PROPOSED LAB AREA
- E. PHOTOS
- F. REPORT FROM JOSEPH B.CALLAGHAN CONSULTING ENGINEERS

I. OBJECTIVE

The objective of this project is to renovate an existing vehicle inspection area into a fully functional Combined DNA Index System (CODIS) laboratory with an extraction room and a temperature controlled amplification room.

II. CONSULTANT QUALIFICATIONS

A. CONSULTANT & SUB-CONSULTANT PRE-QUALIFICATIONS

The Consultant shall be a firm pre-qualified with the Division of Property Management & Construction (DPMC) in the P001 Architectural Professional Discipline and have in-house capabilities or Sub-Consultants pre-qualified with DPMC in all other Engineering and Specialty Disciplines necessary to complete the project as described in this Scope of Work (SOW).

III. PROJECT BUDGET

A. CONSTRUCTION COST ESTIMATE (CCE)

The initial Construction Cost Estimate (CCE) for this project is \$1,550,000.

The Consultant shall review this Scope of Work and provide a narrative evaluation and analysis of the accuracy of the proposed project CCE in their technical proposal based on their professional opinion.

B. CURRENT WORKING ESTIMATE (CWE)

The Current Working Estimate (CWE) for this project is \$2,000,000.

The CWE includes the construction cost estimate and all consulting, permitting and administrative fees.

The CWE is the Client Agency's financial budget based on this project Scope of Work and shall not be exceeded during the design and construction phases of the project unless DPMC approves the change in Scope of Work through a Contract amendment.

C. COST ESTIMATING

All CCE under \$750,000 may be prepared by the Consultant's in-house staff or their Sub-Consultant's staff during each design phase of the project. However, if the CCE is \$750,000 or larger, the Consultant or Sub-Consultant providing the estimate must be pre-qualified with DPMC in the P025 Estimating/Cost Analysis Specialty Discipline.

All cost estimates shall be adjusted for regional location, site factors, construction phasing, premium time, building use group, location of work within the building, temporary swing space, security issues, and inflation factors based on the year in which the work is to be performed.

All cost estimates must be submitted on a DPMC-38 Project Cost Analysis form at each design phase of the project with a detailed construction cost analysis in CSI format (2004 Edition) for all appropriate divisions and sub-divisions. The Project Manager will provide cost figures for those items which may be in addition to the CCE such as art inclusion, CM services, etc. and must be included as part of the CWE. This cost analysis must be submitted for all projects regardless of the Construction Cost Estimate amount.

D. CONSULTANT'S FEES

The construction cost estimate for this project *shall not* be used as a basis for the Consultant's design and construction administration fees. The Consultant's fees shall be based on the information contained in this Scope of Work document and the observations made and/or the additional information received during the pre-proposal meeting.

IV. PROJECT SCHEDULE

A. SCOPE OF WORK DESIGN & CONSTRUCTION SCHEDULE

The following schedule identifies the estimated design and construction phases for this project and the estimated durations.

PROJECT PHASE	ESTIMATED DURATION (Calendar Days)
1. Schematic Design Phase	35
• <i>Project Team & DPMC Plan/Code Unit Review & Comment</i>	14
2. Final Design Phase	35
• <i>Project Team & DPMC Plan/Code Unit Review & Approval</i>	14
3. Permit Application Phase	7
• <i>Issue Permit</i>	
4. Bid Phase	35
5. Award Phase	21
6. Construction Phase	90

B. CONSULTANT'S PROPOSED DESIGN & CONSTRUCTION SCHEDULE

The Consultant shall submit a project design and construction bar chart schedule with their technical proposal that is similar in format and detail to the schedule depicted in **Exhibit 'A'**. The bar chart schedule developed by the Consultant shall reflect their recommended project phases, phase activities, activity durations.

The Consultant shall estimate the duration of the project Close-Out Phase based on the anticipated time required to complete each deliverable identified in Section XIV of this document entitled "Project Close-Out Phase Contract Deliverables" and include this information in the bar chart schedule submitted.

A written narrative shall also be included with the technical proposal explaining the schedule submitted and the reasons why and how it can be completed in the time frame proposed by the Consultant.

This schedule and narrative will be reviewed by the Consultant Selection Committee as part of the evaluation process and will be assigned a score commensurate with clarity and comprehensiveness of the submission.

C. CONSULTANT DESIGN SCHEDULE

The Project Manager will issue the Consultant's approved project schedule at the first design kickoff meeting. This schedule will be binding for the Consultant's activities and will include the start and completion dates for each design activity. The Consultant and Project Team members shall use this schedule to ensure that all design milestone dates are being met for the project. The Consultant shall update the schedule to reflect performance periodically (minimally at each design phase) for the Project Team review and approval. Any recommendations for deviations from the approved design schedule must be explained in detail as to the causes for the deviation(s) and impact to the schedule.

D. BID DOCUMENT CONSTRUCTION SCHEDULE

The Consultant shall include a construction schedule in Division 1 of the specification bid document. This schedule shall contain, at minimum, the major activities and their durations for each trade specified for the project. This schedule shall be in "bar chart" format and will be used by the Contractors as an aid in determining their bid price. It shall reflect special sequencing or phased construction requirements including, but not limited to: special hours for building access, weather restrictions, imposed constraints caused by Client Agency program schedules, security needs, lead times for materials and equipment, anticipated delivery dates for critical items, utility interruption and shut-down constraints, and concurrent construction activities of other projects at the site and any other item identified by the Consultant during the design phases of the project.

E. CONTRACTOR CONSTRUCTION PROGRESS SCHEDULE

The Contractor shall be responsible for preparing a coordinated combined progress schedule with the Sub-Contractors after the award of the contract. This schedule shall meet all of the requirements identified in the Consultant's construction schedule. The construction schedule shall be completed in accordance with the latest edition of the Instructions to Bidders and General Conditions entitled, "Article 9, Construction Progress Schedule" (No CPM).

The Consultant must review and analyze this progress schedule and recommend approval/disapproval to the Project Team until a satisfactory version is approved by the Project Team. The Project Team must approve the baseline schedule prior to the start of construction and prior to the Contractor submitting invoices for payment.

PROJECT NAME: CODIS Laboratory Renovation
PROJECT LOCATION: NJ State Police Technology Complex
PROJECT NO: S0542-00
DATE: July 25, 2011

The Consultant shall note in Division 1 of the specification that the State will not accept the progress schedule until it meets the project contract requirements and any delays to the start of the construction work will be against the Contractor until the date of acceptance by the State.

The construction progress schedule shall be reviewed, approved, and updated by the Contractor of schedule, Consultant, and Project Team members at each regularly scheduled construction job meeting and the Consultant shall note the date and trade(s) responsible for project delays (as applicable).

V. PROJECT SITE LOCATION & TEAM MEMBERS

A. PROJECT SITE ADDRESS

The location of the project site is:

NJSP Technology Complex
1200 Negron Drive
Hamilton, Mercer County, NJ 08619

See **Exhibit 'B'** for the project site.

B. PROJECT TEAM MEMBER DIRECTORY

The following are the names, addresses, and phone numbers of the Project Team members.

1. DPMC Project Manager:

Name:	<u>David Lapidus, Design Project Manager</u>
Address:	<u>Division Property Management & Construction</u>
	<u>20 West State Street, 3rd Floor</u>
	<u>Trenton, NJ 08625</u>
Phone No:	<u>(609) 984-9707</u>
E-Mail No:	<u>David.Lapidus@treas.state.nj.us</u>

PROJECT NAME: CODIS Laboratory Renovation
PROJECT LOCATION: NJ State Police Technology Complex
PROJECT NO: S0542-00
DATE: July 25, 2011

2. New Jersey State Police:

Name: SFC Cliff Hunt #5072, Project Manager
Address: New Jersey State Police
Assistant Unit Head
Facility & Building Maintenance Unit
Building #17
Division Headquarters
West Trenton, NJ 08628
Phone No: (609) 882-2000 ext. 2559, Fax (609) 530-9753
E-Mail No: LPP5072@gw.njsp.org

3. New Jersey State Police:

Name: Joseph Petersack, DNA Laboratory Director
Address: New Jersey State Police
1200 Negron Drive
Hamilton, New Jersey 08691
Phone No: (609) 584-5054 ext 5721, Fax (609) 587-8828
E-Mail No: LPPPETEJ@gw.njsp.org

VI. PROJECT DEFINITION

A. BACKGROUND

The New Jersey State Police Technology Complex is located in Hamilton Township, Mercer County, New Jersey. Opened in 2004, it is the center of various high technology law enforcement activities in the state. The Technology Complex houses several NJSP bureaus: The State Police Forensic Sciences Bureau, Records and Identification Section, Information Technology Bureau, various investigative units, a forensic laboratory, and common facilities.

The Office of Forensic Sciences (OFS) desires to move an existing Combined DNA Index System (CODIS) laboratory to a new space within the building that will be renovated for the purpose. The space to be renovated is currently being used for vehicle processing and is the focus of this project. The movement of the existing CODIS laboratory will free up space for a new lab that will use new technology. The renovation of the existing CODIS laboratory space is not part of this project.

B. FUNCTIONAL DESCRIPTION OF THE BUILDING

The Technology Complex is a 195,000 sq ft pre-engineered structure that was originally intended for use as an office building for the Division of Revenue. Shortly after the State purchased the pre-engineered building shell, it was decided to use the building as a multi-purpose State Police facility with forensic laboratories. It officially opened in 2004. The main part of the building is 200 feet wide and 800 feet long and houses the existing vehicle processing rooms and the DNA laboratories.

The existing floor plan is shown in **Exhibit 'C'**. What is now vehicle processing room #1 will become the amplification room. This room will need to be temperature controlled within a range of 68-72 degrees F. What is now vehicle processing room #2 will be opened up into the existing vehicle receiving room and become the extraction room. Existing counter space and hoods in the vehicle processing rooms shall remain. The proposed design layout is shown in **Exhibit 'D'**. Photos are in **Exhibit 'E'**.

A May, 2010 report by Edwards and Kelcey indicated that the roof cannot support additional loads. As a result, the State commissioned Joseph B. Callaghan, Inc. Consulting Engineers to perform an analysis of the floor and existing CMU walls to determine what would be needed to build a "building within a building". Callaghan's report is shown in **Exhibit 'F'**.

VII. CONSULTANT DESIGN RESPONSIBILITIES

A. SCHEMATIC PHASE

Review the report from Joseph B. Callaghan, Inc., shown in **Exhibit 'F'** and provide the design and specifications to convert the identified space into laboratory facilities. The following shall be used as a guide.

1. Site Survey:

Survey the existing building utilities and determine their capacities to ensure that they will support the new laboratory space. Identify all of the existing and proposed new support systems required for the new laboratories including, but not limited to: electrical, plumbing, security, fire, HVAC, and emergency systems (i.e. eye wash and shower stations).

Identify all of the existing and proposed equipment, counter tops, sinks, hoods and refrigeration required for the spaces.

Document all of the information in the Schematic Phase in a format that will facilitate the DPMC Project Team members to review and approve the recommended design of the laboratories, the type of fixtures and equipment to be installed in that space and the most economic and efficient utility systems.

2. Presentation:

Make an oral presentation of the Schematic Phase information collected and, based on findings, submit diagrams and sketches of the proposed spaces to the Project Team members for review and approval prior to the preparation of the design documents.

Diagrams and sketches shall include, but not be limited to the following items: a floor plan of the space indicating the locations of the perimeter and interior walls, access doors, equipment, countertops, sinks, hoods and refrigeration.

Provide 8 bound copies of all the information and backup documentation described above to the DPMC Project Manager for distribution.

B. DESIGN PHASE

1. Demolition:

The interior demolition design requirements for this project shall include, but not be limited to the following items:

Provide detailed drawings that depict the approved method of protecting the existing countertops, equipment, hoods and interior finishes of the construction area.

Indicate the location and dimensioned details for any temporary construction partition walls for security, plastic barriers for dust and dirt containment, and special covers for the equipment.

Identify existing ductwork, electric conduit, light fixtures and switches, outlets, ceiling grid, electrical junction boxes, panels, brackets, hangers and other obstructions required to be removed and/or be relocated in order to move any interior partition walls, add new walls, add a raised floor (if recommended), etc.

Identify the procedures necessary to protect any smoke detector heads from dust and potential false alarms during the demolition work.

Identify the approved methods to remove the demolition material from the building, security policies of the building, security guard coordination, dumpster location and access for the removal of the materials from the property.

Describe the acceptable standards of cleanliness that the contractor must meet each workday in the area.

2. Structural Design:

Using the Callaghan report as a guide, provide the design and specifications for new 8 inch thick cmu walls doweled into the existing slab and walls. Provide for a new 8 inch deep ceiling steel joist framing.

Obtain the services of a DPMC pre-qualified structural engineer to perform a structural analysis necessary to reconfigure the wind bracing, as identified in the Callaghan Report, and provide for a new overhead door to the proposed second vehicle inspection bay.

Provide a new approach driveway and associated curbing to the new overhead door.

Provide concrete filled steel bollards in concrete footings within the vehicle bays to protect the wall separating the vehicle bays from the extraction room.

Provide a list in Division 1 of the specification that describes the construction performance standards necessary to maintain a clean work environment during construction.

Provide a vestibule for the extraction room similar to the existing one in the amplification room.

3. Electrical Design:

The electrical design requirements for this project shall include, but not be limited to the following items:

Survey all of the electric service wiring, panels, and related components installed in the area to verify their location and capacity.

Provide signed and sealed calculations and data indicating the electrical capacity and power distribution system serving the proposed laboratories is adequate for the existing and new electrical equipment loads including the equipment and HVAC systems.

Investigate the existing load on the emergency generator and UPS system and determine the amount of backup capacity available. If enough capacity is available, selected equipment within the new laboratories shall be tied into the emergency generator system. Equipment to be tied in shall include, but not be limited to, refrigeration.

Provide a design for the electrical distribution to all renovated spaces of the new laboratories and vehicle bays ensuring the appropriate amount of branch panels, circuit breakers, transformers, switches and outlets are provided in each area.

Electrical drawings shall include lighting, power, communications, fire detection and alarm, security, and any specialized systems. Riser diagrams shall indicate the tie-in of all new electrical circuits and panels to the existing electrical service. Include all wire and conduit sizes, current demand factors, and switch and panel schedules on the drawings.

Provide a design for surge protection where required.

4. Fire Detection Design:

The design requirements for the fire detection system shall include, but not be limited to the following items:

Provide the design and specification to extend the existing fire detection system into the new spaces and upgrade and/or replace any components of the existing fire detection system that will serve the laboratories and vehicle spaces to ensure that it meets all of the requirements of NFPA 72. No component of the existing fire detection system may be abandoned in place.

Provide a wiring diagram on the drawing indicating the zoning, the grouping of devices, and the number of wires to each device. All wiring shall be color-coded and the Electrical Contractor shall submit a color-coded schedule to the DPMC Project Manager for approval prior to installation.

Specify the correct detection device for the environment. Smoke detectors shall be the photoelectric type and shall be thoroughly cleaned of all construction dust immediately prior to testing for acceptance.

The system shall be installed, programmed, tested, and delivered in fully operational condition.

The system shall include hardware, software, panels, detectors, raceways, and interconnecting wiring necessary to accomplish the requirements of this project.

Upon completion of the system installation, a demonstration by the manufacturer's representative shall be performed, testing each device and function in accordance with NFPA 72H. The system test shall be witnessed and approved by the Department of Community Affairs (DCA).

The Consultant shall provide ample notification time when arranging the demonstration with DCA, DPMC Project Team members, Contractor, and equipment manufacturer. Applicable portions of the NFPA 72H code shall be included in the specification for reference.

Upon final acceptance of the system, the Contractor shall provide a complete as-built color coded wiring diagram. The diagram shall include a written statement signed by the Contractor and manufacturers representative that the diagram has been corrected to include field changes and does represent the system installed.

Install emergency lighting in the laboratories and areas leading to the emergency exits on the floor.

All applicable warranties shall be provided.

5. Fire Suppression Design:

The design documents for the fire suppression system shall include, but not be limited to the following items:

The Consultant shall provide the design specifications to extend the existing fire suppression system into the new spaces. Extension of the existing system will not require any flow testing or calculations.

Provide a statement in the specification and on the drawing that states: "If the sprinkler Contractor prepares shop drawings that differ in design from those supplied by the Consultant, they shall submit them to the DPMC Design & Code Review Unit Supervisor for approval prior to fabrication and installation of the system".

Upon completion of the project, and prior to issuance of the Certificate of Approval, the Contractor shall test the complete fire suppression and detection system in accordance with NFPA testing guidelines. All testing shall be conducted in the presence of the Department of Community Affairs and the DPMC representatives. The Consultant shall coordinate and schedule all of the tests and collected and bind the results in a manual for reference.

6. HVAC Design:

The heating, cooling and humidity design requirements for this project shall include, but not be limited to the following items:

Prepare signed & sealed cooling load calculations verifying that the capacity of the new air conditioning and humidity equipment selected will address the heat loads and humidity requirements. The inventory of existing and new equipment, personnel, lighting and other heat sources shall be used for these calculations.

The amplification room HVAC system shall be designed to maintain the room between 68 and 72 degrees Fahrenheit at all times.

It is not permissible to utilize the roof or original building structure for any new equipment. The new ceiling structure designed as part of this project may be used provided that signed and sealed structural

calculations certify that the structure will support the new air conditioning equipment. Determine and provide any enhancements required to allow the new roof structure to support the new imposed equipment loads.

The existing system that serves the area shall be altered as necessary.

Include equipment schedules indicating all HVAC equipment by symbol designation, name and estimated size or capacity in BTU etc.

Include ventilation schedules for the HCC spaces. The capacity of the air supply, return and exhaust air shall be verified with signed and sealed calculations.

Design all associated HVAC controls necessary for the proper operation of the system and related components. Items to address shall include thermostats, wiring, smoke detector shutdown and interface with the fire alarm panel.

Prior to issuance of a Certificate of Occupancy, the Contractor shall test all cooling air conditioning units, controls, and related components for proper operation and approval.

7. Plumbing Design:

The plumbing design requirements for this project shall include, but not be limited to the following items:

The new vehicle bays shall be provided with a sink as shown in **Exhibit 'D'**.

Provide the plumbing design to add an emergency shower station to the laboratory area. Examples of an emergency shower system can be seen elsewhere in the building.

Provide a sink within the proposed vestibule to allow for sanitizing prior to entering the lab area.

8. Lighting Design:

The lighting design requirements for this project shall include, but not be limited to the following items:

Provide a reflected ceiling plan that provides adequate lighting for the laboratory spaces. Ensure that existing lighting for the new vehicle spaces remains adequate for the purpose.

9. Security Design:

The security design requirements for this project shall include, but not be limited to the following items:

The existing access system shall be extended and modified to accommodate the new work, with no need for a separate independent system. This system shall be specified to be extended by the existing designated system vendor. All affected facility doors shall be identified on the drawings.

10. Interior Design:

The interior design requirements for this project shall include, but not be limited to the following items:

Provide non-porous cleanable surfaces within the laboratories.

11. Furniture Design:

The design requirements for the furniture and equipment shall include, but not be limited to the following items:

Coordinate with the facility staff and project team to determine what cabinetry, furniture or other items might be pre-purchased under a separate contract by the client agency or made a part of the Consultant's responsibility.

Provide the design and specifications for items that are not pre-purchased or obtain the specifications for pre-purchased items such as cabinetry, countertops and hoods and incorporate them into the design of the laboratories and vehicle processing rooms.

The Consultant is not responsible for loose furniture that is not a permanent part of the rooms, such as tables and chairs.

C. GENERAL DESIGN OVERVIEW

1. Design Detail:

Section VII of this Scope of Work is intended as a guide for the Consultant to understand the overall basic design requirements of the project and is not intended to identify each specific design component related to code and construction items. The Consultant shall provide those details during the design phase of the project ensuring that they are in compliance with all applicable codes, regulating authorities, and the guidelines established in the DPMC Procedures for Architects and Engineers Manual.

The Consultant shall understand that construction documents submitted to DPMC shall go beyond the basic requirements set forth by the current copy of the Uniform Construction Code NJAC 5:23-2.15(f). Drawings and specifications shall provide detail beyond that required to merely show the nature and

character of the work to be performed. The construction documents shall provide sufficient information and detail to illustrate, describe and clearly delineate the design intent of the Consultant and enable all Contractors to uniformly bid the project.

The Consultant shall ensure that all of the design items described in this scope of work are addressed and included in the project drawings and specification sections where appropriate.

It shall be the Consultant's responsibility to provide all of the design elements for this project. Under no circumstance may they delegate the responsibility of the design; or portions thereof, to the Contractor unless specifically allowed in this Scope of Work.

2. Specification Format:

The Consultant shall ensure that the project design specifications are formatted in the revised and expanded version of the Construction Specifications Institute (CSI) format entitled "Master Format 2004 Edition: Numbers and Titles."

The Consultant shall review all of the CSI Master Format 2004 specification sections listed and remove those that do not apply and edit those that remain so they are consistent and specific to this project scope of work.

D. PROJECT COMMENCEMENT

A pre-design meeting shall be scheduled with the Consultant and the Project Team members at the commencement of the project to obtain and/or coordinate the following information:

1. Project Directory:

Develop a project directory that identifies the name and phone number of key designated representatives who may be contacted during the design and construction phases of this project.

2. Site Access:

Develop procedures to access the project site and provide the names and phone numbers of approved escorts when needed. Obtain copies of special security and policy procedures that must be followed during all work conducted at the facility and include this information in Division 1 of the specification.

3. Project Coordination:

Review and become familiar with any current and/or future projects at the site that may impact the design, construction, and scheduling requirements of this project. Incorporate all appropriate information and coordination requirements in Division 1 of the specification.

4. Existing Documentation:

Review any documents and additional information that may be provided at a later date such as reports, studies, surveys, equipment manuals, as-built drawings, etc. The State does not attest to the accuracy of the information provided and accepts no responsibility for the consequences of errors by the use of any information and material contained in the documentation provided. It shall be the responsibility of the Consultant to verify the contents and assume full responsibility for any determination or conclusion drawn from the material used. If the information provided is insufficient, the Consultant shall take the appropriate actions necessary to obtain the additional information required.

All original documentation shall be returned to the provider at the completion of the project.

5. Scope of Work:

Review the design and construction administration responsibilities and the submission requirements identified in this Scope of Work with the Project Team members. Items such as: contract deliverables, special sequencing or phased construction requirements, special hours for construction based on Client Agency programs or building occupancy, security needs, delivery dates of critical and long lead items, utility interruptions or shut down constraints for tie-ins, weather restrictions, and coordination with other project construction activities at the site shall be addressed.

This information and all general administrative information; including a narrative summary of the work for this project, ***shall be included in Division 1*** of the specification. The Consultant shall assure that there are no conflicts between the information contained in Division 1 of the specification and the DPMC General Conditions.

6. Project Schedule:

Review and update the project design and construction schedule with the Project Team members.

E. BUILDING & SITE INFORMATION

The following information shall be included in the project design documents.

1. Building Classification:

Provide the building Use Group Classification and Construction Type on the appropriate design drawing.

2. Building Block & Lot Number:

Provide the site Block and Lot Number on the appropriate design drawing.

3. Building Site Plan:

Only when the project scope involves site work, or when the design triggers code issues that require site information to show code compliance, shall a site plan be provided that is drawn in accordance with an accurate boundary line survey. The site plan shall include but not be limited to the following as may be applicable.

- The size and location of new and existing buildings and additions as well as other structures.
- The distance between buildings and structures and to lot lines.
- Established and new site grades and contours as well as building finished floor elevations.
- New and existing site utilities, site vehicular and pedestrian roads, walkways and parking areas.

4. Site Location Map:

Provide a site location map on the drawing cover sheet that identifies the vehicular travel routes from major roadways to the project construction site and the approved access roads to the Contractor's worksite staging area.

F. DESIGN MEETINGS & PRESENTATIONS

1. Design Meetings:

Conduct the appropriate number of review meetings with the Project Team members during each design phase of the project so they may determine if the project meets their requirements, question any aspect of the contract deliverables, and make changes where appropriate. The Consultant shall describe the philosophy and process used in the development of the design criteria and the various alternatives considered to meet the project objectives. Selected studies, sketches, cost estimates, schedules, and other relevant information shall be presented to support the design solutions proposed. Special considerations shall also be addressed such as: Contractor site access limitations, utility shutdowns and switchover coordination, phased construction and schedule requirements, security restrictions, available swing space, material and equipment delivery dates, etc.

It shall also be the responsibility of the Consultant to arrange and require all critical Sub-Consultants to be in attendance at the design review meetings.

Record the minutes of each design meeting and distribute within three (3) calendar days to all attendees and those persons specified to be on the distribution list by the Project Manager.

2. Design Presentations:

The minimum number of design presentations required for each phase of this project is identified below for reference:

Schematic Phase: One (1) oral presentation at phase completion.

Final Design Phase: One (1) oral presentation at phase completion.

VIII. CONSULTANT CONSTRUCTION RESPONSIBILITIES

A. GENERAL CONSTRUCTION ADMINISTRATION OVERVIEW

This section of the Scope of Work is intended as a guide for the Consultant to understand their overall basic construction administration responsibilities for the project and does not attempt to identify each specific activity or deliverable required during this phase. The Consultant shall obtain that information from the current publication of the DPMC Procedures for Architects and Engineers Manual and any additional information provided during the Consultant Selection Process.

B. PRE-BID MEETING

The Consultant shall attend, chair, record and distribute minutes of the Contractor pre-bid meetings. When bidders ask questions that may affect the bid price of the project, the Consultant shall develop a Bulletin(s) to clarify the bid documents in the format described in the Procedures for Architects and Engineers Manual, Section 9.2 entitled "Bulletins." These Bulletins must be sent to DPMC at least seven (7) calendar days prior to the bid opening date. DPMC will then distribute the document to all bidders.

C. BID OPENING

The Consultant must attend the bid opening held at the designated location.

In the event that the construction bids received exceed the Consultant's approved final cost estimate by 5% or more, the Consultant shall redesign and/or set up sufficient approved alternate designs, plans and specifications for the project work, to secure a bid that will come within the allocation specified by the State without impacting the programmatic requirements of the project. Such redesign work and

changes to plans, including reproduction costs for submission in order to obtain final approval and permits, shall be undertaken by the Consultant at no additional cost to the State.

D. POST BID REVIEW MEETING, RECOMMENDATION FOR AWARD

The Consultant; in conjunction with the Project Manager, shall review the bid proposals submitted by the various Contractors to determine the low responsible bid for the project. The Consultant; in conjunction with the Project Manager, shall develop a post bid questionnaire based on the requirements below and schedule a post bid review meeting with the Contractor's representative to review the construction costs and schedule, staffing, and other pertinent information to ensure they understand the Scope of the Work and that their bid proposal is complete and inclusive of all required to deliver the project in strict accordance with the plans and specifications.

1. Post Bid Review:

Review the project bid proposals including the alternates, unit prices, and allowances within seven (7) calendar days from the bid due date. Provide a bid tabulation matrix comparing all bids submitted and make a statement about the high, low, and average bids received. Include a comparison of the submitted bids to the approved current construction cost estimate. When applicable, provide an analysis with supporting data, detailing why the bids did not meet the construction cost estimate.

2. Review Meeting:

Arrange a meeting with the apparent low bid Contractor to discuss their bid proposal and other issues regarding the award of the contract. Remind the Contractor that this is a Lump Sum bid. Request the Contractor to confirm that their bid proposal does not contain errors. Review and confirm Alternate pricing and Unit pricing and document acceptance or rejection as appropriate.

Comment on all omissions, qualifications and unsolicited statements appearing in the proposals. Review any special circumstances of the project. Ensure the Contractor's signature appears on all post bid review documents.

3. Substitutions:

Inquire about any potential substitutions being contemplated by the Contractor and advise them of the State's guidelines for the approval of substitutions and the documentation required. Review the deadline and advise the Contractor that partial submissions are not acceptable. Submission after the deadline may be rejected by the State.

Equal substitutions that are proposed by the Contractor that are of lesser value must have a credit change order attached with the submittal (See Article 4 of the General Conditions). The State has the

right to reject the submission if there is no agreement on the proposed credit. Contractor will be responsible to submit a specified item.

4. Schedule:

Confirm that the Contractor is aware of the number of calendar days listed in the contract documents for the project duration and that the Contractor's bid includes compliance with the schedule duration and completion dates. Particular attention shall be given to special working conditions, long lead items and projected delivery dates, etc. Review project milestones (if applicable). This could give an indication of Contractor performance, but not allow a rejection of the bid.

Review the submittal timeframes per the Contract documents. Ask the Contractor to identify what products will take over twenty-eight (28) calendar days to deliver from the point of submittal approval.

5. Performance:

Investigate the past performance of Contractor by contacting Architects and owners (generally three of each) that were listed in their DPMC pre-qualification package and other references that may have been provided. Inquire how the Contractor performed with workmanship, schedule, project management, change orders, cooperation, paper work, etc.

6. Superintendent:

Remind the Contractor that a full-time non-working superintendent is required per the General Conditions, who must be responsible to address Contract issues. (Article 4.3.2.).

7. Letter of Recommendation:

The Consultant shall prepare a Letter of Recommendation for contract award to Contractor submitting the low responsible bid within three (3) calendar days from the post bid review meeting. The document shall contain the project title, DPMC project number, bid due date and expiration date of the proposal. It shall include a detailed narrative describing each post bid meeting agenda item identified above and a recommendation to award the contract to the apparent low bid Contractor based on the information obtained during that meeting. Describe any acceptance or rejection of Alternate pricing and Unit pricing.

Comment on any discussion with the Contractor that provides a sense of their understanding of the project and any special difficulties that they see, and how they might approach those problems.

Attach all minutes of the Post bid meeting and any other relevant correspondence with the Letter of Recommendation and submit them to the Project Manager.

8. Conformed Drawings:

The Consultant shall prepare and distribute two (2) sets of drawings stamped “Conformed Drawings” to the Project Manager that reflect all Bulletins and/or required changes, additions, and deletions to the pertinent drawings within twenty-eight (28) calendar days of the construction contract award date.

Any changes made in Bulletins, meeting minutes, post bid review requirements shall also be reflected in the specification.

E. DIRECTOR’S HEARING

The Consultant must attend any Director’s hearing(s) if a Contractor submits a bid protest. The Consultant shall be present to interpret the intent of the design documents and answer any technical questions that may result from the meeting. In cases where the bid protest is upheld, the Consultant shall submit a new “Letter of Recommendation” for contract award. The hours required to attend the potential hearings and to document the findings shall be estimated by the Consultant and the costs will be included in the base bid of their fee proposal.

F. CONSTRUCTION JOB MEETINGS, SCHEDULES, LOGS

The Consultant shall conduct all of the construction job meetings in accordance with the procedures identified in the A/E manual and those listed below.

1. Meetings:

The Consultant and Sub-Consultant(s) shall attend the pre-construction meeting and all construction job meetings during the construction phase of the project. The Consultant shall chair the meeting, transcribe and distribute the job-meeting minutes for every job meeting to all attendees and to those persons specified to be on the distribution list by the Project Manager. The Agenda for the meeting shall include, but not be limited to the items identified in the Procedures for Architects and Engineers Manual, Section 10.3.1, entitled “Agenda.”

Also, the Consultant is responsible for the preparation and distribution of minutes within three (3) calendar days of the meeting. The format to be used for the minutes shall comply with those identified in the “Procedures for Architects and Engineers Manual,” Section 10.3.4, entitled, “Format of Minutes.” All meeting minutes are to have an “action” column indicating the party that is responsible for the action indicated and a deadline to accomplish the assigned task. These tasks must be reviewed at each job progress meeting until it is completed and the completion date of each task shall be noted in the minutes of the meeting following the task completion.

2. Schedules:

The Consultant; with the input from the Client Agency Representative and Project Manager, shall review and recommend approval of the project construction schedule prepared by the Contractor. The schedule shall identify all necessary start and completion dates of construction, construction activities, submittal process activities, material deliveries and other milestones required to give a complete review of the project.

The Consultant shall record any schedule delays, the party responsible for the delay, the schedule activity affected, and the original and new date for reference.

The Consultant shall ensure that the Contractor provides a two (2) week “look ahead” construction schedule based upon the current monthly updated schedule as approved at the bi-weekly job meetings and that identifies the daily planned activities for that period. This Contractor requirement must also be included in Division 1 of the specification for reference.

3. Submittal Log:

The Consultant shall develop and implement a submittal log that will identify all of the required project submittals as identified in the design specification. The dates of submission shall be determined and approved by all affected parties during the pre-construction meeting.

Examples of the submissions to be reviewed and approved by the Consultant and Sub-Consultant (if required) include: shop drawings, change orders, Request for Information (RFI), equipment and material catalog cuts, spec sheets, product data sheets, MSDS material safety data sheets, specification procedures, color charts, material samples, mock-ups, etc. The submittal review process must be conducted at each job progress meeting and shall include the Consultant, Sub-Consultant, Contractor, Project Manager, and designated representatives of the Client Agency.

The Consultant shall provide an updated submittal log at each job meeting that highlights all of the required submissions that are behind schedule during the construction phase of the project.

G. CONSTRUCTION SITE ADMINISTRATION SERVICES

The Consultant and Sub-Consultant(s) shall provide construction site administration services during the duration of the project. The Consultant and Sub-Consultant(s) do not necessarily have to be on site concurrently if there are no critical activities taking place that require the Sub-Consultant's participation.

The services required shall include, but not be limited to; field observations sufficient to verify the quality and progress of construction work, conformance and compliance with the contract documents, or to attend/chair meetings as may be required by the Project Manager to resolve special issues.

A field observation visit may be conducted in conjunction with regularly scheduled construction job meetings, depending on the progress of work. The Consultant and their Sub-Consultant(s) shall submit a field observation report for each site inspection to the Project Manager. Also, they shall conduct inspections during major construction activities including, but not limited to the following examples: concrete pours, steel and truss installations, code inspections, final testing of systems, achievement of each major milestone required on the construction schedule, and requests from the Project Manager. The assignment of a full time on-site Sub-Consultant does not relieve the Consultant of their site visit obligation.

The Consultant shall refer to Section XIV. Contract Deliverables of this Scope of Work subsection entitled "Construction Phase" to determine the extent of services and deliverables required during this phase of the project.

H. SUB-CONSULTANT PARTICIPATION

It is the responsibility of the Consultant to ensure that they have provided adequate hours and/or time allotted in their technical proposal so that their Sub-Consultants may participate in all appropriate phases and activities of this project or whenever requested by the Project Manager. This includes the pre-proposal site visit and the various design meetings and construction job meetings, site visits, and close-out activities described in this Scope of Work. Field observation reports and/or meeting minutes are required to be submitted to the Project Manager within three (3) calendar days of the site visit or meeting. All costs associated with such services shall be included in the base bid of the Consultant's fee proposal.

I. DRAWINGS

1. Shop Drawings:

Each Contractor shall review the specifications and determine the numbers and nature of each shop drawing submittal. Five (5) sets of the documents shall be submitted with reference made to the appropriate section of the specification. The Consultant shall review the Contractor's shop drawing submissions for conformity with the construction documents within fourteen (14) calendar days of receipt. The Consultant shall return each shop drawing submittal stamped with the appropriate action, i.e. "Approved", "Approved as Noted", "Approved as Noted Resubmit for Records", "Rejected", etc.

2. As-Built & Record Set Drawings:

The Contractor(s) shall keep the contract drawings up to date at all times during construction and upon completion of the project, submit their AS-BUILT drawings to the Consultant with the Contractor(s) certification as to the accuracy of the information prior to final payment. All AS-BUILT drawings

submitted shall be entitled AS-BUILT above the title block and dated. The Consultant shall review the Contractor(s) AS-BUILT drawings at each job progress meeting to ensure that they are up to date. Any deficiencies shall be noted in the progress meeting minutes.

The Consultant shall acknowledge acceptance of the AS-BUILT drawings by signing a transmittal indicating they have reviewed them and that they reflect the AS-BUILT conditions as they exist.

Upon receipt of the AS-BUILT drawings from the Contractor(s), The Consultant shall obtain the original mylars from DPMC and transfer the AS-BUILT conditions to the original full sized signed mylars to reflect RECORD conditions within twenty-eight (28) calendar days of receipt of the AS-BUILT information.

The Consultant shall note the following statement on the original RECORD-SET drawings. "The AS-BUILT information added to this drawing(s) has been supplied by the Contractor(s). The (Architect) (Engineer) does not assume the responsibility for its accuracy other than conformity with the design concept and general adequacy of the AS-BUILT information to the best of the (Architect's) (Engineer's) knowledge."

Upon completion, The Consultant shall deliver the RECORD-SET original mylars to DPMC who will acknowledge their receipt in writing. This hard copy set of drawings and three (3) sets of current release AUTO CAD discs shall be submitted to DPMC and the discs shall contain all AS-BUILT drawings in both ".dwg" (native file format for AUTO CAD) and ".tif" (Tagged Image File) file formats.

J. CONSTRUCTION DEFICIENCY LIST

The Consultant shall prepare, maintain and continuously distribute an on-going deficiency list to the Contractor, Project Manager, and Client Agency Representative during the construction phase of the project. This list shall be separate correspondence from the field observation reports and shall not be considered as a punch list.

K. INSPECTIONS: SUBSTANTIAL & FINAL COMPLETION

The Consultant and their Sub-Consultant(s) accompanied by the Project Manager, Code Inspection Group, Client Agency Representative and Contractor shall conduct site inspections to determine the dates of substantial and final completion. The Project Manager will issue the only recognized official notice of substantial completion. The Consultant shall prepare and distribute the coordinated punch list, written warranties and other related DPMC forms and documents, supplied by the Contractor, to the Project Manager for review and certification of final contract acceptance.

If applicable, the punch list shall include a list of attic stock and spare parts.

L. CLOSE-OUT DOCUMENTS

The Consultant shall review all project close-out documents as submitted by the Contractors to ensure that they comply with the requirements listed in the "Procedure for Architects and Engineers' Manual." The Consultant shall forward the package to the Project Manager within twenty-eight (28) calendar days from the date the Certificate of Occupancy/Certificate of Approval is issued. The Consultant shall also submit a letter certifying that the project was completed in accordance with the contract documents, etc.

M. CLOSE-OUT ACTIVITY TIME

The Consultant shall provide all activities and deliverables associated with the "Close-Out Phase" of this project as part of their Lump Sum base bid. The Consultant and/or Sub-Consultant(s) may not use this time for additional job meetings or extended administrative services during the Construction Phase of the project.

N. TESTING, TRAINING, MANUALS, AND ATTIC STOCK

The Consultant shall ensure that all equipment testing, training sessions and equipment manuals required for this project comply with the requirements identified below.

1. Testing:

All equipment and product testing conducted during the course of construction is the responsibility of the Contractor. However, the Consultant shall ensure the testing procedures comply with manufacturers recommendations. The Consultant shall review the final test reports and provide a written recommendation of the acceptance/rejection of the material, products or equipment tested within fourteen (14) calendar days of receipt of the report.

2. Training:

The Consultant shall include in the specification that the Contractor shall schedule and coordinate all equipment training with the Project Manager and Client Agency representatives. It shall state that the Contractor shall submit the Operation and Maintenance (O&M) manuals, training plan contents, and training durations to the Consultant, Project Manager and Client Agency Representative for review and approval prior to the training session.

All costs associated with the training sessions shall be borne by the Contractor installing the equipment. A signed letter shall be prepared stating when the training was completed and must be accompanied with the training session sign-in sheet as part of the project close-out package.

3. Operation & Maintenance Manuals:

The Consultant shall coordinate and review the preparation and issuance of the equipment manuals provided by the Contractor(s) ensuring that they contain the operating procedures, maintenance procedures and frequency, cut sheets, parts lists, warranties, guarantees, and detailed drawings for all equipment installed at the facility.

A troubleshooting guide shall be included that lists problems that may arise, possible causes with solutions, and criteria for deciding when equipment shall be repaired and when it must be replaced.

Include a list of the manufacturer's recommended spare parts for all equipment being supplied for this project.

The Consultant shall ensure that the training session is videotaped by the Contractor. A transmittal copy must be presented to the Project Manager who will forward the document to the Client Agency for future reference.

A list of names, addresses and telephone numbers of the Contractors involved in the installations and firms capable of performing services for each mechanical item shall be included. The content of the manuals shall be reviewed and approved by the Project Manager and Client Agency Representative.

The Consultant shall include in the specification that the Contractor must provide a minimum of ten (10) "throwaway" copies of the manual for use at the training seminar and seven (7) hardbound copies as part of the project close-out package.

4. Attic Stock:

The Consultant shall determine and recommend whether "attic stock" should be included for all aspects of the project. If required, the Consultant shall specify attic stock items to be included in the project.

Prior to project close-out, the Consultant must prepare a comprehensive listing of all items for delivery by the Contractor to the Owner and in accordance with the appropriate specification/plan section. Items shall include, but not be limited to: training sessions, O&M manuals, as-built drawings, itemized attic stock requirements, and manufacturer guarantees/warranties.

O. CHANGE ORDERS

The Consultant shall review and process all change orders in accordance with the contract documents and procedures described below.

1. Consultant:

The Consultant shall prepare a detailed request for Change Order including a detailed description of the change(s) along with appropriate drawings, specifications, and related documentation and submit the information to the Contractor for the change order request submission. This will require the use of the current DPMC 9b form.

2. Contractor:

The Contractor shall submit a DPMC 9b Change Order Request form to the Project Manager within seven (7) calendar days after receiving the Change Order from the Consultant. The document shall identify the changed work in a manner that will allow a clear understanding of the necessity for the change. Copies of the original design drawings, sketches, etc. and specification pages shall be highlighted to clarify and show entitlement to the Change Order.

Copies shall be provided of job minutes or correspondence with all relative information highlighted to show the origin of the Change Order. Supplementary drawings from the Consultant shall be included if applicable that indicate the manner to be used to complete the changed work. A detailed breakdown of all costs associated with the change, i.e. material, labor, equipment, overhead, Sub-Contractor work, profit and bond, and certification of increased bond shall be provided.

If the Change Order will impact the time of the project, the Contractor shall include a request for an extension of time. This request shall include a copy of the original approved project schedule and a proposed revised schedule that reflects the impact on the project completion date. Documentation to account for the added time requested shall be included to support entitlement of the request such as additional work, weather, other Contractors, etc. This documentation shall contain dates, weather data and all other relative information.

3. Recommendation for Award:

The Consultant shall evaluate the reason for the change in work and provide a detailed written recommendation for approval or disapproval of the Change Order Request including backup documentation of costs in CSI format and all other considerations to substantiate that decision.

4. Code Review:

The Consultant shall determine if the Change Order request will require Code review and shall submit six (6) sets of signed and sealed modified drawings and specifications to the DPMC Plan & Code

Review Unit for approval, if required. The Consultant must also determine and produce a permit amendment request if required.

5. Cost Estimate:

The Consultant shall provide a detailed cost estimate of the proposed Change Order Request, as submitted by the Contractor, in CSI format (2004 Edition) for all appropriate divisions and subdivisions using a recognized estimating formula. The estimate shall then be compared with that of the Contractor's estimate. If any line item in the Consultant's estimate is lower than the corresponding line item in the Contractor's estimate, the Consultant in conjunction with the Project Manager is to contact the Contractor by telephone and negotiate the cost differences. The Consultant shall document the negotiated agreement on the Change Order Request form. If the Contractor's total dollar value changes based on the negotiations, the Consultant shall identify the changes on the Change Order Request form accordingly.

When recommending approval or disapproval of the change order, the Consultant shall be required to prepare and process a Change Order package that contains at a minimum the following documents:

- DPMC 9b Change Order Request
- DPMC 10 Consultant's Evaluation of Contractor's Change Order Request
- Consultant's Independent detailed Cost Estimate
- Notes of Negotiations

6. Time Extension:

When a Change Order Request is submitted with both cost and time factors, the Consultant's independent cost estimate is to take into consideration time factors associated with the changed work. The Consultant is to compare their time element with that of the Contractor's time request and if there is a significant difference, the Consultant in conjunction with the Project Manager is to contact the Contractor by telephone and negotiate the difference.

When a Change Order Request is submitted for time only, the Consultant is to do an independent evaluation of the time extension request using a recognized scheduling formula.

Requests for extension of contract time must be done in accordance with the General Conditions Section 14.2.2.

7. Submission:

The Consultant shall complete all of the DPMC Change Order Request forms provided and submit a completed package to the Project Manager with all appropriate backup documentation within seven (7) calendar days from receipt of the Contractor's change order request. The Consultant shall resubmit the

package at no cost to the State if the change order package contents are deemed insufficient by the Project Manager.

8. Meetings:

The Consultant shall attend and actively participate at all administrative hearings or settlement conferences as may be called by Project Manager in connection with such Change Orders and provide minutes of those meetings to the Project Manager for distribution.

9. Consultant Fee:

All costs associated with the potential Contractor Change Order Requests shall be anticipated by the Consultant and included in the base bid of their fee proposal.

If the Client Agency Representative requests a scope change; and it is approved by the Project Manager, the Consultant may be entitled to be reimbursed through an amendment and in accordance with the requirements stated in paragraph 10.01 of this Scope of Work.

IX. PERMITS & APPROVALS

A. REGULATORY AGENCY PERMITS

The Consultant shall comply with the following guidelines to ensure that all required permits, certificates, and approvals required by State regulatory agencies are obtained for this project.

1. NJ Uniform Construction Code Permit:

The Consultant shall complete the NJUCC permit application and all applicable technical sub-code sections with all technical site data listed. The Agent section of the application and certification section of the building sub-code section shall be signed. These documents shall be forwarded to the Project Manager who will send them to the Department of Community Affairs (DCA) and all permit application costs will be paid by DPMC from encumbered funds for the project.

The Consultant may obtain access and copies of all NJUCC Building, Fire, Plumbing, Electrical and Elevator permit applications at the following website: www.nj.gov/dca/codes

The project construction documents must comply with the latest adopted edition of the NJ Uniform Construction Code that is in effect at the Final Design Phase of this project.

All other required project permits shall be obtained and paid for by the Consultant in accordance with the procedures described in paragraph 2. below.

2. Other Regulatory Agency Permits, Certificates, and Approvals:

The Consultant shall identify and obtain all other State Regulatory Agency permits, certificates, and approvals that will govern and affect the work described in this Scope of Work. An itemized list of these permits, certificates, and approvals shall be included with the Consultant's Technical Proposal and the total amount of the application fees should be entered in the Fee Proposal line item entitled, **"Permit Fee Allowance."** See Section XIV. 6.4.8 for a preliminary list of Regulatory Agency approvals.

The Consultant may refer to the Division of Property Management and Construction "Procedures for Architects and Engineers Manual", Section 6.4.8, which presents a compendium of State permits, certificates, and approvals that may be required for this project.

The Consultant shall determine the appropriate phase of the project to submit the permit application(s) in order to meet the approved project milestone dates.

Where reference to an established industry standard is made, it shall be understood to mean the most recent edition of the standard unless otherwise noted. If an industry standard is found to be revoked, or should the standard have undergone substantial change or revision from the time that the Scope of Work was developed, the Consultant shall comply with the most recent edition of the standard.

3. Prior Approval Certification Letters:

The issuance of a construction permit for this project may be contingent upon acquiring various prior approvals as defined by NJAC 5:23-1.4. It is the Consultant's responsibility to determine which prior approvals, if any, are required. The Consultant shall submit a general certification letter to the DPMC Plan & Code Review Unit Manager during the Permit Phase of this project that certifies all required prior approvals have been obtained.

In addition to the general certification letter discussed above, the following specific prior approval certification letters, where applicable, shall be submitted by the Consultant to the DPMC Plan & Code Review Unit Manager: Soil Erosion & Sediment Control, Water & Sewer Treatment Works Approval, Coastal Areas Facilities Review, Compliance of Underground Storage Tank Systems with NJAC 7:14 b, Pinelands Review, Compliance of Abandoned Wells with NJAC 7:9-9, Certification that all utilities have been disconnected from structures to be demolished, Board of Health Approval for Potable Water Wells, Health Department Approval for Septic Systems. It shall be noted that in accordance with NJAC 5:23-2.15(a)5, a permit cannot be issued until the letter(s) of certification is received.

B. BARRIER FREE REQUIREMENTS

The Consultant, in cooperation with the Client Agency Representative, shall assure that this project complies with the NJUCC Barrier Free Sub code where applicable.

C. STATE INSURANCE APPROVAL

The Consultant shall respond in writing to the FM Global Insurance Underwriter plan review comments through the DPMC Plan & Code Review Unit Manager as applicable. The Consultant shall review all the comments and modify the documents while adhering to the project's SOW requirements, State code requirements, schedule, budget, and Consultant fee.

D. PUBLIC EMPLOYEES OCCUPATIONAL SAFETY & HEALTH PROGRAM

A paragraph shall be included in the design documents, if applicable to this project that states:
The Contractor shall comply with all the requirements stipulated in the Public Employees Occupational Safety & Health Program (PEOSHA) document, paragraph 12:100-13.5 entitled "Air quality during renovation and remodeling". The Contractor shall submit a plan demonstrating the measures to be utilized to confine the dust, debris, and air contaminants in the renovation or construction area of the project site to the Project Team prior to the start of construction.

The link to the document is: <http://www.state.nj.us/health/eoh/peoshweb/iaqstd.pdf>

E. MULTI-BUILDING OR MULTI-SITE PERMITS

A project that involves many buildings and/or sites requires that a separate permit be issued for each building or site. The Consultant must determine the construction cost estimate for *each* building and/or site location and submit that amount where indicated on the permit application.

F. PERMIT MEETINGS

The Consultant shall attend and chair all meetings with Permitting Agencies necessary to explain and obtain the required permits.

G. MANDATORY NOTIFICATIONS

The Consultant shall include language in Division 1 of the specification that states the Contractor shall assure compliance with the New Jersey “One Call” Program (1-800-272-1000) if any excavation is to occur at the project site.

The One Call Program is known as the New Jersey Underground Facility Protection Act, N.J.S.A. 48:2-73 through N.J.S.A. 48:2-91, and N.J.A.C. 14:2-1.1 through N.J.A.C. 14:2-6.4.

H. CONSTRUCTION TRAILER PERMITS

If construction trailers are required for the project then the Consultant shall include language in the Supplemental General Conditions that states the Contractor(s) shall be responsible to obtain and pay for each construction trailer permit directly from the Department of Community Affairs. (General Contractor for Single Bid-Lump Sum All Trades contract, and each Contractor for Separate Bids & Single Bid contract).

DCA will allow a single permit application to cover more than one trailer per Contractor provided the building, plumbing, and electrical technical sub-code sections, as applicable, specify the correct numbers and costs. The trailers will not require a plan review.

DCA will inspect each construction trailer and issue a Certificate of Occupancy (CO) separate from the main building construction.

Storage trailers with no utility connections are exempt from this requirement.

I. SPECIAL INSPECTIONS

In accordance with the requirements of the New Jersey Uniform Construction Code, Bulletin 03-5 and as clarified further by the Department of Community Affairs, the Consultant shall be responsible for the coordination of all special inspections during the construction phase of the project.

1. Definition:

Special inspections are defined as an independent verification by a qualified person (special Inspector) rendered to the code official for **Class I buildings only**. The special inspector is to be independent from the Contractor and responsible to the building owner or owner’s agent so that there is no possible conflict of interest.

2. Responsibilities:

The Consultant shall submit with the permit application, a list of special inspections and the firm(s) that will be responsible to carry out the inspections required for the project. The list shall be a separate document, on letter head, signed and sealed.

3. Special Inspections:

The following special inspections, as applicable to this project, shall be performed in accordance with Chapter 17 of the International Building Code, New Jersey Edition, as defined below.

- Steel construction, in accordance with Section 1704.3.
- Concrete construction, in accordance with Section 1704.4.
- Masonry construction, in accordance with Section 1704.5.
- Soils, in accordance with Section 1704.7.
- Pile foundations, in accordance with Section 1704.8.
- Seismic resistance for Design Category D buildings, in accordance with Section 1707.
- Structural testing for isolation damping systems in seismic Design Category D buildings, in accordance with Section 1708.
- A quality assurance plan for seismic resistance of seismic Design Category D buildings, in accordance with Sections 1705.1 and 1705.2.

Special inspectors shall be licensed in accordance with the requirements in the New Jersey Uniform Construction Code.

X. GENERAL REQUIREMENTS

A. SCOPE CHANGES

The Consultant must request any changes to this Scope of Work in writing. An approved DPMC 9d Consultant Amendment Request form reflecting authorized scope changes must be received by the Consultant prior to undertaking any additional work. The DPMC 9d form must be approved and signed by the Director of DPMC and written authorization issued from the Project Manager prior to any work being performed by the Consultant. Any work performed without the executed DPMC 9d form is done at the Consultant's own financial risk.

B. ERRORS AND OMISSIONS

The errors and omissions curve and the corresponding sections of the “Procedures for Architects and Engineers Manual” are eliminated. All claims for errors and omissions will be pursued by the State on an individual basis and resolved during the close-out phase of the project. The State will review each error or omission with the Consultant and determine the actual amount of damages, if any, resulting from each negligent act, error or omission.

C. ENERGY INCENTIVE PROGRAM

The Consultant shall review the Program Overview described on the NJ Smart Start Buildings website at: <http://www.njsmartstartbuildings.com/> to determine if any proposed upgrades to the mechanical and/or electrical equipment and systems for this project will qualify for the “New Jersey Smart Start Building Energy Incentive Program”.

The Consultant shall be responsible to complete the Smart Start Registration Form and the Application Forms, provide any applicable worksheets, manufacturer’s specification sheets, calculations, attend meetings, and participate in all activities with designated representatives of the Smart Start Program and Utility Companies to obtain the entitled financial incentives and rebates for this project. All costs associated with this work shall be estimated by the Consultant and the amount included in the base bid of their fee proposal.

D. AIR POLLUTION FROM ARCHITECTURAL COATINGS

The Consultant shall include in the appropriate sections of the specification the requirement that all architectural coatings applied at the project site shall comply with the NJDEP Administrative Code Title 7, Chapter 27, Subchapter 23, entitled “Prevention of Air Pollution from Architectural Coatings”.

Architectural coatings shall mean materials applied for protective, decorative, or functional purposes to stationary structures or their appurtenances, portable buildings, pavements, or curbs. The coating materials include, but are not limited to, paints, varnishes, sealers, and stains.

XI. ALLOWANCES

A. PERMIT FEE ALLOWANCE

The Consultant shall obtain and pay for all of the project permits in accordance with the guidelines identified below.

1. Permits:

The Consultant shall determine the various State permits, certificates, and approvals required to complete this project.

2. Permit Costs:

The Consultant shall determine the application fee costs for all of the required project permits, certificates, and approvals (excluding the NJ Uniform Construction Code permit) and include that amount in their fee proposal line item entitled **“Permit Fee Allowance”**. A breakdown of each permit and application fee shall be attached to the fee proposal for reference.

NOTE: The NJ Uniform Construction Code permit is excluded since it is obtained and paid for by DPMC.

3. Applications:

The Consultant shall fill out and submit all permit applications to the appropriate permitting authorities and the costs shall be paid from the Consultant’s permit fee allowance provided. A copy of the application(s) and the original permit(s) obtained by the Consultant shall be given to the Project Manager for distribution during construction.

4. Consultant Fee:

The Consultant shall determine what is required to complete and submit the permit applications, obtain supporting documentation, attend meetings, etc., and include the total cost in the base bid of their fee proposal under the “Permit Phase” column.

Any funds remaining in the permit allowance account will be returned to the State at the close of the project.

XII. SUBMITTAL REQUIREMENTS

A. CONTRACT DELIVERABLES

All submissions shall include the Contract Deliverables identified in Section XIV of this Scope of Work and described in the DPMC Procedures for Architects and Engineers Manual.

B. CATALOG CUTS

The Consultant shall provide catalog cuts as required by the DPMC Plan & Code Review Unit during the design document review submissions. Examples of catalog cuts include, but are not limited to: mechanical equipment, hardware devices, plumbing fixtures, fire suppression and alarm components, specialized building materials, electrical devices, etc.

C. PROJECT DOCUMENT BOOKLET

The Consultant shall submit all of the required Contract Deliverables to the Project Manager at the completion of each phase of the project. All reports, meeting minutes, plan review comments, project schedule, cost estimate in CSI format (2004 Edition), correspondence, calculations, and other appropriate items identified on the Submission Checklist form provided in the A/E Manual shall be presented in an 8½" x 11" bound "booklet" format.

D. DESIGN DOCUMENT CHANGES

Any corrections, additions, or omissions made to the submitted drawings and specifications at the Permit Phase of the project must be submitted to DPMC Plan & Code Review Unit as a complete document. Corrected pages or drawings may not be submitted separately unless the Consultant inserts the changed page or drawing in the original documents. No Addendums or Bulletins will be accepted as a substitution to the original specification page or drawing.

E. SINGLE-PRIME CONTRACT

All references to "separate contracts" in the Procedures for Architects and Engineers Manual, Chapter 8, shall be deleted since this project will be advertised as a "Single Bid" (Lump Sum All Trades) contract. The single prime Contractor will be responsible for all work identified in the drawings and specifications.

PROJECT NAME: CODIS Laboratory Renovation
PROJECT LOCATION: NJ State Police Technology Complex
PROJECT NO: S0542-00
DATE: July 25, 2011

The drawings shall have the required prefix designations and the specification sections shall have the color codes as specified for each trade in the DPMC Procedure for Architects and Engineers Manual.

The Consultant must still develop the Construction Cost Estimate (CCE) for each trade and the amount shall be included on the DPMC-38 Project Cost Analysis form where indicated. This document shall be submitted at each design phase of the project and updated immediately prior to the advertisement to bid.

PROJECT NAME: CODIS Laboratory Renovation
PROJECT LOCATION: NJ State Police Technology Complex
PROJECT NO: S0542-00
DATE: July 25, 2011

XIII. SOW SIGNATURE APPROVAL SHEET

This Scope of Work shall not be considered a valid document unless all signatures appear in each designated area below.

The Client Agency approval signature on this page indicates that they have reviewed the design criteria and construction schedule described in this project Scope of Work and verifies that the work will not conflict with the existing or future construction activities of other projects at the site.

SOW PREPARED BY: James W. Wright 7/25/11
JAMES WRIGHT, PROJECT MANAGER
DPMC SCOPE DEVELOPMENT UNIT DATE

SOW APPROVED BY: [Signature] 7/25/11
JAMES MCKENNA, MANAGER
DPMC SCOPE DEVELOPMENT UNIT DATE

SOW APPROVED BY: SFC Cliff Hunt 5072 7-25-2011
SFC CLIFF HUNT, PROJECT MANAGER
NEW JERSEY STATE POLICE DATE

SOW APPROVED BY: [Signature] 7/25/2011
JOSEPH PETERSACK, DIRECTOR
DNA LABORATORY, DEPARTMENT OF LAW &
PUBLIC SAFETY DATE

SOW APPROVED BY: [Signature] 7/25/11
DAVID LAPIDUS, PROJECT MANAGER
DPMC PROJECT MANAGEMENT GROUP DATE

SOW APPROVED BY: [Signature] 7/26/11
RICHARD FLODMAND, DEPUTY DIRECTOR
DIV PROPERTY MGT & CONSTRUCTION DATE

XIV.CONTRACT DELIVERABLES

The following is a listing of Contract Deliverables that are required at the completion of each phase of this project. The Consultant shall refer to the DPMC publication entitled, "Procedures for Architects and Engineers," Volumes I and II, 2nd Edition, dated January, 1991 to obtain a more detailed description of the deliverables required for each item listed below.

The numbering system used in this "Contract Deliverables" section of the scope of work corresponds to the numbering system used in the "Procedures for Architects and Engineers" manual and some may have been deleted if they do not apply to this project.

SCHEMATIC DESIGN PHASE: 25% Complete Design Documents (Minimum)

6.1 Project Schedule (Update Bar Chart Schedule)

6.2 Meetings & Minutes (Minutes within 5 working days of meeting)

6.3 Correspondence

6.4 Submission Requirements

- 6.4.1 A/E Statement of Site Visit, As-Built Drawing Verification (if available)
- 6.4.2 Space Analysis & Program Requirements
- 6.4.3 Special Features Description: security, fire protection, special structural features, exhaust, etc.
- 6.4.4 Site Evaluation
- 6.4.5 Borings, Surveys, and Soils Analysis
- 6.4.7 Design Sketches
- 6.4.8 Regulatory Agency Approvals as applicable
 - 6.4.8.1 NJ Department of Agriculture
 - (a) Soil Erosion (land disturbance over 5000 s.f.)
 - 6.4.8.2 NJ Department of Community Affairs
 - (a) UCC Permit for Building Construction
 - 6.4.8.3 NJ Department of Environmental Protection
 - 6.4.8.4 NJ Department of Health
- 6.4.9 Utility Availability for:
 - Sanitary Service
 - Domestic Water
 - Gas Service
 - Fire Service

- Electric Service
- 6.4.10 Drawings: 6 sets
 - Cover Sheet (See A/E Manual for format)
 - Site Plan
 - Site Utility Plan
 - Floor Plans
 - Elevations
 - Sections/Details
 - Structural Narrative
 - HVAC Narrative
 - Electrical Narrative
- 6.4.11 Specifications: 6 sets (See A/E Manual for format, include Division 1 and edit to describe the administrative and general requirements of the project)
- 6.4.12 Current Working Estimate in CSI Format & Cost Analysis 38 Form
- 6.4.13 Bar Chart of Design and Construction Schedule
- 6.4.14 Oral Presentation of Submission to Project Team
- 6.4.15 SOW Compliance Statement
- 6.4.16 This Submission Checklist (See A/E Manual, Figure 6.4.16 for format)
- 6.4.17 Deliverables Submission in Booklet Form: 7 sets

6.5 Approval

- 6.5.1 Respond to Submission Comments

6.6 Submission Forms

- Figure 6.4.10 Plan Review Record Sheet
- Figure 6.4.12 Current Working Estimate/Cost Analysis
- Figure 6.4.16 Submission Checklist

FINAL DESIGN PHASE 100% Complete Construction Documents

This Final Design Phase may require more than one submission based on the technical quality and code conformance of the design documents.

8.1 Schedule (Update Bar Chart Schedule)

8.2 Meeting & Minutes (Minutes within 5 working days of meeting)

8.3 Correspondence

8.4 Submission Requirements

- 8.4.1 A/E Statement of Site Visit
- 8.4.2 Space Analysis
- 8.4.3 Special Features Description: security, fire protection, special structural features, exhaust, etc.
- 8.4.4 Site Evaluation
- 8.4.5 Borings, Surveys, Soils Analysis (provided with plan submission)
- 8.4.7 Renderings and Photographs
- 8.4.8 Regulatory Agency Approvals (Include itemized list specific to this project)
- 8.4.10 Drawings: 6 sets
- 8.4.11 Specifications: 6 sets
- 8.4.12 Current Working Estimate in CSI Format & Cost Analysis 38 Form
- 8.4.13 Bar Chart of Design and Construction Schedule
- 8.4.14 Oral Presentation of this Submission to Project Team
- 8.4.15 Plan Review/SOW Compliance Statement
- 8.4.16 This Submission Checklist
- 8.4.17 Deliverables Submission in Booklet Form: 7 sets

8.5 Approvals

- 8.5.1 Respond to Submission Comments

PERMIT APPLICATION PHASE

This Permit Application Phase should not include any additional design issues. Design documents shall be 100% complete at the Final Design Phase.

8.6 Permit Application Submission Requirements

- 8.6.1 - 8.6.7: If all of the deliverables of these sections have been previously submitted to DPMC and approved there are no further deliverables due at this time
 - 8.6.8 Regulatory Agency Approvals
 - (a) UCC Permit Application & Technical Sub-codes completed by A/E
 - 8.6.9 Utility Availability Confirmation
 - 8.6.10 Signed and Sealed Drawings: 6 sets
 - 8.6.11 Signed and Sealed Specifications: 6 sets
 - 8.6.12 Current Working Estimate/Cost Analysis
 - 8.6.13 Bar Chart Schedule
 - 8.6.14 Project Presentation (N/A this Project)
 - 8.6.15 Plan Review/SOW Compliance Statement
 - 8.6.16 Submission Checklist
-

8.7 Approvals

8.8 Submission Forms

- Figure 8.4.12 Current Working Estimate/Cost Analysis
- Figure 8.4.16 Submission Checklist (Final Review Phase)
- Figure 8.6.12-b Bid Proposal Form (Form DPMC -3)
- Figure 8.6.12-c Notice of Advertising (Form DPMC -31)
- Figure 8.6.16 Submission Checklist (Permit Phase)
- Figure 8.7 Bid Clearance Form (Form DPMC -601)

BIDDING AND CONTRACT AWARD

9.0 Bidding Phase Requirements

- 9.0.1 Original Drawings signed & sealed by A/E, one (1) set AUTOCAD Discs
- 9.02 One Unbound Specification Color Coded per A/E Manual Section 8.4.11
- 9.03 Bid Documents Checklist
- 9.04 Bid Proposal Form
- 9.05 Notice for Advertising

9.1 Chair Pre-Bid Conference/Mandatory Site Visit

9.2 Prepare Bulletins

9.3 Attend Bid Opening

9.4 Recommendation for Contract Award

- 9.4.1 Prepare Letter of Recommendation for Award & Cost Analysis

9.5 Attend Pre-Construction Meeting

9.6 Submission Checklist

9.7 Submission Forms

- Figure 9.4.1 Cost Analysis
- Figure 9.6 Submission Checklist

CONSTRUCTION PHASE

10.1 Site Construction Administration

10.2 Pre-Construction Meeting

10.3 Construction Job Meetings

- 10.3.1 Agenda: Schedule and Chair Construction Job Meetings
- 10.3.2 Minutes: Prepare and Distribute Minutes within 5 working days of meeting
- 10.3.3 Schedules; Approve Contractors' Schedule & Update
- 10.3.4 Minutes Format: Prepare Job Meeting Minutes in approved format, figure 10.3.4-a

10.4 Correspondence

10.5 Prepare and Deliver Conformed Drawings

10.7 Approve Contractors Invoicing and Payment Process

10.8 Approve Contractors 12/13 Form for Subs, Samples and Materials

10.10 Approve Test Reports

10.11 Approve Shop Drawings

10.12 Construction Progress Schedule

- 10.12.1 Construction Progress Schedule

10.13 Review & Recommend or Reject Change Orders

- 10.13.1 Scope Changes
- 10.13.2 Construction Change Orders
- 10.13.3 Field Changes

10.14 Construction Photographs

10.15 Submit Field Observation Reports

10.16 Submission Forms

- Figure 10.3.4-a Job Meeting Format of Minutes
- Figure 10.3.4-b Field Report
- Figure 10.6 DPMC Insurance Form-24
- Figure 10.6-a Unit Schedule Breakdown
- Figure 10.6-b Monthly Estimate for Payment to Contractor DPMC 11-2
- Figure 10.6-c Monthly Estimate for Payment to Contractor DPMC 11-2A
- Figure 10.6-d Invoice DPMC 11
- Figure 10.6-e Prime Contractor Summary of Stored Materials DPMC 11-3
- Figure 10.6-f Agreement & Bill of Sale certificate for Stored Materials DPMC 3A
- Figure 10.7-a Approval Form for Subs, Samples & Materials DPMC 12
- Figure 10.7-b Request for Change Order DPMC 9b
- Figure 10.9 Transmittal Form DPMC 13
- Figure 10.10 Submission Checklist

PROJECT CLOSE-OUT PHASE

- 11.1 Responsibilities: Plan, Schedule and Execute Close-Out Activities**
- 11.2 Commencement: Initiate Close-Out w/DPMC 20A Project Close-Out Form**
- 11.3 Develop Punch List & Inspection Reports**
- 11.4 Verify Correction of Punch List Items**
- 11.5 Determination of Substantial Completion**
- 11.6 Ensure Issuance of “Temporary Certificate of Occupancy or Approval”**
- 11.7 Initiation of Final Contract Acceptance Process**
- 11.8 Submission of Close-Out Documentation**

- 11.8.1 As-Built & Record Set Drawings, 3 sets AUTOCAD Discs Delivered to DPMC
- 11.8.2 (a) Maintenance and Operating manuals, Warranties, etc.: 7 sets each
 - (b) Guarantees
 - (c) Testing and Balancing Reports
 - (d) Shop Drawings
 - (e) Letter of Contract Performance
- 11.8.3 Final Cost Analysis-Insurance Transfer DPMC 25

11.8.4 This Submission Checklist

11.9 Final Payment

11.9.1 Contractors Final Payment

11.9.2 A/E Invoice and Close-Out Forms for Final Payment

11.10 Final Performance Evaluation of the A/E and the Contractors

11.11 Ensure Issuance of a “Certificate of Occupancy or Approval”

11.12 Submission Forms

- Figure 11.2 Project Close-Out Documentation List DPMC 20A
- Figure 11.3-a Certificate of Substantial Completion DPMC 20D
- Figure 11.3-b Final Acceptance of Consultant Contract DPMC 20C
- Figure 11.5 Request for Contract Transition Close-Out DPMC 20X
- Figure 11.7 Final Contract Acceptance Form DPMC 20
- Figure 11.8.3-a Final Cost Analysis
- Figure 11.8.3-b Insurance Transfer Form DPMC 25
- Figure 11.8.4 Submission Checklist

XV. EXHIBITS

The attached exhibits in this section will include a sample project schedule, and any supporting documentation to assist the Consultant in the design of the project such as maps, drawings, photographs, floor plans, studies, reports, etc.

END OF SCOPE OF WORK

February 7, 1997
Rev.: January 29, 2002

Responsible Group Code Table

The codes below are used in the schedule field "GRP" that identifies the group responsible for the activity. The table consists of groups in the Division of Property Management & Construction (DPMC), as well as groups outside of the DPMC that have responsibility for specific activities on a project that could delay the project if not completed in the time specified. For reporting purposes, the groups within the DPMC have been defined to the supervisory level of management (i.e., third level of management, the level below the Associate Director) to identify the "functional group" responsible for the activity.

<u>CODE</u>	<u>DESCRIPTION</u>	<u>REPORTS TO ASSOCIATE DIRECTOR OF:</u>
CM	Contract Management Group	Contract Management
CA	Client Agency	N/A
CSP	Consultant Selection and Prequalification Group	Technical Services
A/E	Architect/Engineer	N/A
PR	Plan Review Group	Technical Services
CP	Construction Procurement	Planning & Administration
CON	Construction Contractor	N/A
FM	Financial Management Group	Planning & Administration
OEU	Office of Energy and Utility Management	N/A
PD	Project Development Group	Planning & Administration

EXHIBIT 'A'

Activity ID	Description	Reps	Weeks
<PROJ>			
Design			
CV3001	Schedule/Conduct Pre-Design/Project Kick-Off Mtg.	CM	
CV3002	Prepare Program Phase Submittal	AE	
CV3003	Distribute Program Submittal for Review	CM	
CV3007	Prepare & Submit Project Cost Analysis (DPMC-38)	CM	
CV3002	Review & Approve Program Submittal	CA	
CV3003	Review & Approve Program Submittal	PR	
CV3004	Review & Approve Program Submittal	CM	
CV3005	Consolidate & Return Program Submittal Comments	CM	
CV3006	Prepare Schematic Phase Submittal	AE	
CV3001	Distribute Schematic Submittal for Review	CM	
CV3007	Prepare & Submit Project Cost Analysis (DPMC-38)	CM	
CV3002	Review & Approve Schematic Submittal	CA	
CV3003	Review & Approve Schematic Submittal	PR	
CV3004	Review & Approve Schematic Submittal	CM	
CV3005	Consolidate & Return Schematic Submittal Comment	CM	
CV3006	Prepare Design Development Phase Submittal	AE	
CV3001	Distribute D. D. Submittal for Review	CM	
CV3007	Prepare & Submit Project Cost Analysis (DPMC-38)	CM	
CV3002	Review & Approve Design Development Submittal	CA	
CV3003	Review & Approve Design Development Submittal	PR	
CV3004	Review & Approve Design Development Submittal	CM	
CV3005	Consolidate & Return D.D. Submittal Comments	CM	
CV3006	Prepare Final Design Phase Submittal	AE	
CV3001	Distribute Final Design Submittal for Review	CM	
CV3002	Review & Approve Final Design Submittal	CA	
CV3003	Review & Approve Final Design Submittal	PR	
CV3004	Review Final Design Submittal for Constructability	OCS	

Sheet 1 of 3

Bureau of Design & Construction Services
Routine Project

DBCA - TEST

NOTE:
Refer to section "TV Project Schedule" of the
Scope of Work for contract phase durations.
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Exhibit "A"

Activity ID	Description	Reps	Weeks
CV3053	Review & Approve Final Design Submittal	CM	
CV3056	Consolidate & Return Final Design Comments	CM	
CV3060	Prepare & Submit Permit Application Documents	AE	
CV3068	Prepare & Submit Bidding Cost Analysis (DPMC 38)	CM	
Plan Review-Permit Acquisition			
CV4001	Review Constr. Documents & Secure UCC Permit	PR	
CV4010	Provide Funding for Construction Contracts	CA	
CV4020	Secure Bid Clearance	CM	
Advertise-Bid-Award			
CV5001	Advertise Project & Bid Construction Contracts	CP	
CV5010	Open Construction Bids	CP	
CV5011	Evaluate Bids & Prep. Recommendation for Award	CM	
CV5012	Evaluate Bids & Prep. Recommendation for Award	AE	
CV5014	Complete Recommendation for Award	CP	
CV5020	Award Construction Contracts/Issue NTP	CP	
Construction			
CV6000	Project Construction Start/Issue NTP	CM	
CV6001	Contract Start/Contract Work (25%) Complete	CON	
CV6002	Preconstruction Meeting	CM	
CV6003	Begin Preconstruction Submittals	CON	
CV6004	Longest Lead Procurement Item Ordered	CON	
CV6005	Lead Time for Longest Lead Procurement Item	CON	
CV6006	Prepare & Submit Shop Drawings	CON	
CV6007	Complete Construction Submittals	CON	
CV6011	Roughing Work Start	CON	
CV6012	Perform Roughing Work	CON	
CV6010	Contract Work (50%+) Complete	CON	
CV6013	Longest Lead Procurement Item Delivered	CON	
CV6020	Contract Work (75%) Complete	CON	

DBCA - TEST

Sheet 2 of 3

NOTE:
Refer to section "IV Project Schedule" of the
Scope of Work for contract phase durations.

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Bureau of Design & Construction Services
Routine Project

Exhibit "A"

Activity ID	Description	Rspn	Weeks																											
CV6014	Roughing Work Complete	CON																												
CV6021	Interior Finishes Start	CON																												
CV6022	Install Interior Finishes	CON																												
CV6030	Contract Work to Substantial Completion	CON																												
CV6031	Substantial Completion Declared	CM																												
CV6075	Complete Deferred Punch List/Seasonal Activities	CON																												
CV6079	Project Construction Complete	CM																												
CV6080	Close Out Construction Contracts	CM																												
CV6089	Construction Contracts Complete	CM																												
CV6090	Close Out A/E Contract	CM																												
CV6092	Project Completion Declared	CM																												

NOTE:

Refer to section "TV Project Schedule" of the Scope of Work for contract phase durations.

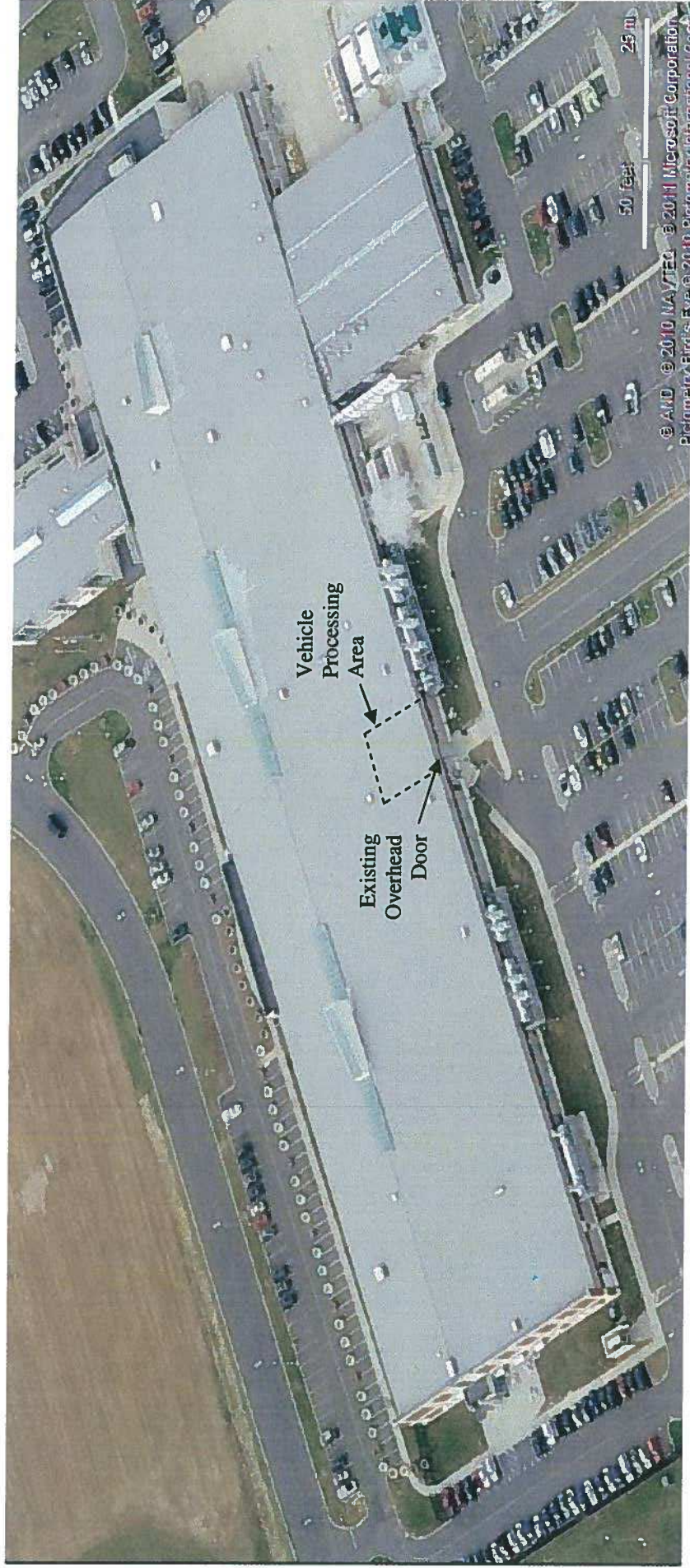
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DBCA - TEST

Sheet 3 of 3

Bureau of Design & Construction Services
Routine Project

Exhibit "A"



Hamilton Technology Center Complex
EXHIBIT 'B'

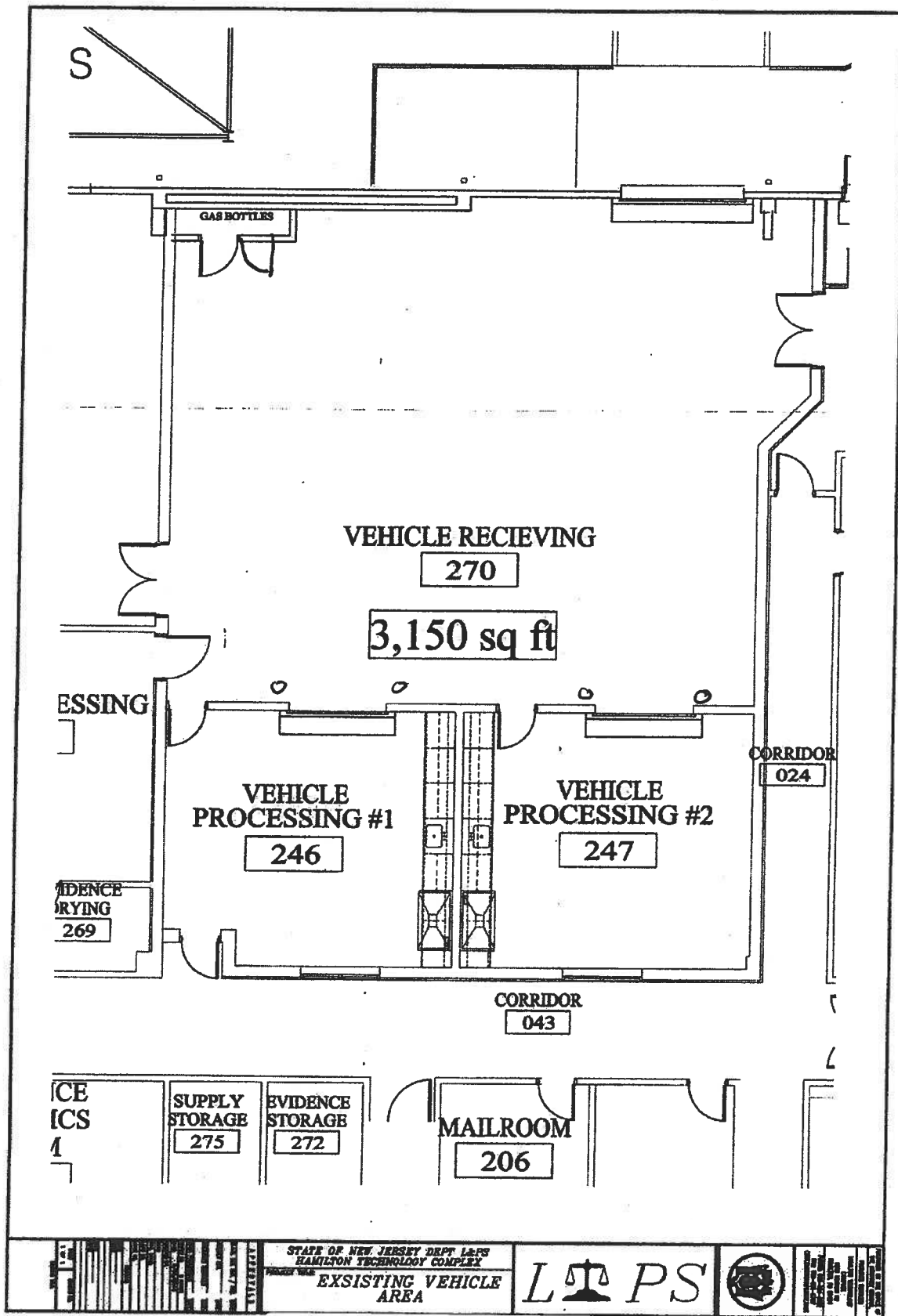
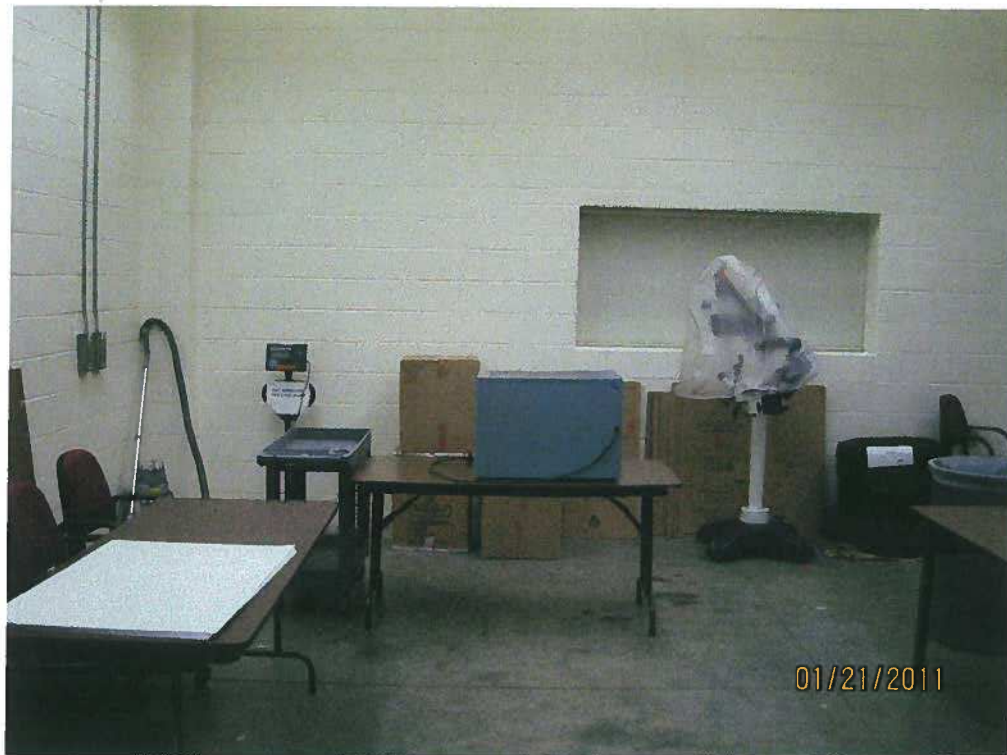


EXHIBIT 'C'



Vehicle Processing Room#1
EXHIBIT 'E'



Vehicle Processing Room #2
EXHIBIT 'E'



Ceiling in Vehicle Processing Room #2
EXHIBIT 'E'



Vehicle Receiving Area
EXHIBIT 'E'



Vehicle Rec. Area. Looking into Veh. Proc. #1(bottom)
EXHIBIT 'E'

June 6, 2011

Mr. David Lapidus
Project Design Manager
Department of the Treasury, DPMC
20 West State Street, 3rd Floor
PO Box 235
Trenton, NJ 08625-0235

re: State Police Technology Complex (CODIS)
1200 Negron Drive
Hamilton, New Jersey, 08691
Work Order No. 16
(JBCI Project No. 11-4254)

Dear Mr. Lapidus:

In accordance with our DPMC Contract No. J0259-00, Work Order No. 16, we are submitting our recommended structural scope of work on the above referenced project. Our role was to evaluate the existing building construction and offer structural recommendations to renovate an interior space to support a new CODIS DNA laboratory. We were assisted by the geotechnical engineering firm Princeton Hydro LLC, Sicklerville, NJ. This report is based on our site visit of May 15, 2011.

PROJECT PROGRAM

The New Jersey Forensic Science Technology Center located in Hamilton, N.J. houses the New Jersey State Police, Office of Forensic Sciences DNA Laboratory and the Central Regional Laboratory. This is a state of the art facility that officially opened in May of 2004. The Office of Forensic Sciences (OFS) which runs the above facility has recently obtained federal grant money to renovate the DNA laboratory. The OFS has proposed to renovate the existing garage area space in the building to relocate the in-house CODIS laboratory unit there. The current in-house CODIS laboratory occupies a small suite and shares some of its facilities with the casework DNA laboratory. It is necessary to separate the CODIS lab from the Casework DNA to allow smoother functioning of the laboratory.

The goal of the proposed renovation is to relocate the CODIS laboratory into more spacious dedicated quarters. This would require converting an existing part of the facility which contains two garage bays used for processing vehicles for physical evidence and a large open space adjacent to it, into a fully functional CODIS DNA analysis laboratory.

EXHIBIT 'F'

Mr. David Lapidus
June 6, 2011
Page 2

DESCRIPTION

The New Jersey Forensic Science Technology Center is a pre-engineered structure built circa 2001. The roof and wall structure was manufactured by Varco Pruden of Evansville, WI. The roof framing is a standing seam metal roof supported by open web steel joists at 5'-0" on center. The open web joists frame into primary building frames spaced 25 feet on center. The interior dropped ceiling and mechanical equipment is supported from above by the steel roof joists. The ground floor is a concrete slab-on-grade. The façade is a vertical metal panel system supported by horizontal steel girts with a 4'-0" high split face block wainscoting around the perimeter. The main building lateral resistance is provided by diagonal steel rods at select bays around the building perimeter.

The original intent of the renovation was to house the new department within the existing facility and support all the new ceiling and utilities from the existing roof framing. However, a May 10, 2010 report by Edwards and Kelcey concluded that the existing roof joists cannot support any additional loads. The New Jersey Department of Property Management and Construction (NJDPMC) are now reviewing the design requirements to provide a self supporting CODIS DNA facility within the existing building shell. The proposed laboratory ceiling and all utilities will be supported by new interior bearing walls. Based on this proposed layout our role is to evaluate two criteria: 1) Can the existing floor slab support the proposed cmu walls and ceiling structure; or are new footings required? and 2) Other potential structural impact of the proposed renovation on the existing facility.

SUMMARY OF FINDINGS/ANALYSIS

On May 15, 2011 representatives from our offices met with Robert M. Askew from the New Jersey Department of Law & Public Service on site to review the proposed new laboratory. In addition to our visual survey Princeton Hydro, LLC took concrete slab and subgrade soil samples for laboratory analysis.

Our site visit and laboratory testing determined the following slab on grade construction and properties (see Princeton Hydro report dated May 17, 2011 in the Appendix):

- 5" concrete slab-on-grade with welded wire fabric (Wire generally placed on the bottom).
- Concrete strength, $f'_c = 4,000$ psi
- 4-6 mil vapor barrier
- 6" gravel base
- Modulus of subgrade reaction (k_s) = 400 psi/in.
- Allowable soil bearing capacity: 3,000 psf

Based on the proposed layout, we performed a structural analysis and developed a preliminary ceiling plan. Assuming a 10 psf ceiling and equipment dead load our structural analysis indicates a maximum soil bearing pressure under the cmu walls of 600 psf, well below the allowable 3,000 psf (see attached calculations in the Appendix).

After reviewing the existing drawings the proposed new garage door entrance will interfere with diagonal steel rod lateral bracing. This was confirmed in the field.

Mr. David Lapidus
June 6, 2011
Page 3

CONCLUSIONS

Based on our field data, structural analysis and geotechnical findings, we have determined that the existing slab-on-grade can support the proposed cmu wall and ceiling loads safely without new footings. Based on the proposed layout we developed a suggested ceiling framing plan using 8" cold form steel joists as illustrated on enclosed Drawing 100. The main structural concern we have is the new garage door opening location. As shown, the proposed opening will interfere with the existing steel rod and bracing. To accommodate the new opening require the following tasks:

1. Relocate the wind bracing adjacent to the garage opening within the bay. The current diagonal bracing is set within the 25' bay. The new garage opening will cut into the bracing approximately 12'. A structural analysis is required to develop the required wind loading transfer in the remaining 13' bay width. New X-bracing and foundation uplift anchorage must be designed to fit within this space.

The suggested narrative scope of work and Construction Cost Estimate is as follows:

<u>Item</u>	<u>Cost (\$)</u>
1. Remove two existing concrete masonry unit (cmu) walls and any associated lab equipment.	\$ 4,500.00
2. Install new 8 inch thick cmu (partially grouted) walls doveled into both existing slab & walls.	\$ 12,000.00
3. Install new 8" deep ceiling steel joist framing.	\$ 6,500.00
5. Install new reflected acoustical tile ceiling below and metal deck suspended from the steel joists.	\$ 15,000.00
6. Install concrete filled steel bollards set in new concrete footings.	\$ 4,000.00
7. Reconfigure the wind bracing at the new garage opening. Temporarily remove and rebuild pipe chase cmu wall.	\$ 18,000.00
8. Install new garage opening framing and overhead door. Modify metal siding.	\$ 11,000.00
9. Install new approach driveway and curb.	\$ <u>23,000.00</u>
Subtotal	\$ 94,000.00
General Conditions (8%)	\$ 8,000.00
Contractor Overhead & Profit (20%)	\$ <u>20,000.00</u>
Current Construction Cost Estimate (CCE)	\$ 122,000.00*

* Note: The CCE does not include any professional design fees or mechanical/electrical construction costs.

JOSEPH B. CALLAGHAN, INC.
CONSULTING ENGINEERS

Mr. David Lapidus
June 6, 2011
Page 4

If I can be of further assistance, please contact me.

Submitted by



Allen Roth, P.E.

AR:ecb
enclosures

APPENDIX

- JBCI Calculations, dated May 27, 2011
- Drawing No. 100, Proposed Framing Plan
- Geotechnical Investigation, dated May 31, 2011
Prepared by Princeton Hydro, LLC

Structural Calculations

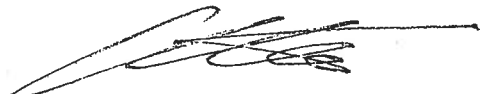
State Police Technology Complex (CODIS)
Trenton, New Jersey
DPMC Contract No. J0259-0
Work Order No. 16

Prepared by:

JOSEPH B. CALLAGHAN, INC.
Consulting Engineers
1655 Suburban Station Building
1617 John F. Kennedy Boulevard
Philadelphia, PA, 19103
(215)-665-0497

(JBCI Project No. 11-4254)

May 27, 2011



Allen Roth
Professional Engineer
NJ No. 24GE31374

Check existing slab for wall loads:

1). Check soil bearing pressure

$$P_{\text{roof}} := 15 \text{ psf}$$

uniform ceiling/roof weight

$$L_{\text{trib}} := 25.0 \text{ ft}$$

tributary width of new ceiling/roof

$$P_{8_cmu} := 47 \text{ psf}$$

uniform cmu wall weight

$$H_{\text{wall}} := 10.0 \text{ ft}$$

height of new cmu wall

$$w_{\text{slab}} := P_{\text{roof}} \cdot L_{\text{trib}} + P_{8_cmu} \cdot H_{\text{wall}}$$

uniform weight acting on slab under wall

$$w_{\text{slab}} = 845 \text{ plf}$$

Consider a 1-foot length of cmu wall:

$$t_{\text{slab}} := 5.0 \text{ in}$$

thickness of floor slab

$$P_{\text{slab}} := \frac{(w_{\text{slab}} \cdot 1.0 \text{ ft})}{(1 \text{ ft} + t_{\text{slab}}) \cdot (7.625 \text{ in} + t_{\text{slab}})}$$

uniform pressure at bottom of slab under wall

$$P_{\text{slab}} = 567 \text{ psf} \quad \text{say, } 600 \text{ psf}$$

$$P_{\text{allow}} := 3000 \text{ psf}$$

allowable uniform soil pressure per
Princeton Hydro Geotechnical Report

$$P_{\text{slab}} = 567 \text{ psf} \quad << \quad P_{\text{allow}} = 3000 \text{ psf} \quad \underline{\text{OK}}$$

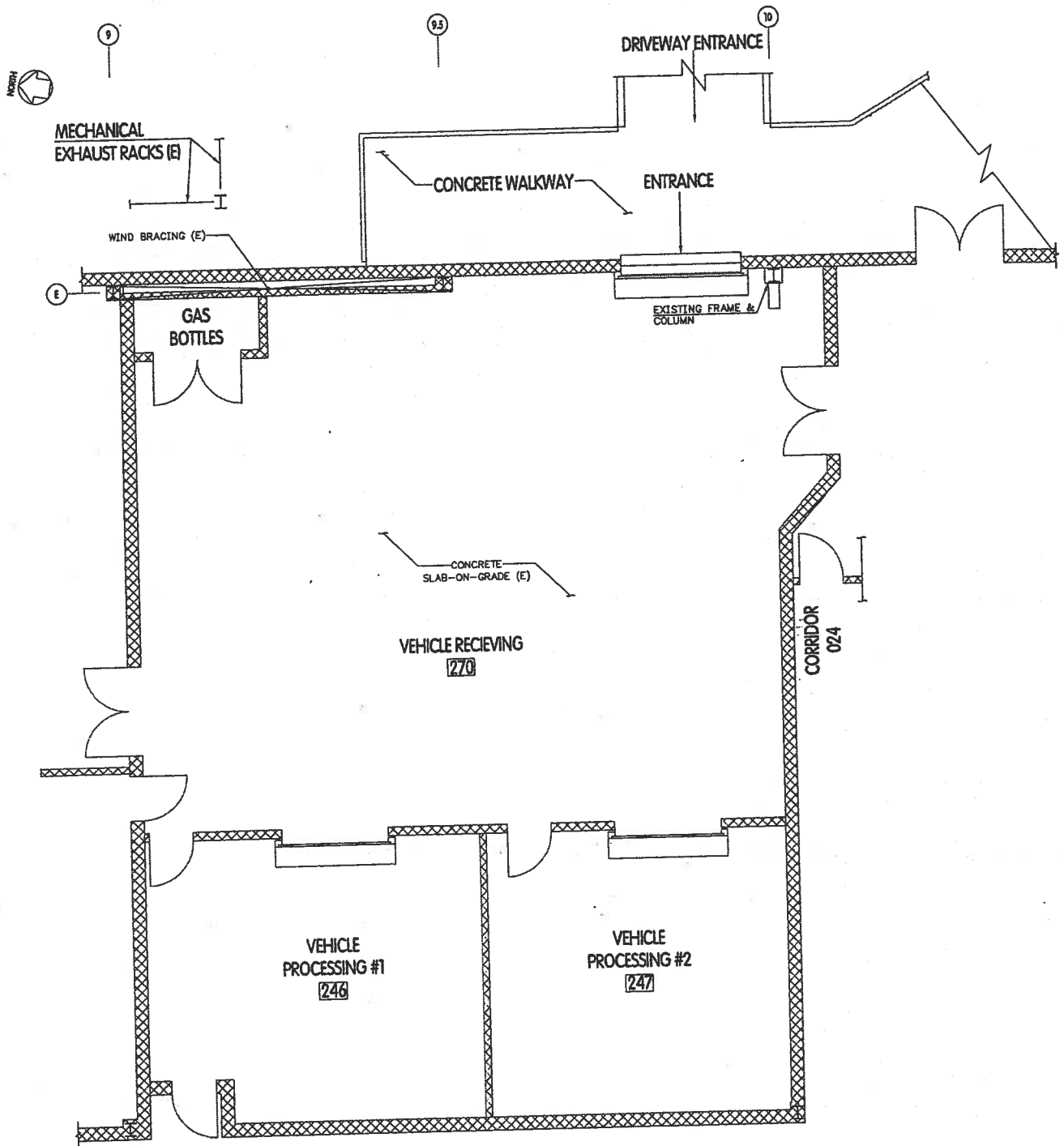
Since soil pressure due to new wall loads is less than the allowable pressure, no additional footings are required.

Check existing slab for wall loads (cont'd):

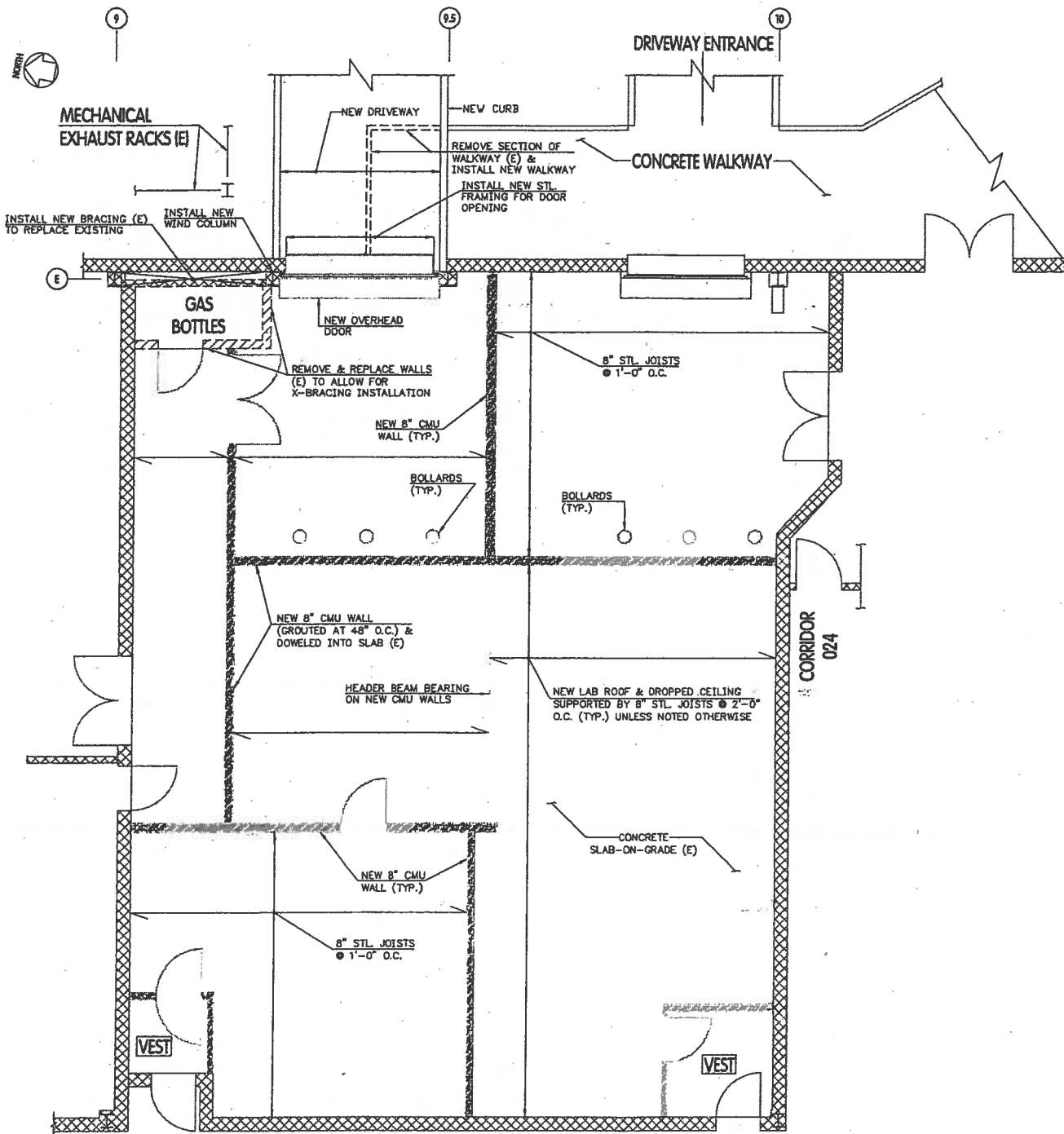
2). Check concrete slab punching shear

 $f_c := 5000$ psi compressive stress of concrete (psi) $t_{slab} := 5.0$ in thickness of floor slab (in) $\phi := .75$ punching shear capacity reduction factor $V_c := 2 \cdot \phi \cdot \sqrt{f_c} \cdot t_{slab} \cdot 12 \frac{\text{in}}{\text{ft}} \cdot \text{psi}$ punching shear capacity of slab per foot $w_{slab} = 845 \text{ plf} \lll V_c = 6364 \text{ plf}$ OK

Hence, the slab has sufficient shear capacity to withstand new wall loads.



EXISTING VEHICLE AREA
SCALE: 3/16"=1'-0"



PROPOSED LAB AREA

SCALE: $\frac{3}{16}"=1'-0"$

LEGEND:	
	SPAN DIRECTION OF JOISTS
	NEW LAB CMU WALLS
(E)	EXISTING
STL	STEEL

NO.	DATE	DESCRIPTION	BY
REVISIONS			
PROJECT			
NJSP TECHNOLOGY COMPLEX			
HAMILTON TECHNOLOGY CENTER			
HAMILTON, NJ			
PROPOSED CODIS DNA LABORATORY (W.O. No. 16)			
DRAWING TITLE			
PROPOSED FRAMING PLAN			
DRAWN	CHECKED	APPROVED	DRAWING NO.
ECB	AR	JBC	100
DATE	SCALE	PROJECT NO.	Sheet 1 of 1
5/27/11	AS SHOWN	11-4254	
JOSEPH B. CALLAGHAN, INC. - CONSULTING ENGINEERS			
1056 SUBURBAN STATION BUILDING - 1817 JOHN F. KENNEDY BLVD.			
PHILADELPHIA, PENNSYLVANIA 19103			
(215) 685-0447 FAX (215) 685-1245			

May 31, 2011

**Joseph B. Callaghan,
Incorporated***Scientists, Engineers &
Environmental Planners
Designing Innovative
Solutions for Water,
Wetland and Soil
Resource Management***Attn: Mr. Allen D. Roth, PE** ADRoth@JBCIEngineers.com
Vice President1655 Suburban Station Building
1617 John F. Kennedy Boulevard
Philadelphia, Pennsylvania 19103**RE: Geotechnical Investigation
Hamilton Technology Center
1200 Negron Drive
Township of Hamilton
Mercer County, New Jersey
pH 0447.016**

Allen,

I have completed the investigation and testing of collected materials for the above referenced project. This letter details the services provided for the determination and investigation of the suitability of the existing loading dock slab to support proposed retrofits.

1 Investigation

Princeton Hydro (pH) completed investigation and in-field sampling/testing of the concrete and soils that comprise the slab and slab support system. The investigation included the destructive sampling of concrete and soils within the loading dock area, as well as non-destructive testing of the concrete that forms the slab. The attached "Boring Location" Plan (Sheet 1 of 1) depicts discrete sampling locations in the context of the prominent loading dock features.

Concrete coring was completed at the locations depicted in the figure by-way of a pedestal mounted, electric, water cooled, diamond tipped coring machine and 10" barrel. Water and electric was supplied on-site by the facility with garden hose feeding water from an outside lock spigot. Cores advanced completely through the slab with no incipient cracking at the base of the core. The resultant cores were extracted (complete), logged, and visually inspected on-site by both pH and Joseph B. Callaghan, Incorporated (JBCI) personnel. *The extracted cores have not been tested destructively.*

The soils/construction materials below the slab were sampled by-way of manual grab and driven undisturbed (shelby) tube samplers. All samples were delivered to our AMRL facility in Sicklerville for testing and classification.

The surface of the concrete slab was further tested by way of a nondestructive rebound hammer. The unit is manufactured by NDT James Instruments (Model W-M-250, SN 40401-87923). Each location was tested with 10 rebound measurements, the highest and lowest have been discarded and the remainder averaged to provide a discrete reading at each location. The results of these tests are summarized in subsequent sections of this report.

Princeton Hydro, LLC

- ☐ 1108 Old York Road • PO Box 720 • Ringoes, NJ 08551 • t. 908.237.5660 • f. 908.237.5666
- ☒ 1200 Liberty Place • Sicklerville, NJ 08081 • t. 856.629.8889 • f. 856.629.8866
- ☐ 120 East Uwchlan Avenue • Suite 204 • Exton, PA 19341 • t. 610.524.4220 • f. 610.524.9434

1.1 USDA Soil Series

Princeton Hydro reviewed mapped soil deposits for the property and general vicinity. The following soil series are mapped under or near the site:

Sassafras Series – soils consist of very deep, moderately well-drained, marine and alluvial sediments formed in coastal plain summits and side slopes. The profile exhibits a brown to yellow (10YR 5/3) and strong brown (7.5YR 5/6) appearance and ranges in consistency, including: loam, sandy clay loam, and sandy loam with occasional gravel inclusions. The soils are strongly to extremely acid increasing with depth.

Mattapex Series – soils consist of very deep, moderately well-drained, coastal plain deposits of silty eolian and fluviomarine sediments formed upland and lowland flats. The profile exhibits a yellowish brown (10YR 5/4) to gray (2.5Y 7/2) appearance and ranges in consistency, including: silt loam, loam, and fine sandy loam. The soils are extremely to strongly acid.

Matapeake Series – soils consist of very deep, well-drained, silty eolian and coarser fluvial or marine deposits formed in coastal plain interfluvies and side slopes. The profile exhibits a yellowish brown (10YR 5/4) to strong brown (7.5YR 5/6) appearance and ranges in consistency, including: silt loam and sandy loam. The soils are strongly to very strongly acid.

1.2 Laboratory Testing

Collected samples have been tested in accordance with the following methodologies and standards:

Table 1.1: Completed Laboratory Testing

Test Methodology	Description
ASTM D2216	Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D854	Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer
ASTM D1140	Standard Test Methods for Amount of Material in Soils Finer than No. 200 (75-µm) Sieve
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D2937	Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method
ASTM D2166	Standard Test Method for Unconfined Compressive Strength of Cohesive Soil

Test results are summarized in subsequent sections of this report with data sheets and detailed testing results provided in an attachment to this report.

2 Results

The field inspection and testing program provided for this project provided insight and information into the conditions of the slab and the materials below the slab. The following subsections summarize the results.

2.1 Slab (Concrete)

Visual inspection of the cored samples reveals the following pertinent observations:

- Light-weight/size aggregate (pea-gravel), matrix appears dense and compact with no observed honeycombing, aggregation, voids, or unintended air spaces.

- Installed without a welded-wire-fabric (WWF) reinforcement layer, close visual inspection of the core reveals the concrete is fiber reinforced.
- Vapor barrier is provided at the base of the slab.
- Rebound hammer testing was completed at ten (10) discrete locations with the readings tabulated in Table 2.1 (below). The results indicate that the slab strength is greater than 5,000 pounds per square inch (psi).

Table 2.1: Rebound Hammer Testing Results

<i>Location</i>	<i>Reading</i>	<i>Strength</i>	<i>Location</i>	<i>Reading</i>	<i>Strength</i>
1	54	8,500	6	53	8,500
2	54	8,500	7	54	8,500
3	54	8,500	8	56	8,500
4	52	8,500	9	56	8,500
5	54	8,500	10	56	8,500

- The collected core samples have been tested to determine the density of the sampled concrete. Utilizing average dimensional measurements and the weight of the cores the results are detailed in Table 2.2 (below). The results indicate a relatively lightweight concrete mix.

Table 2.2: Measured Concrete Core Properties

<i>Sample</i>	<i>Average Values</i>			<i>Weight (lbs)</i>	<i>Density (pcf)</i>
	<i>Diameter (in)</i>	<i>Height (in)</i>	<i>Volume (ft³)</i>		
Core 1	5.67	4.45	0.066	8.90	134.85
Core 2	5.68	4.85	0.072	9.91	137.64

2.2 Sub-slab Materials (soils)

Visual inspection of the reveals the following pertinent observations:

- Review of USDA soils information indicates the site is underlain by natural deposits comprised of a mixture of the three (3) mapped regional soils (Sassafras, Mattapex, Matapeake series). The soils encountered are yellow brown (10YR 6/6) to brown (7.5YR 5/3) in appearance with a consistency of sandy clay (SC, USC Symbol).
- The sub-slab materials are consistent with the standard construction for slabs supported on ground. This includes a layer of gravel/dense-graded-aggregate installed over natural, compacted soils. It appears that this location may have been an area where egress to- and from- the building had been frequent as the subsoils are thoroughly mixed in with the aggregate at ST2. In addition to the observed soil mixing, was the inclusion of 3" D₅₀ (ASHTTO #57 stone) in with the other aggregate. Logs are included below:

Table 2.3: ST1 - Profile Log

Depth (in)	Description	Notes
0-4.5	Fiber reinforced concrete slab with under-slab vapor barrier.	Visual inspection of vapor barrier reveals some rupturing on underlying materials.
4.5-8.5	¾ inch washed, crushed aggregate	
8.5-32	Yellow brown (10YR 6/6) fine-medium sandy clay (SC) some to trace fine gravel.	Collected 21" shelby tube with 100% recovery.
32	End Investigation Depth No Groundwater Encountered.	

Table 2.4: ST2 - Profile Log

Depth (in)	Description	Notes
0-5.0	Fiber reinforced concrete slab with under-slab vapor barrier.	Visual inspection of vapor barrier reveals some rupturing on underlying materials.
5.0-11.0	¾ inch washed, crushed aggregate, some ASHTTO 57 stone observed. Mixed with subsoils at the base.	
11.0-22.0	Crown (7.5YR 3/4) fine-medium sandy clay (SC) some to trace fine gravel, with fine sandy clay nodules.	Collected 22" shelby tube with 100% recovery.
22	End Investigation Depth No Groundwater Encountered.	

- The laboratory testing revealed the soils are comprised of majority sand with clay, classified as sandy CLAY (SC) in accordance with the USC system. The soils are below the plastic limit at the in-situ moisture content, considered medium plasticity, and have low activity. The results are summarized below (Table 2.5, below):

Table 2.5: Laboratory Testing Results Summary

Parameter (units)	Sample	
	ST1	ST2
ASTM C851, G	2.64	2.62

<i>Parameter (units)</i>	<i>Sample</i>	
	<i>ST1</i>	<i>ST2</i>
ASTM C117 (%)	38.8	8.9
ASTM D2216 (%), W	12	15
D2166 (psi), Uc	7.231	16.57
D2166 (tsf), Su	0.26	0.60
ASTM C136		
Gravel	7.1	16.6
Sand	53.8	68.5
Fines	39.2	14.8
D4318		
PL	15	19
LL	27	37
PI	12	18
LI	0.25	0.22

3 Recommendations

As a result of the field investigation activities, field testing, and laboratory testing completed on the collected soil samples the following recommendations are provided for the design and implementation of structural retrofits for the loading dock area.

3.1 Concrete slab

The slab is in serviceable conditions with the following items of note:

- The slab comprises a fiber mesh mixture with a glass surface finish, this may affect certain floor coverings.
- The vapor barrier is ruptured in numerous areas, depending on the surface floor treatments it may be necessary to test moisture vapor emission rate (MVER, ASTM F 1869) prior to installation of any floor coverings.
- The thickness should be assumed to be a minimum of 4 inches.

Based on the results of our testing and inspection it does not appear that any systemic remedial repairs to the slab are necessary. There is a section of cracking that may be addressed; please refer to the structural report prepared by JCBI for more information with regards to that condition.

3.2 Sub-slab Materials

The slab is founded on a layer of $\frac{3}{4}$ inch washed, crushed aggregate. It appears that the loading dock entrance may have served as the primary egress for the construction project. As a result the aggregate is mixed with soil to a slightly deeper level at ST2 (immediately adjacent to the roll-up door) than in the other tested location. This could make the excavation of any foundations in that area difficult.

The soils are generally suitable for the bearing of foundations provided the bearing surface is maintained in a clean and unsaturated state. These soils will have a tendency to swell and strain soften when operated on by pneumatic equipment (directly on surface) or in a wet/saturated state. All practical efforts shall be made to minimize disturbance and saturation of materials during any construction activities.

3.3 Design Values/Parameters

It is understood that the project will include the construction of several structural load bearing and non-load bearing walls comprised of concrete masonry unit (CMU). These will be installed directly on the slab without modification, or the slab will be removed and thickened in that location. The following design parameters are utilized for the analysis of the encountered natural materials:

- Soil type – clayey SAND, SC (ASTM D2488)
- Specific Gravity (G_s) = 2.6 (ASTM D854)
- Moisture Content (w) = 13 % (ASTM D2216)
- Soil Cohesion (c) = 0.26 tsf (ASTM D2166)
- Void Ratio (e) = 0.38 (ASTM D2166)
- Internal Angle of Friction (ϕ) = 15 (assumed)
- Unit Weight, wet (γ) = 135 pcf (ASTM D7263)
- Dry Density (γ_d) = 119.5 pcf
- Saturated Density (γ_{sat}) = 137 pcf

3.3.1 Modulus of Subgrade Reaction

It was not feasible to test directly in the field for this parameter, therefore the unconfined compression test results will be utilized to provide the determination of the value. The results of the testing reveal good correlation of the two samples in the lower end of the stress/strain envelop. The Modulus of subgrade reaction (k_s) can be calculated as the slope of the initial secant modulus line; depicted in red on the attached graph. The following equation is utilized to determine an engineering design value for the modulus:

$$k_s = \frac{\Delta \sigma}{\Delta \delta} \quad (1)$$

The secant modulus line utilized is charted on the testing results. The recommended design value as a result of both the soil samples tested is **400 psi/in.**

3.3.2 Bearing Capacity

Foundations, if required, shall be designed to support the intended loads buy support on the underlying natural soils. These can be the compacted fill materials or native (undisturbed) below the slab. Interior foundations shall be installed a minimum of 18 inches below the top of the slab, *minimum of 36 inch square*, with a *bearing surface free of debris, loose soils, and deleterious materials.*

Utilizing Terzaghi's Method for the determination of ultimate bearing capacity of soils the conditions observed on site reveal the soils could support a significant load ($\pm 4,000$ psf). This is reasonable (if not slightly excessive) for this type of soil. A data sheet detailing the calculation completed is attached to this report.

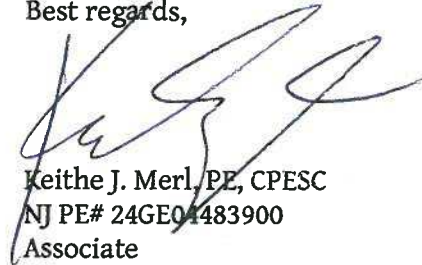
The completed testing is not adequate to assess the possible settlement of the structure. In my professional opinion, should foundations be required, a maximum allowable bearing capacity of **3,000 psf** should provide for a tolerable amount of settlement.

Should it be determined that loads will exceed those described above then additional site testing consisting of borings and in-field sampling will be required and the recommendations provided herein will need to be revised and reassessed.

4 Closing

It has been a pleasuring working on this project and I look forward to working with the Owner and design team further on this project. During construction one of my staff or myself should be on site to inspect any exposed subsurface materials prior to installation of new foundations. If walls are to be installed directly on the slab (unmodified) then there is no practical reason for our field inspection services.

Best regards,



Keith J. Merl, PE, CPESC
NJ PE# 24GE04483900
Associate

cc File
Enclosures(2)

Core Location Plan

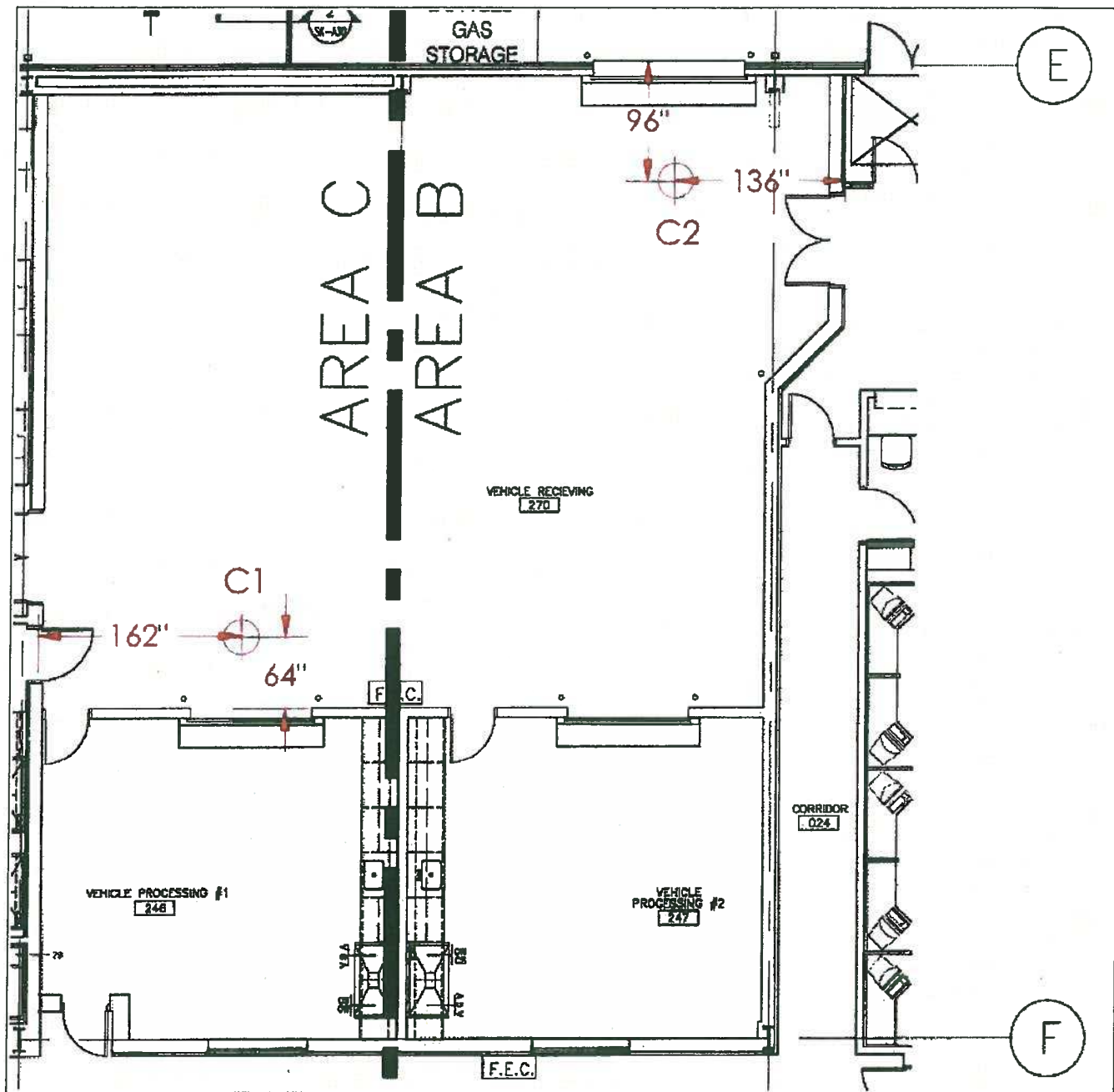


Illustration 1: Core Location Plan (NTS)

Laboratory Testing

Laboratory Testing Program

Project Name:	New Jersey State Police Technology Center		
Project Number:	0447.016	Task No.:	1
Location:	Hamilton Township, Mercer County		
Client:	JB Callaghan Inc.		
Owner:			
Client Address 1:	1200 Negrin Drive		
Client Address 2:			
Client City:	Hamilton		
Client State:	NJ		
Client Zip:	08691		
Block:			
Lot:			

Sample Information

Laboratory Number	201104150447016-1	201104150447016-2			
Exploration Number	Core 1	Core 2			
Sample Number	ST-1	ST-2			
Depth Range (ft)	0.5-2	0.7-1.2			

Requested Testing

ASTM D 2216 -05	x	x			
ASTM C 117 - 04	x	x			
ASTM C 136 - 06	x	x			
ASTM D 422 - 63 (2002)					
ASTM D 2318					
ASTM D 2434					
ASTM D 2937 - 04					
ASTM D 2974					
ASTM D 4318 - 05	x	x			

D 2216 - 05
Moisture Content

Test Method: x Method A
 Method B

Laboratory Number	201104150447016-1 201104150447016-2	
Exploration Number	Core 1	Core 2
Sample Number	ST-1	ST-2
Depth Range	0.5-2	0.7-1.2
Container/ Lid Number	20	A3
Container Mass, g (Mc)	17.3	17.7
Container + Moist Specimen Mass, g (Mcms)	657.6	537
Date / Time in oven		
Initial Container+Oven Dry Specimen Mass, g	587.6	467.5
Date / Time out of oven		
Secondary Container+Oven Dry Specimen Mass, g	587.6	467.5
Date / Time out of oven		
Final Container+Oven Dry Specimen Mass, g, (Mc _{ds})	587.6	467.5
Date / Time out of oven		
Mass of Water, g, Mw = Mcms - Mc _{ds}	70	69.5
Mass of Solids, Ms = Mc _{ds} -Mc	570.3	449.8
Water Content, %, w = (Mw/Ms)x100	12	15
Unified Soil Classification Group (Visual)		
Unified Soil Classification Group (Tested)		
Approximate maximum Grain Size		
3in		
1½ in		
¾ in		
3/8 in	x	x
#4		
#10		
< #10		
Tested Maximum Grain Size		
Oven Temperature	110	110
Remarks		
	QA/QC	
Sample Size Check: (grams less)	Adequate	Adequate
Tested by:	GA	GA
Data Entry By:	GA	GA
Data Entry Date:	05/03/11	05/03/11
Checked By:	KM	KM
Checked Date:	05/03/11	05/03/11

C 117 - 04

Material Finer than 75- μ m (no. 200) Sieve in Mineral Aggregates by Washing
 Procedure: ☒ A - Plain Water
☐ B - Wetting Agent

Laboratory Number	201104150447016-1	201104150447016-2
Exploration Number	Core 1	Core 2
Sample Number	ST-1	ST-2
Depth Range	0.5-2	0.7-1.2

§6.2 Nominal Maximum Size

4.75 mm (#4) or smaller	x	x
4.75 mm (#4) to 9.5 mm (3/8 in.)		
9.5 mm (3/8 in.) to 19.0 mm (3/4 in.)		
larger than 19.0 mm (3/4 in.)		
Minimum Mass Required (g)	300	300

§8 & 9 - Washing Specimen

Container Mass, g (Mc)	17.1	17.7
Container + Specimen Mass, g (Mcms)	380.4	257.0
B = Sample Mass, g (before wash)	363.3	239.3
Container + Dry Specimen Mass, g	239.6	235.8
C = dry mass of sample after washing (g)	222.5	218.1
Actual Mass of Solids Passing 200 Sieve (g)	140.8	21.2
§10.1 Materials passing 75- μ m (#200) sieve (%)	38.8	8.9

QA/QC

§6.2 - Weight Check:	Adequate	Inadequate
Tested by:	GA	GA
Data Entry By:	GA	GA
Data Entry Date:	05/03/11	05/03/11
Checked By:	KM	KM
Checked Date:	05/03/11	05/03/11

*NOTE: Sample size not enough

C 136 - 06
Sieve Analysis of Fine and Coarse Aggregates

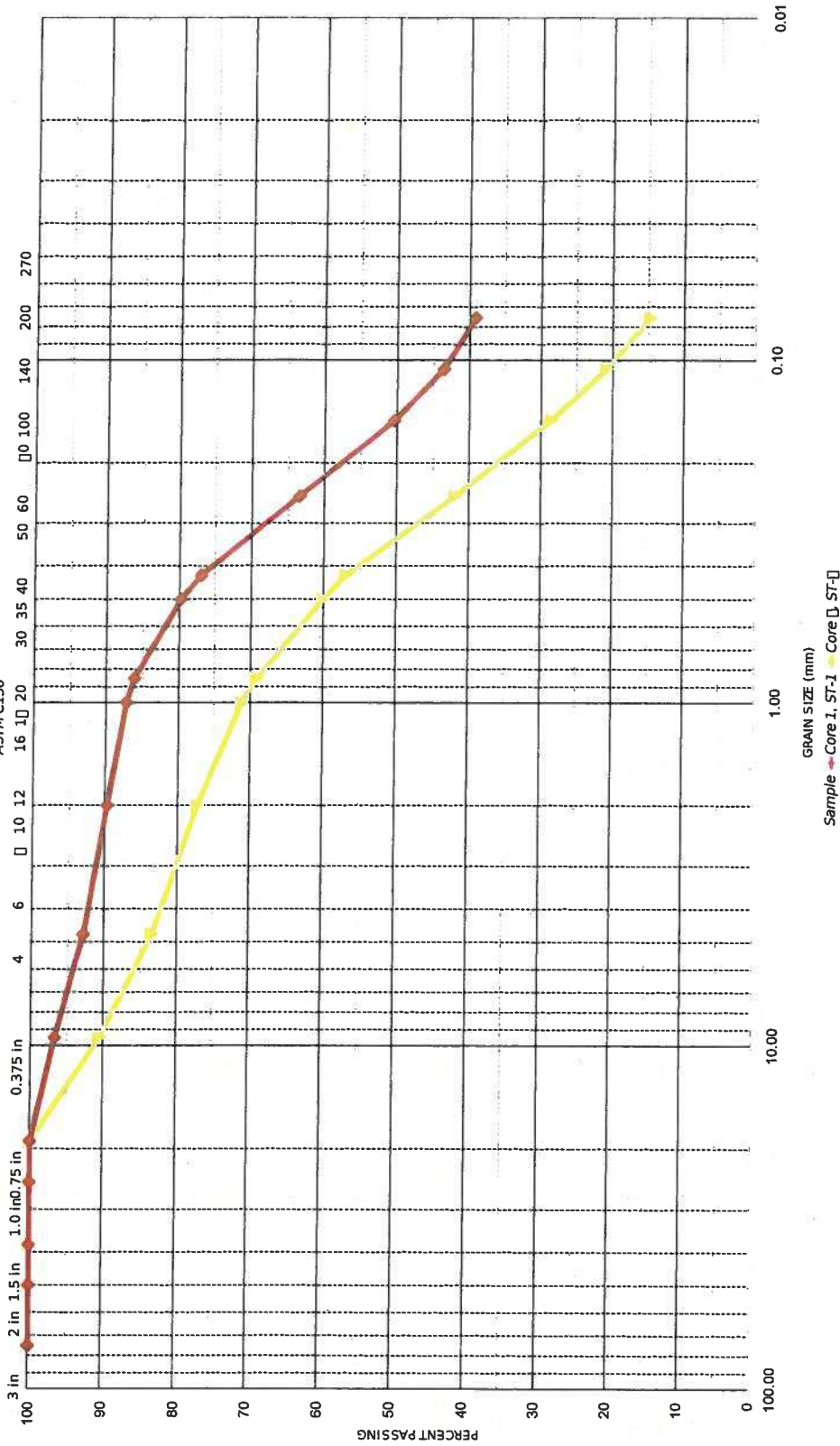
Laboratory Number	201104150447016-1 201104150447016-2	
Exploration Number	Core 1	Core 2
Sample Number	ST-1	ST-2
Depth Range	0.5-2	0.7-1.2
ASTM C 117 Data Available:	No	No
(§ 7.7) Use C 117 Info?	y	y
(§ 8.5.1) No. 1 Split?	n	n
Total Sample, g	363.1	240.8
Mass Retained on No. 10, g	36.8	32.5
Mass Used in Testing, g	363.1	240.8
	Mass Retained on Sieves, g	
3 in	0.00	0.00
2 in	0.00	0.00
1.5 in	0.00	0.00
1.0 in	0.00	0.00
0.75 in	0.00	0.00
0.375 in	11.80	13.60
4	13.60	10.10
6		
8		
10	11.40	8.80
12		
16		
18	8.90	8.70
20	3.90	3.00
30		
35	22.80	12.80
40	10.10	4.60
50		
60	48.70	21.60
80		
100	46.80	19.00
140	24.60	11.10
200	15.90	8.60
270		
Pan	3.30	1.40
	Test Results	
	Mass Passing Sieves, %	
3 in	100	100
2 in	100	100
1.5 in	100	100
1.0 in	100	100
0.75 in	100	100
0.375 in	97	90
4	93	83
6	--	--
8	--	--
10	90	77
12	--	--
16	--	--
18	87	71
20	86	69
30	--	--
35	80	60
40	77	57
50	--	--
60	63	42
80	--	--
100	50	29
140	44	21
200	39	15
270	--	--
Fineness Modulus, % _{fin}	1.14	2.11
ASTM D 2487?		
USDA/USC Description	SC, Sandy Clay	SC, Sandy Clay
	QA/QC	
Weight Consistency (§8.7):	Ok	Ok
Tested by:	GA	GA
Data Entry By:	GA	GA
Data Entry Date:	05/03/11	05/03/11
Checked By:	KM	KM
Checked Date:	05/03/11	05/03/11



Princeton Hydro

GRAIN SIZE DISTRIBUTION

ASTM C136



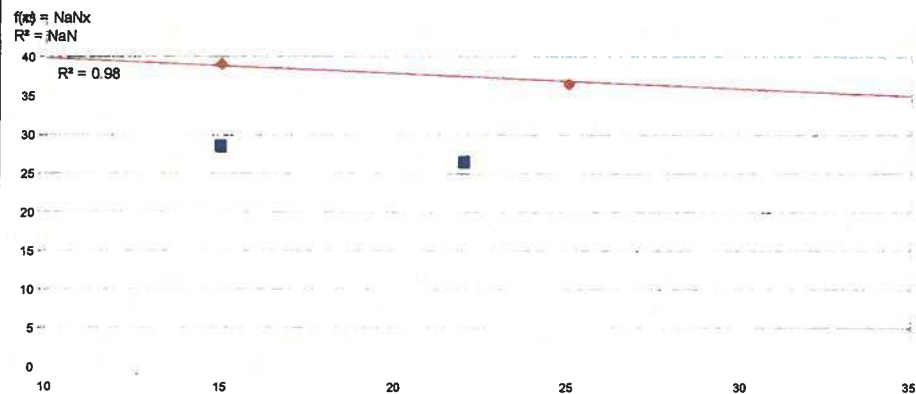
Project: 447.016 T-1, JB Callaghan Inc., New Jersey State Police Technology Center										Location: Hamilton Township, Mercer County				
Sample	Depth	% Moist. (D2216/2974)	% Org. (D2974)	Atterberg Limits (ASTM D4318)			USCS Gravel		USCS Sand		USCS % Fines		USCS	
				PI	PL	LL	% Coarse	% Fine	% Coarse	% Medium	% Fine	% Fines	Symbol, Description	USCS
Core 1, ST-1	0.5-2	12.0	NT	12.0	15.0	27.0	0.0	7.1	3.2	12.7	37.9	39.2	SC, Sandy Clay	
Core 2, ST-2	0.7-1.2	15.0	NT	37.0	18.0	19.0	0.0	16.6	6.1	20.3	42.1	14.8	SC, Sandy Clay	

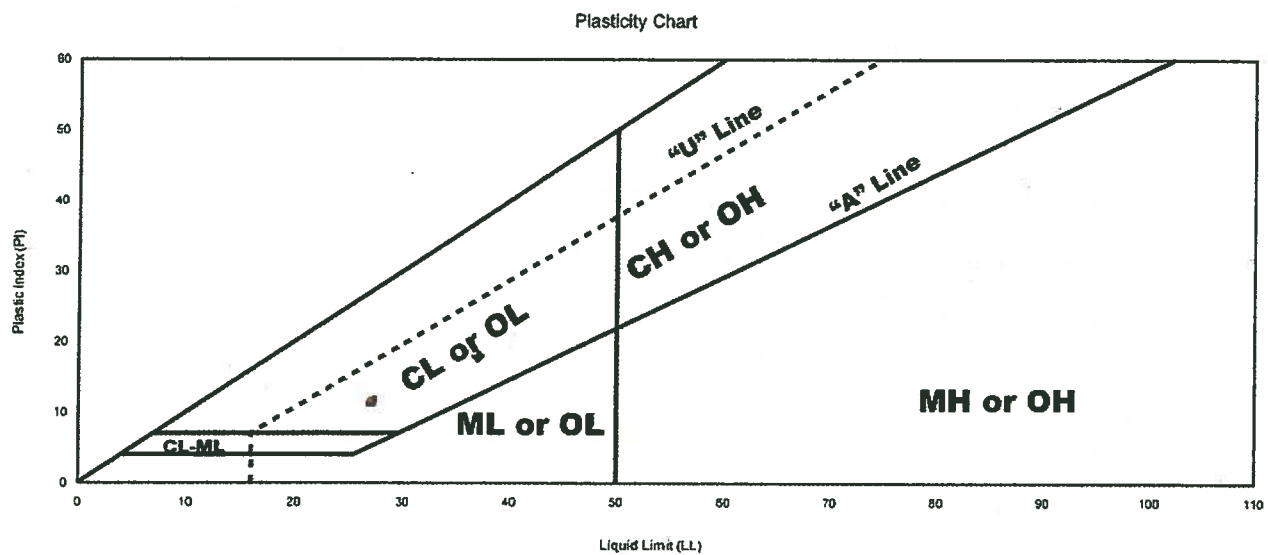
D 4318
Plasticity of Soils (Atterberg Limits)

Laboratory Number	201104150447016-1	201104150447016-2
Exploration Number	Core 1	Core 2
Sample Number	ST-1	ST-2
Depth Range	0.5-2	0-10.5-2
Soil Description		
Initial Visual Description:		
Initial Visual USCS Group Symbol:		
Approximate Max. Grain Size		
3"		
1 1/2"		
3/4"		
3/8"		
#4		
#10	x	x
<#10		
Testing Equipment		
Plastic Limit – Hand Rolled	x	x
Plastic Limit – Mechanically Rolled		
Liquid Limit – Apparatus Number		
Liquid Limit – Manual	x	x
Liquid Limit – Mechanical		
Grooving Tool – Metal	x	x
Grooving Tool – Plastic		
Specimen Preparation		
Wet	x	x
Dry (Air)		
Washed on #40		
Dry Sieved on #40	x	x
Mechanically Pushed through #40		
Mixing Water – Distilled		
Mixing Water – Demineralized		
Mixing Water – Other		
As-Received Water Content (Oven Dried)		
Mass of Tare (g)	17.3	17.7
Mass of Moist Soil and Tare (g)	657.6	537
Time in oven		
Time out of oven		
Drying Time	00:00	00:00
Mass of Dry Soil and Tare (g)	587.6	467.5
A = mass of as received test specimen (g)	640.3	519.3
B = mass of oven-dried specimen (g)	570.3	449.8
C = mass of Water (g)	70	69.5
Moisture Content (%)	12.27	15.45
Plastic Limit		
Trail 1		
Mass of Tare (g)	13.46	13.86
Mass of Moist Soil and Tare (g)	16.7	18.03
Time in oven		
Time out of oven		
Drying Time	00:00	00:00
Mass of Dry Soil and Tare (g)	16.26	17.37
A = mass of as received test specimen (g)	3.24	4.17
B = mass of oven-dried specimen (g)	2.8	3.51
C = mass of Water (g)	0.44	0.66
Moisture Content (%)	15.71	18.8
Trail 2		
Mass of Tare (g)	13.61	13.65
Mass of Moist Soil and Tare (g)	16.82	15.57
Time in oven		
Time out of oven		
Drying Time	00:00	00:00
Mass of Dry Soil and Tare (g)	16.4	15.26
A = mass of as received test specimen (g)	3.21	1.92
B = mass of oven-dried specimen (g)	2.79	1.61
C = mass of Water (g)	0.42	0.31
Moisture Content (%)	15.05	19.25

Liquid Limit		
Method		
A – Multiple Point	x	x
B – Single Point		
	Trial 1	
Mass of Tare (g)	13.64	13.54
Mass of Moist Soil and Tare (g)	22.81	23.51
Time in oven		
Time out of oven		
Drying Time	00:00	00:00
Mass of Dry Soil and Tare (g)	20.89	20.97
A = mass of as received test specimen (g)	9.17	9.97
B = mass of oven-dried specimen (g)	7.25	7.43
C = mass of Water (g)	1.92	2.54
Moisture Content (%)	26.48	34.19
Number of Blows, N	22	40
Liquid Limit – Method B	<input type="checkbox"/>	<input type="checkbox"/>
	Trial 2	
Mass of Tare (g)	13.81	13.6
Mass of Moist Soil and Tare (g)	23.67	24.06
Time in oven		
Time out of oven		
Drying Time	00:00	00:00
Mass of Dry Soil and Tare (g)	21.69	21.26
A = mass of as received test specimen (g)	9.86	10.46
B = mass of oven-dried specimen (g)	7.88	7.66
C = mass of Water (g)	1.98	2.8
Moisture Content (%)	25.13	36.55
Number of Blows, N	48	25
Liquid Limit – Method B	<input type="checkbox"/>	<input type="checkbox"/>
	Trial 3	
Mass of Tare (g)	13.87	13.52
Mass of Moist Soil and Tare (g)	23.89	30.87
Time in oven		
Time out of oven		
Drying Time	00:00	00:00
Mass of Dry Soil and Tare (g)	21.67	25.99
A = mass of as received test specimen (g)	10.02	17.35
B = mass of oven-dried specimen (g)	7.8	12.47
C = mass of Water (g)	2.22	4.88
Moisture Content (%)	28.46	39.13
Number of Blows, N	15	15
Liquid Limit – Method B	<input type="checkbox"/>	<input type="checkbox"/>
	Results	
Sample Number	Core 1, ST-1	Core 2, ST-2
Plastic Limit	15	19
Liquid Limit – Method B	NT	NT
Liquid Limit – Method A	27	37

Flow Curve Chart





Symbol
Sample Number
Liquid Limit (LL)
Plasticity Index (PI)

Core 1, ST-1
27
12

Core 2, ST-2
37
18
QA/QC

Tested by:
Data Entry By:
Data Entry Date:
Checked By:
Checked Date:

GA
GA
05/09/11
KM
05/09/11

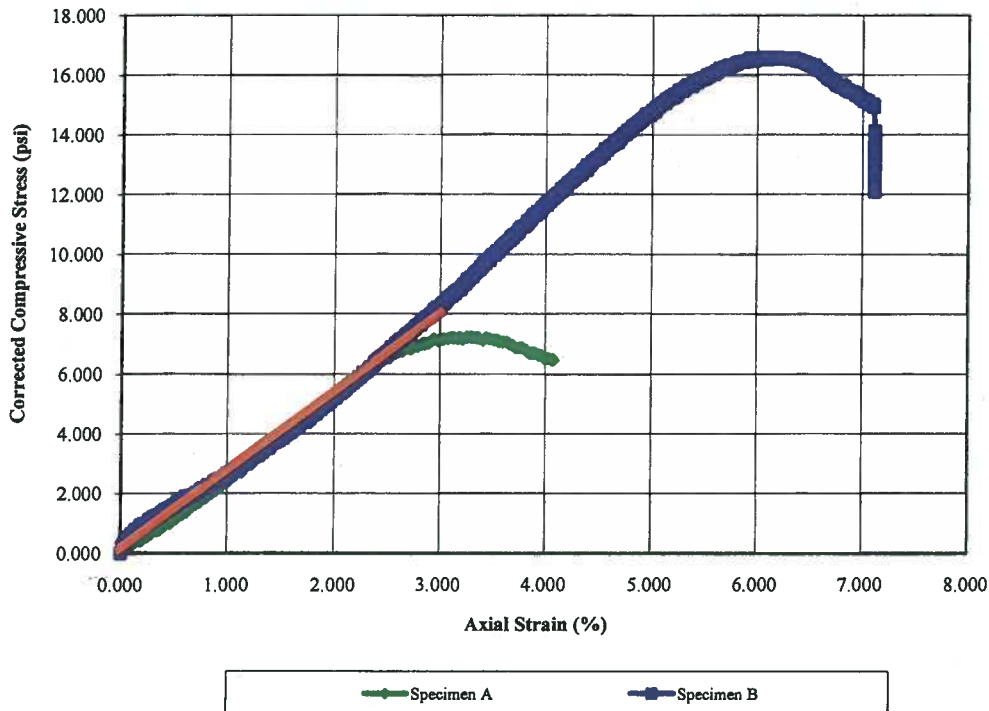
SPECIFIC GRAVITY OF SOILS

ASTM D 854

CLIENT NAME:		JB Callaghan Inc		DATE:	05/09/11
CLIENT ID #		0447.016		TECH:	GA
PH SAMPLE ID #				REVIEW:	KM
SPECIFIC GRAVITY					
Sample Identification		201104150447016-1	201104150447016-2		
Boring/Sample		ST-1	ST-2		
Depth					
pycnometer number		250	250		
mass pycnometer	Mp	99.71	99.71		
mass pycnometer, dry soil (g)	Mo	134.80	143.08		
mass pycnometer, water (g)	Ma	349.10	349.10		
mass pycnometer, water and soil (g)	Mb	370.91	375.91		
temperature (°C)	Tb	20.30	17.90		
specific gravity	G	2.642	2.619		

Princeton Hydro, Inc.
Unconfined Compression Test Report (ASTM D2166)

Compressive Stress Axial Strain Curve



Before Test	Specimen			
	A	B	C	D
Water Content (%)	12.27	15.45		
Dry Density (pcf)	118.600	119.400		
Saturation (%)	83.02	109.50		
Void Ratio	0.39	0.37		
Diameter (in)	2.750	2.750		
Height (in)	6.000	6.000		
Test Data	A	B	C	D
Unconfined Strength (psi)	7.231	16.569		
Undrained Shear Strength (tsf)	0.260	0.596		
Undrained Shear Strength (psi)	3.616	8.284		
Rate of Strain (in/min)	0.110000	0.050000		
Strain at Failure (%)	3.26	6.19		
Description				
Project Information		Specimen Description		
Project Num	0447.016	Specimen A	ST-1, YB (10YR6/6) Sandy Clay (SC)	
Project	NJ Technology Center	Specimen B	ST-2, Brown (7.5YR4/3) Sandy Clay (SC)	
Sampling Date	4/15/2011	Specimen C		
Sample #	Soil Cores	Specimen D		
Client	JB Callaghan Inc.	Test Variables		
		Specific Gravity	2.64	
		Liquid Limit:	27.0	
		Plastic Limit:	15.0	

Remarks

Calculation Sheets

Ultimate Bearing Capacity Calculations-Spread Footing

Bold Variables (with blue text) need to be entered, italicized are collected from Previous Entries.

Terzaghi Method (1943) – Ref. EM 1110-1-1905

Variables	$q_u = cN_c \zeta_c + \left(\frac{1}{2}\right) B' \gamma' H N_\gamma \zeta_\gamma + \sigma' D N_q \zeta_q$	
c =	0.52	soil cohesion intercept, ksf
φ' =	15	soil internal angle of friction, degrees
B' =	0.9	minimum effective width of foundation, B-2e, ft
Type =	square	type of foundation proposed (type in strip, square, or circle)
B =	3	width of foundation, ft
e =	1.05	eccentricity parallel with foundation width, ft
γ'H =	0.14	effective unit weight of soil beneath foundation base within the failure zone, kips/ft ³
σ'D =	0.21	effective soil or surcharge pressure at the foundation depth D, γ'd*D, ksf
γ'D =	0.14	effective unit weight of soil from the ground surface to foundation depth D, kips/ft ³
D =	1.5	foundation depth, ft
N_q =	4.45	
N_c =	12.86	dimensionless bearing capacity factors of cohesion c, soil weight of failure wedge γ (Coduto, Donald (2001), Foundation Design, Prentice-Hall, ISBN 0-13-589706-8), and surcharge q terms
N_γ =	2.17	
ζ_q =	1.0	dimensionless correction factors of cohesion c, soil weight in failure wedge γ, and surcharge q
ζ_c =	1.3	(Bowles 1988) accounting for foundation geometry and soil type
ζ_γ =	0.8	
q_u =	9.73 ksf	
	9733.26 psf	
	4.87 tsf	