SCOPE OF WORK

Roof Repairs

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

Project No. S0651-00

STATE OF NEW JERSEY

Honorable Philip D. Murphy, Governor
Honorable Sheila Y. Oliver, Lt. Governor

DEPARTMENT OF THE TREASURY

Elizabeth Maher Muoio, Treasurer

DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION

Christopher Chianese, Director

Date: July 26, 2023

Document Format Revision 8-1-2022

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SECTION **PAGE**

I. OBJECTIVE

The objective of this project is to repair and strengthen the roofing system at the New Jersey State Police Technology Complex in Hamilton.

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 following discipline(s):

- **P001 Architecture**

The Consultant shall also have in-house capabilities or Sub-Consultants pre-qualified with DPMC in:

- **P007 Structural Engineering**
- **P025 Estimating/Cost Analysis**

As well as, **any and all** other Architectural, 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 $7,058,995.

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

B. CURRENT WORKING ESTIMATE (CWE)

The Current Working Estimate (CWE) for this project is $8,469,844.

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. 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. Site Access Approvals & Schedule Design Kick-off Meeting	**14**
2. Schematic Design Phase	**42**
• *Project Team & DPMC Plan/Code Unit Review & Comment*	14
3. Design Development Phase	**42**
• *Project Team & DPMC Plan/Code Unit Review & Comment*	14
4. Final Design Phase	**42**
• *Project Team & DPMC Plan/Code Unit Review & Approval*	14
5. Final Design Re-Submission to Address Comments	**7**
• *Project Team & DPMC Plan/Code Unit Review & Approval*	14
6. DCA Submission Plan Review	**30**
7. Permit Application Phase	**7**
• *Issue Plan Release*	
8. Bid Phase	**42**
9. Award Phase	**28**

10. Construction Phase **180**

11. Project Close Out Phase **30**

B. CONSULTANT'S PROPOSED DESIGN & CONSTRUCTION SCHEDULE

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

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.

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 location map.

B. PROJECT TEAM MEMBER DIRECTORY

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

1. DPMC Representative:

Name:	Andrew Daniels, Project Manager
Address:	Division of Property Management & Construction
	20 West State Street, 3rd Floor
	Trenton, NJ 08608-1206
Phone No:	(609) 777-1874, cell: (609) 947-5104
E-Mail:	andrew.daniels@treas,nj,gov

2. New Jersey State Police Representative:

Name:	Sgt. Christopher Ramellini #6526
Address:	New Jersey State Police
	Operations Unit
	Facilities and Asset Control Bureau
Phone No:	(609) 882-2000 ext. 2407 cell: (732) 547-5595
E-Mail:	Christopher.Ramellini@njsp.gov

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.

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 main part of the building is divided into four zones

labeled "A" through "D'. Two wings, labeled "E" and "F", measure 135 feet by 135 feet and 84 feet by 148 feet respectively. This project is focused on the main part of the building only. See **Exhibit 'C'**.

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 facade 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.

A May, 2010 structural analysis of the building by Edwards and Kelcey indicated that the roof cannot support additional loads. The roof was designed for allowable deflections that have resulted in the need for a special maintenance program. Snow accumulations have to be manually removed to avoid overstressing the structure. This project has been created to address the problem and strengthen the roof system. See **Exhibit 'D'** for a narrative of the Edwards and Kelcey report. Attachments from the report will be provided to the Consultant at the preproposal meeting.

As a result of the change of plans from the original intent of the building, there are three roof hatches that are inconveniently located. For security and safety reasons, the ladders to the hatches have been removed and the hatches are no longer used. Access to the roof is from the outside with a portable ladder. The facility staff would like to have access to the roof through conveniently located hatches or some other means.

VII. CONSULTANT DESIGN RESPONSIBILITIES

A. DESIGN REQUIREMENTS

1. General:

The Consultant shall provide the design, specifications, bid/award and construction administration services to repair and strengthen the roof at the NJ State Police Technology Complex in Hamilton. The Consultant shall analyze the structure and provide recommendations to strengthen the roof. Repairs to the metal roof shall also be recommended and implemented.

2. Roof Access:

The Consultant shall provide the design, specifications, bid/award and construction administration services to create access to the roof. This can be through creation of new conveniently located roof hatches or some other means.

B. EXISTING DOCUMENTATION

Copies of the following documents will be provided to each Consulting firm at the pre-proposal meeting to assist in the bidding process.

- ODC Project A0833-01: Pre-Engineered Building Drawings, L. Robert Kimball & Associates, 10/5/99
- ODC Project A0833-01: Bid Documents, September 28, 1999
- Hamilton Technology Complex Floor Plan, CAD Drawing
- Structural Analysis of Pre-Engineered Building Roof, May 10, 2010, Edwards and Kelcey
- Skylight Caulking Repair Recommendations, November 2009, Roof Maintenance Systems

Review these documents and any 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.

VIII. PERMITS & APPROVALS

A. NJ UNIFORM CONSTRUCTION CODE PLAN REVIEW AND PERMIT

The project construction documents must comply with the latest adopted edition of the NJ Uniform Construction Code (NJUCC).

The latest NJUCC Adopted Codes and Standards can be found at:

http://www.state.nj.us/dca/divisions/codes/codreg/

1. NJ Uniform Construction Code (NJUCC) Plan Review

Consultant shall estimate the cost of the NJUCC Plan Review by DCA and include that amount in their fee proposal line item entitled **"Plan Review and Permit Fee Allowance"**, refer to paragraph XI.A.

Upon approval of the Final Design Phase Submission by DPMC, the Consultant shall submit the construction documents to the Department of Community Affairs (DCA), Bureau of Construction Project Review to secure a complete plan release.

As of July 25, 2022, the Department of Community Affairs (DCA) is only accepting digital signatures and seals issued from a third party certificate authority. The DCA ePlans site can be found at:

https://www.nj.gov/dca/divisions/codes/offices/ePlans.html

Procedures for submission to the DCA Plan Review Unit can be found at:

https://www.state.nj.us/dca/divisions/codes/forms/pdf_bcpr/pr_app_guide.pdf

Consultant shall complete the "Project Review Application" and include the following on Block 5 as the "Owner's Designated Agent Name":

Joyce Spitale, DPMC
PO Box 235
Trenton, NJ 08625-0235
Joyce.Spitale@treas.nj.gov 609-943-5193

The Consultant shall complete the NJUCC "Plan Review Fee Schedule", determine the fee due and pay the NJUCC Plan Review fees, refer to Paragraph X.A.
The NJUCC "Plan Review Fee Schedule" can be found at:

http://www.state.nj.us/dca/divisions/codes/forms/pdf_bcpr/pr_fees.pdf

2. NJ Uniform Construction Code Permit

Upon receipt of a complete plan release from the DCA Bureau of Construction Project Review, the Consultant shall complete the NJUCC permit application and all applicable technical sub-code sections. The "Agent Section" of the application and certification section of the building sub-code section shall be signed. These documents, with **six (6) sets of DCA approved, signed and sealed construction documents** shall be forwarded to the DPMC Project Manager.

The Consultant may obtain copies of all NJUCC permit applications at the following website:

http://www.state.nj.us/dca/divisions/codes/forms/

All other required project permits shall be obtained and paid for by the Consultant in accordance with the procedures described in Paragraph VIII.B.

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 N.J.A.C. 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 N.J.A.C. 7:14B, Pinelands Commission, Highlands Council, Well Construction and Maintenance; Sealing of Abandoned Wells with N.J.A.C. 7:9D, 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 N.J.A.C. 5:23-2.15(a)5, a permit cannot be issued until the letter(s) of certification is received.

4. Multi-building or Multi-site Permits:

A project that involves many buildings and/or sites requires that a separate permit shall 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.

5. Special Inspections:

In accordance with the requirements of the New Jersey Uniform Construction Code N.J.A.C. 5:23-2.20(b), Bulletin 03-5 and Chapter 17 of the International Building Code, the Consultant shall be responsible for the coordination of all special inspections during the construction phase of the project.

Bulletin 03-5 can be found at:

http://www.state.nj.us/dca/divisions/codes/publications/pdf_bulletins/b_03_5.pdf

a. Definition:

Special inspections are defined as an independent verification by a certified Special Inspector for **Class I buildings and smoke control systems in any class building**. The special inspector is to be independent from the Contractor and responsible to the Consultant so that there is no possible conflict of interest.

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

b. Responsibilities:

The Consultant shall submit with the permit application, a list of special inspections and the agencies or special inspectors 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.

B. 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."**

The Consultant may refer to the Division of Property Management and Construction "Procedures for Architects and Engineers Manual", Paragraph "**9. REGULATORY AGENCY APPROVALS"** 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.

IX. ALLOWANCES

A. PLAN REVIEW AND 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 permits, certificates, and approvals required to complete this project.

2. Permit Costs:

The Consultant shall estimate 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 its fee proposal line item entitled **"Plan Review and Permit Fee Allowance"**, refer to Paragraph IX.A. 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 will be paid for by the State.

3. Applications:

The Consultant shall complete and submit all permit applications to the appropriate permitting authorities and the costs shall be paid from the Consultant's permit fee allowance. A copy of the application(s) and the original permit(s) obtained by the Consultant shall be given to the DPMC 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 its fee proposal under the "Permit Phase" column.

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

X. 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 (including the subsequent contract deliverables and exhibits) and verifies that the work will not conflict with the existing or future construction activities of other projects at the site.

SOW APPROVED BY: James Wright 7/26/2023

JAMES WRIGHT, MANAGER DATE
DPMC PROJECT PLANNING & INITIATION

SOW APPROVED BY: Christopher Ramellini 7/26/2023

CHRISTOPHER RAMELLINI, SERGEANT DATE
NEW JERSEY STATE POLICE

SOW APPROVED BY: Andrew Daniels 7/27/2023

ANDREW DANIELS, PROJECT MANAGER DATE
DPMC PROJECT MANAGEMENT GROUP

SOW APPROVED BY: Richard S Flodmand 8/17/2023

RICHARD FLODMAND, DEPUTY DIRECTOR DATE
DIV PROPERTY MGT & CONSTRUCTION

XI. CONTRACT DELIVERABLES

The following are checklists listing the 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," 3.0 Edition, dated September 2022 available at https://www.nj.gov/treasury/dpmc/Assets/Files/ProceduresforArchitectsandEngineers.pdf for a detailed description of the deliverables required for each submission item listed. References to the applicable paragraphs of the "Procedures for Architects and Engineers" are provided.

Note that the Deliverables Checklist may include submission items that are "S.O.W. Specific Requirements". These requirements will be defined in the project specific scope of work and included on the deliverables checklist.

This project includes the following phases with the deliverables noted as "Required by S.O.W" on the Deliverables Checklist:

- **SCHEMATIC DESIGN PHASE**
- **DESIGN DEVELOPMENT PHASE**
- **FINAL DESIGN PHASE**
- **PERMIT APPLICATION PHASE**
- **BIDDING AND CONTRACT AWARD**
- **CONSTRUCTION PHASE**
- **PROJECT CLOSE-OUT PHASE**

XII. EXHIBITS

A. SAMPLE PROJECT SCHEDULE FORMAT
B. PROJECT SITE LOCATION MAP
C. BUILDNG ZONES
D. STRUCTURAL ANALYSIS OF PRE-ENGINEERED BUILDING ROOF
E. PHOTOS

END OF SCOPE OF WORK

DPMC Project No.: S0651-00

Deliverables Checklist
Schematic Design Phase

A/E Name: _____

A/E Manual Reference	Submission Item	Required by S.O.W.		Previously Submitted		Enclosed	
		Yes	No	Yes	No	Yes	No
13.4.1.	A/E Statement of Site Visit						
13.4.2.	Narrative Description of Project						
13.4.3.	Building Code Information Questionnaire						
13.4.4.	Space Analysis						
13.4.5.	Special Features						
13.4.6.	Catalog Cuts						
13.4.7.	Site Evaluation						
13.4.8.	Subsurface Investigation						
13.4.9.	Surveys						
13.4.10.	Arts Inclusion						
13.4.11.	Design Rendering						
13.4.12.	Regulatory Approvals						
13.4.13.	Utility Availability						
13.4.14.	Drawings (6 Sets)						
13.4.15.	Outline Specifications (6 Sets)						
13.4.16.	Current Working Estimate/Cost Analysis						
13.4.17.	Project Schedule						
13.4.18.	Formal Presentation						
13.4.19.	Scope of Work Compliance Statement						
13.4.20.	Schematic Design Phase Deliverables Checklist						
S.O.W. Reference	**S.O.W. Specific Requirements**						

This checklist shall be completed by the Design Consultant and included as the cover sheet of this submission to document to the DPMC the status of all the deliverables required by the project specific Scope of Work.

_____ _____

Consultant Signature Date

DPMC Project No.: S0651-00

Deliverables Checklist
Design Development Phase

A/E Name: _____

A/E Manual Reference	Submission Item	Required by S.O.W.		Previously Submitted		Enclosed	
		Yes	No	Yes	No	Yes	No
14.4.1.	A/E Statement of Site Visit						
14.4.2.	Narrative Description of Project						
14.4.3.	Building Code Information Questionnaire						
14.4.4.	Space Analysis						
14.4.5.	Special Features						
14.4.6.	Catalog Cuts						
14.4.7.	Site Evaluation						
14.4.8.	Subsurface Investigation						
14.4.9.	Surveys						
14.4.10.	Arts Inclusion						
14.4.11.	Design Rendering						
14.4.12.	Regulatory Approvals						
14.4.13.	Utility Availability						
14.4.14.	Drawings (6 Sets)						
14.4.15.	Outline Specifications (6 Sets)						
14.4.16.	Current Working Estimate/Cost Analysis						
14.4.17.	Project Schedule						
14.4.18.	Formal Presentation						
14.4.19.	Plan Review/Scope of Work Compliance Statement						
14.4.20.	Design development Phase Deliverables Checklist						
S.O.W. Reference	**S.O.W. Specific Requirements**						

This checklist shall be completed by the Design Consultant and included as the cover sheet of this submission to document to the DPMC the status of all the deliverables required by the project specific Scope of Work.

_____ _____

Consultant Signature Date

DPMC Project No.: S0651-00

Deliverables Checklist
Final Design Phase

A/E Name: _____

A/E Manual Reference	Submission Item	Required by S.O.W.		Previously Submitted		Enclosed	
		Yes	No	Yes	No	Yes	No
15.4.1.	A/E Statement of Site Visit						
15.4.2.	Narrative Description of Project						
15.4.3.	Building Code Information Questionnaire						
15.4.4.	Space Analysis						
15.4.5.	Special Features						
15.4.6.	Catalog Cuts						
15.4.7.	Site Evaluation						
15.4.8.	Subsurface Investigation						
15.4.9.	Surveys						
15.4.10.	Arts Inclusion						
15.4.11.	Design Rendering						
15.4.12.	Regulatory Approvals						
15.4.13.	Utility Availability						
15.4.14.	Drawings (6 Sets)						
15.4.15.	Outline Specifications (6 Sets)						
15.4.16.	Current Working Estimate/Cost Analysis						
15.4.17.	Project Schedule						
15.4.18.	Formal Presentation						
15.4.19.	Plan Review/Scope of Work Compliance Statement						
15.4.20.	Final Design Phase Deliverables Checklist						
S.O.W. Reference	**S.O.W. Specific Requirements**						

This checklist shall be completed by the Design Consultant and included as the cover sheet of this submission to document to the DPMC the status of all the deliverables required by the project specific Scope of Work.

_____ _____

Consultant Signature Date

DPMC Project No.: S0651-00

Deliverables Checklist
Permit Application Phase

A/E Name: _____

A/E Manual Reference	Submission Item	Required by S.O.W.		Previously Submitted		Enclosed	
		Yes	No	Yes	No	Yes	No
16.1.	N.J. UCC Permit Application						
16.4.	Drawings, Signed and Sealed (6 Sets)						
16.5.	Specifications, Signed and Sealed (6 Sets)						
16.6.	Current Working Estimate/Cost Analysis						
16.7.	Project Schedule						
16.8.	Plan Review/Scope of Work Compliance Statement						
16.9.	Permit Application Phase Deliverables Checklist						
S.O.W. Reference	**S.O.W. Specific Requirements**						

This checklist shall be completed by the Design Consultant and included as the cover sheet of this submission to document to the DPMC Project Manager the status of all the deliverables required by the project specific Scope of Work.

_____ _____

Consultant Signature Date

DPMC Project No.: S0651-00

Deliverables Checklist
Bidding and Contract Award Phase

A/E Name: _____

A/E Manual Reference	Submission Item	Required by S.O.W.		Previously Submitted		Enclosed	
		Yes	No	Yes	No	Yes	No
17.1.1.	Notice of Advertising						
17.1.2.	Bid Proposal Form						
17.1.3.	Bid Clearance Form						
17.1.4.	Drawings (6 Sets)						
17.1.5.	Specifications (6 Sets)						
17.1.6.	Construction Schedule						
17.3	Pre-Bid Conference/Mandatory Site Visit						
17.3.1.	Meeting Minutes						
17.4	Bulletins						
17.5	Post Bid Meeting						
17.6.	Contract Award "Letter of Recommendation"						
17.8.	Bid Protests - Hearings						
17.9.	Bidding and Contract Award Phase Deliverables Checklist						
S.O.W. Reference	**S.O.W. Specific Requirements**						

This checklist shall be completed by the Design Consultant and included as the cover sheet of this submission to document to the DPMC the status of all the deliverables required by the project specific Scope of Work.

_____ _____

Consultant Signature Date

DPMC Project No.: S0651-00

Deliverables Checklist
Construction Phase

A/E Name: _____

A/E Manual Reference	Submission Item	Required by S.O.W.		Previously Submitted		Enclosed	
		Yes	No	Yes	No	Yes	No
18.2.	Pre-Construction Meeting						
18.3.	Submittal Log						
18.4.	Construction Schedule						
18.5.	Project Progress Meetings						
18.7.	Contractor's Invoicing and Payment Process						
18.8.	Contractor Submittals						
18.10.	Testing						
18.11.	Shop Drawings (6 Sets)						
18.12.	As-Built & Record Set Drawings (6 Sets)						
18.13.	Change Orders						
18.14.	Construction Photographs						
18.15.	Field Observations						
18.17.	Construction Phase Deliverables Checklist						
S.O.W. Reference	**S.O.W. Specific Requirements**						

This checklist shall be completed by the Design Consultant and included as the cover sheet of this submission to document to the DPMC the status of all the deliverables required by the project specific Scope of Work.

_____ _____

Consultant Signature Date

DPMC Project No.: S0651-00

Deliverables Checklist
Project Close-Out Phase

A/E Name: _____

A/E Manual Reference	Submission Item	Required by S.O.W.		Previously Submitted		Enclosed	
		Yes	No	Yes	No	Yes	No
19.3.	Development of Punch List and Inspection Reports						
19.5.	Determination of Substantial Completion						
19.6.	Correction/Completion of Punch List						
19.7.	Submission of Close-Out Documentation						
19.7.1.	As-Built and Record Sets of Drawing (6 Sets)						
19.8.	Final Payment						
19.9.1.	Contractors Final Payment						
19.9.2.	A/E's Final Payment						
19.10.	Project Close-Out Phase Deliverables Checklist						
S.O.W. Reference	**S.O.W. Specific Requirements**						

This checklist shall be completed by the Design Consultant and included as the cover sheet of this submission to document to the DPMC the status of all the deliverables required by the project specific Scope of Work.

_____ _____

Consultant Signature Date

February 7, 1997
Rev.: January 29, 2002

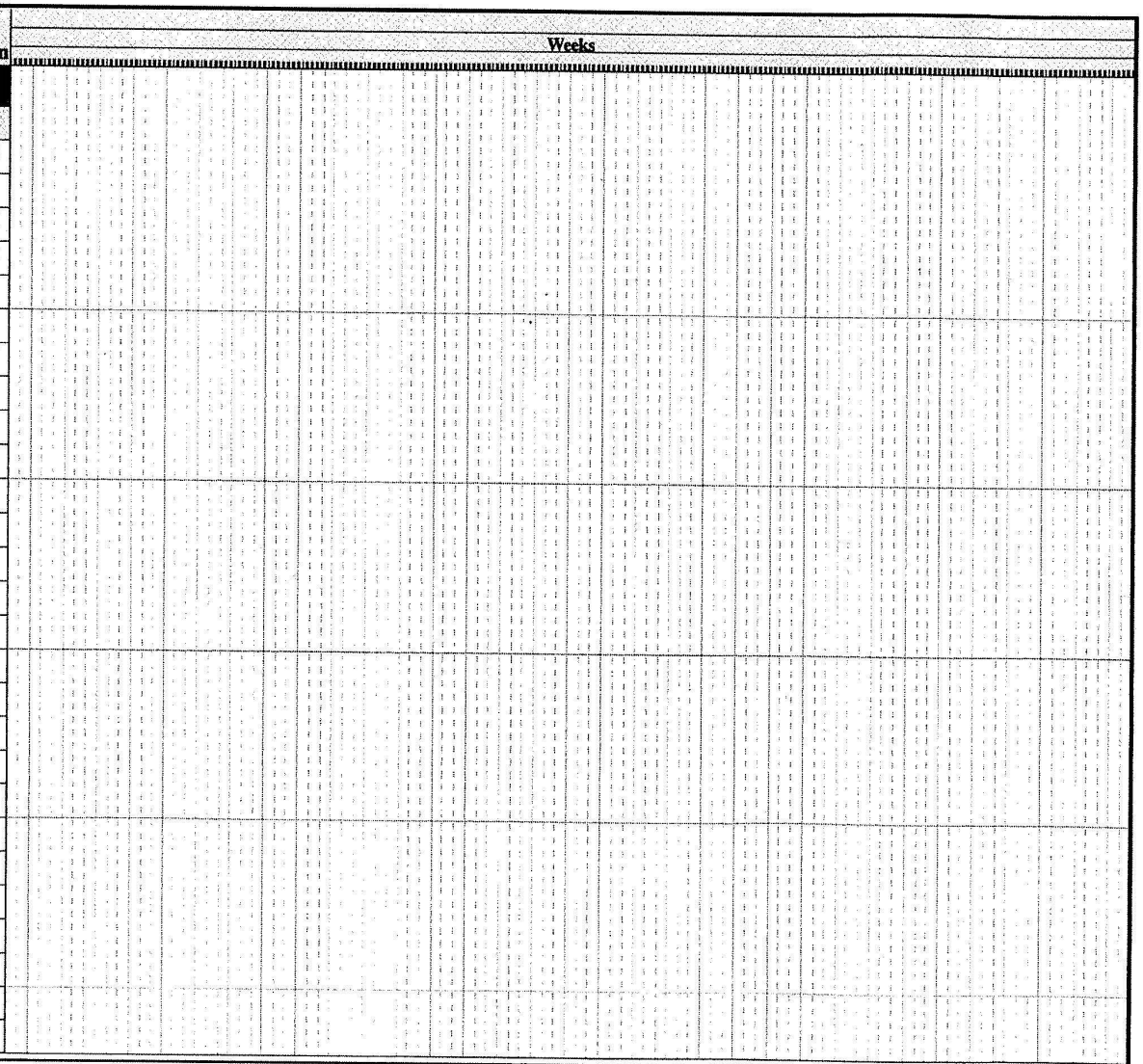
Responsible Group Code Table

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.

CODE	DESCRIPTION	REPORTS TO ASSOCIATE DIRECTOR OF:
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	Rspn
<PROJ>		
Design		
CV3001	Schedule/Conduct Predesign/Project Kick-Off Mtg.	CM
CV3020	Prepare Program Phase Submittal	AE
CV3021	Distribute Program Submittal for Review	CM
CV3027	Prepare & Submit Project Cost Analysis (DPMC-38)	CM
CV3022	Review & Approve Program Submittal	CA
CV3023	Review & Approve Program Submittal	PR
CV3024	Review & Approve Program Submittal	CM
CV3025	Consolidate & Return Program Submittal Comments	CM
CV3030	Prepare Schematic Phase Submittal	AE
CV3031	Distribute Schematic Submittal for Review	CM
CV3037	Prepare & Submit Project Cost Analysis (DPMC-38)	CM
CV3032	Review & Approve Schematic Submittal	CA
CV3033	Review & Approve Schematic Submittal	PR
CV3034	Review & Approve Schematic Submittal	CM
CV3035	Consolidate & Return Schematic Submittal Comment	CM
CV3040	Prepare Design Development Phase Submittal	AE
CV3041	Distribute D. D. Submittal for Review	CM
CV3047	Prepare & Submit Project Cost Analysis (DPMC-38)	CM
CV3042	Review & Approve Design Development Submittal	CA
CV3043	Review & Approve Design Development Submittal	PR
CV3044	Review & Approve Design Development Submittal	CM
CV3045	Consolidate & Return D.D. Submittal Comments	CM
CV3050	Prepare Final Design Phase Submittal	AE
CV3051	Distribute Final Design Submittal for Review	CM
CV3052	Review & Approve Final Design Submittal	CA
CV3053	Review & Approve Final Design Submittal	PR
CV3054	Review Final Design Submitl for Constructability	OCS



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

DBCA - TEST

Sheet 1 of 3

Bureau of Design & Construction Services

EXHIBIT 'A'

Activity ID	Description	Rspn	Weeks
CV3055	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	

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

DBCA - TEST

Sheet 2 of 3

Bureau of Design & Construction Services

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	

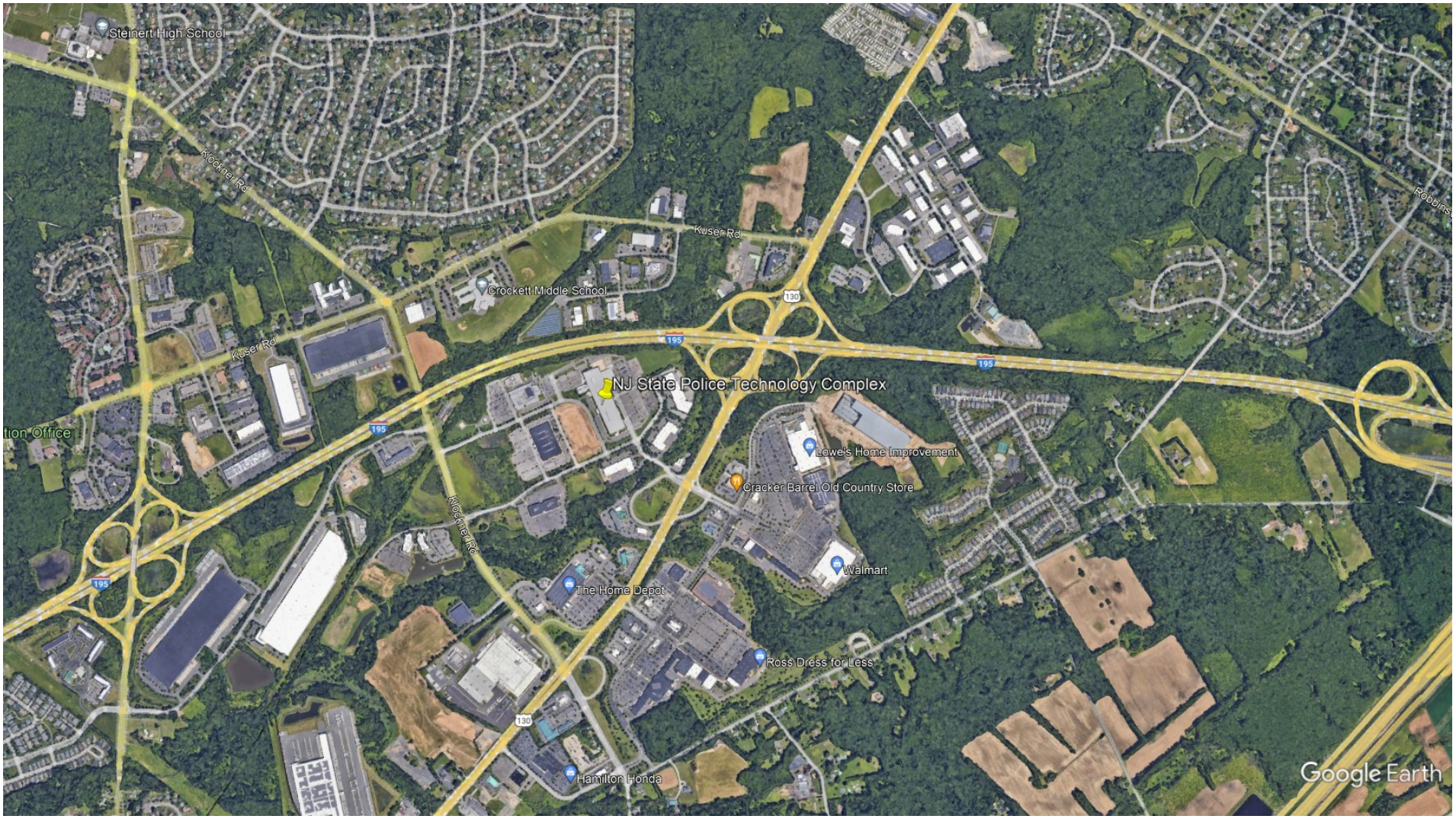
NOTE:
Refer to section "IV Project Schedule" of the Scope of Work for contract phase durations.

DBCA - TEST

Sheet 3 of 3

Bureau of Design & Construction Services

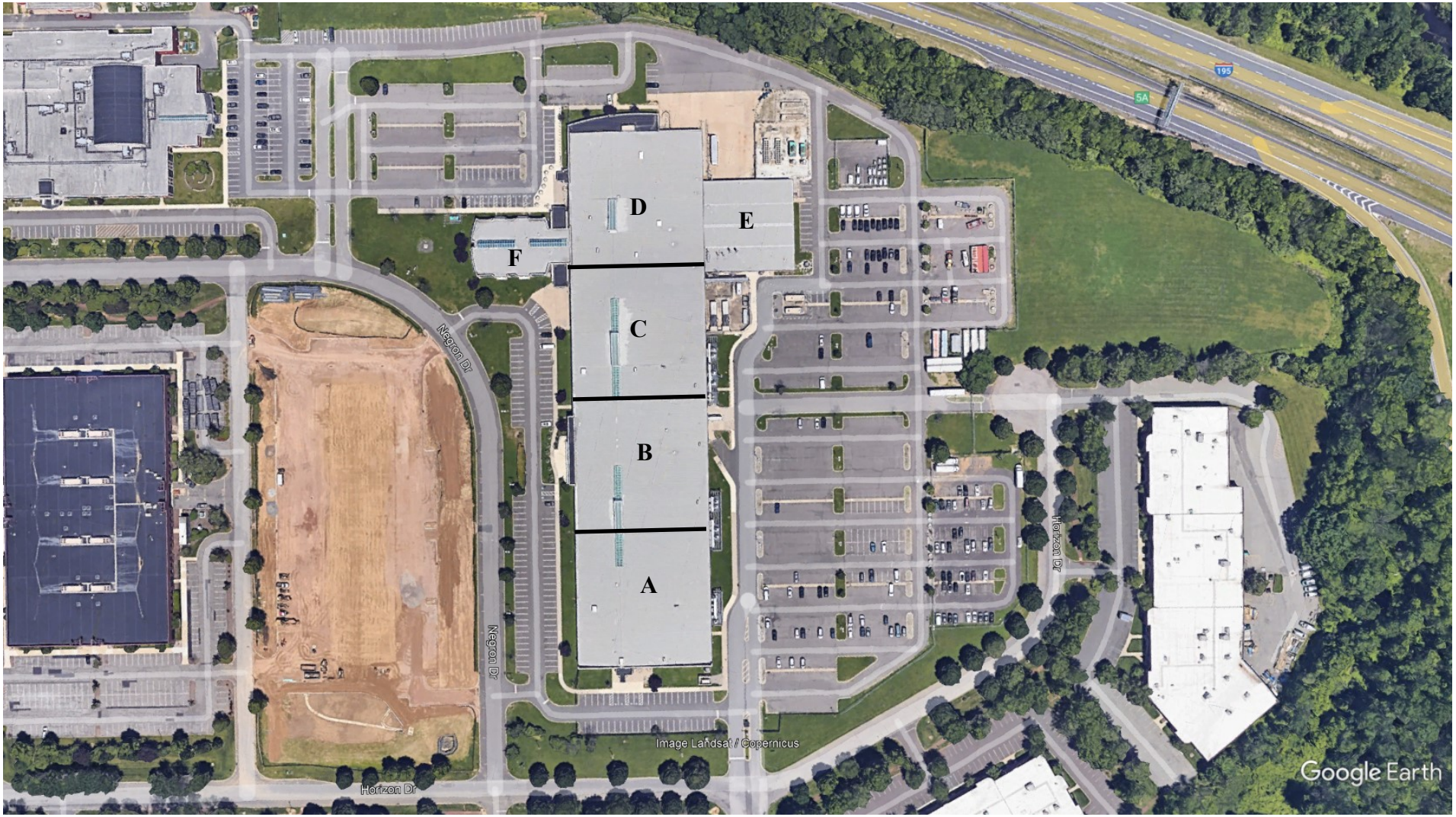
EXHIBIT 'A'



Project Site Location Map

NJ State Police Technology Complex

EXHIBIT ‘B’



Building Zones

NJ State Police Technology Complex

EXHIBIT ‘C’

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STRUCTURAL ANALYSIS OF PRE-ENGINEERED BUILDING ROOF

NJ STATE POLICE TECHNOLOGY COMPLEX
HAMILTON TOWNSHIP, MERCER COUNTY, NJ
May 10, 2010

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EXHIBIT 'D'

1.0 INTRODUCTION

On November 5, 2009 Thomas Rosenkilde and Vinay Meswani of Edwards & Kelcey met with representatives of the DPMC to receive information about the Forensic Laboratory building. The DPMC representatives included Richard Flodmand, Madeline Crane, John DiGiorgio, Michael O'Reilly, and Mark Kaminsky. We were informed that the building comprises approximately 195,000 square feet on one level; was designed and constructed between 1999 and 2001; and that the "shell" of the building consists of a pre-engineered structure manufactured by Varco Pruden. This type of structure is commonly used for manufacturing, storage and distribution facilities. The actual use of the building, however, is forensic laboratories. We were informed that the interior fit-out of the building, including mechanical equipment, is independent of the main building structure, with the exception of electrical conduit and some sprinkler piping hung from the roof framing. We furthermore understand that the standing-seam metal roof of this pre-engineered structure by design experiences deflections under certain conditions; this movement is so great it requires a special maintenance program; may be incompatible with skylights constructed over corridors; and may be the cause of water infiltration. Based on a review of existing building documentation provided by the DPMC, and visual observations of the roof, EK was engaged to analyze the roof structure to determine whether it was appropriately designed for allowable deflections, or if there are deficiencies in the design or fabrication that are causing excessive deflections. Our observations and conclusions follow.

EXHIBIT 'D'

2.0 INFORMATION BINDER DOCUMENTS REVIEW

The DPMC provided Edwards & Kelcey with a copy of its "Pre-Engineered Building Information Binder", dated July 2005. Based on the documents included in this binder, the following basic facts about the pre-engineered building can be established.

1. The project was initiated in 1999 as an office building to house the Division of Revenue. Site work began in February 2000, and the State purchased a pre-engineered building shell, but the project was terminated shortly thereafter. It was then decided to use the site and building shell to house a Multi-Purpose State Police Facility, including forensic laboratories.

2. The pre-engineered building shell was designed and manufactured by Varco Pruden Buildings Inc. of Evansville, WI. The erector of the pre-engineered building shell was Thomas Lindstrom & Co. of Cinnaminson, NJ. The General Contractor was the Claremont Construction Group of Far Hills, NJ. The Architect was L. Robert Kimball & Associates of West Chester, PA.

3. The building is T-shaped in plan, and is divided into six zones. The main spine is 200'-0" wide by 800'-0" long, running north to south. It has an asymmetrical pitched roof, and is divided into four zones labeled "A" through "D". The eastern arm of the T is labeled Area "E", has a pitched roof, and its dimensions are 135 'x 135'. The western arm of the T is labeled Area "F", it also has a pitched roof, and its dimensions are 84' x 148'. The height of the building around the perimeter (the low point of the roof) is approximately 18'-0".

4. Varco Pruden based its Structural design on the 1996 BOCA (Building Officials & Code Administrators) National Building Code; ASCE (American Society of Civil Engineers) 7-95 Minimum Design Loads for Buildings and Other Structures; and FMG (Factory Mutual Group) I-60 Rating for wind uplift requirements, based on 75 MPH Wind Speed.

5. The roof framing system is designed for 25.0 PSF Live Load, plus 3.63 PSF Roof Dead Load (the weight of the roof structure itself), plus 10.0 PSF Gravity Collateral Load. (Total Dead Load = 13.63 PSF). The framing was also designed to accommodate up to 73 PSF of additional snow drift load at the eaves and skylights, where snow drifts might occur.

    a. For reference, the 25.0 PSF flat snow load criterion would be equivalent to an accumulation of about 12 inches of wet, dense snow
    b. For reference, the 73 PSF drift snow load criterion would be equivalent to an accumulation of about 36 inches of wet, dense snow.

6. The roof pitch is ½" of rise per 12" of run (2.385 degrees), with rainfall intensity of 6.0 inches per hour. This is considered a "low slope" roof, which tends to retain snow and ice, rather than shed it.

7. The steel design was based on AISC 9th Edition, AISI 1986 W/1989 Addendum, AWS D1.1, ASTM, and MBNA Codes & Certifications.

8. Both the Architect and Varco Pruden have confirmed that the roof deflection design criteria are consistent with industry and code standards of L/240 for Dead plus Live Loads and L/360

EXHIBIT 'D'

for Live/Snow loads. Based on this criterion, the maximum allowable deflection for DL+LL Loads of the fifty foot-long long bar joists is 2 ½".

9. R-30 blanket insulation (11" thick) is installed under the roof, between the joists.

10. Both the Architect and Varco Pruden have submitted Roof Deflection Review reports noting that the roof framing was originally designed for typical office occupancy loads only, so independent structural support systems are required for any piping, conduit and equipment beyond that which may be found in a typical office occupancy.

11. According to recommendations made by Varco Pruden on 12 December 2003, "excessive" snow accumulation should be removed from the roof to avoid over-stressing the structure. We understand this to be defined as snow accumulation of 8" or greater.

12. Part of the parapet on west side of the building was removed in 2004 to reduce snow drift and to improve rain water drainage on this side of the building. The east side of the building was originally designed and constructed without parapets.

EXHIBIT 'D'

3.0 CONSTRUCTION DOCUMENTS REVIEW

The DPMC provided Edwards & Kelcey with copies of Varco Pruden's shop drawings, dated April 2000; L. Robert Kimball's Architectural drawings, dated September 1999, and Varco Pruden's calculations, dated March 2000. Based on these documents, the following additional facts about the pre-engineered building can be established.

1. The roof is a Standing Seam Roof (SSR) constructed of 24 gauge galvanized steel with 3" high ribs 24" on center, and a continuous deck span of 5'-0".

2. There is a single expansion joint, located at column line "9", at the approximate midpoint of the 800'-long building. This is between Areas B and C.

3. Main structural frames are spaced 50'-0' on center. The SSR deck is supported on 30" deep KS-Series bar joists manufactured by SMI. They are typically spaced 5' on center, and span 50'. There is "X" bridging every 10 feet along the joist span.

4. The bar joists are not standard "K" series joists whose properties are published in publicly available catalogs or manuals. The joists were custom-designed by SMI for this project. Although they are almost all 30" deep, the size and thickness of the angles varies from joist to joist, according to the loads for which the joist was designed.

5. Varco Pruden uses proprietary software to perform the Structural design of all its buildings. Therefore the calculations themselves cannot be evaluated, but the input data can be verified.

6. The most common type of joist found in area B is labeled "J11" in the plans. Curiously, this joist appears to have been omitted from the calculations provided to us.

7. Varco Pruden's structural design takes into account snow drift along the parapet wall and around the skylights. The joists spacing is reduced from 5' on center to 2'-6" on center in these areas, and the steel members used to fabricate the joists are larger.

8. Per Varco Pruden calculations, deflection limits are set as follows:

    a. Frames: H/400 deflection under 10 year Wind & L/240 deflection under Snow.
    b. Joists/Purlins: L/240 deflection under Snow.
    c. Girts: L/240 deflection under 50 year Wind.

9. Varco Pruden's drawings show heavy piping suspended along the east side of the building, parallel to the east façade. The design assumes a weight of 110 PLF (pounds per linear foot). No other mechanical loads or point loads are shown on the drawings.

10. The roof is insulated with R30 blanket insulation (11" thick) spanning between the joists.

11. Thermal block insulation is required at top of each joist, between the joist and the roof deck. This product reduces heat loss by breaking the thermal bridge where the SSR roof panels bear on the bar joists. It also compensates for the reduced efficiency of the blanket insulation where it is compressed between the joist and the roof deck.

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12. There are seven 50'-long skylights, located along the ridge of the roof. They are supported on steel framing that is independent of the roof framing. Three of skylights have tapered bulkheads approximately 10'-0' high, which encourages snow drift accumulation.

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4.0 VISUAL INSPECTION & OBSERVATION OF STRUCTURAL FRAMING, ROOF & SKYLIGHTS

Vinay Meswani of Edwards & Kelcey performed a site visit on 21 January 2010. Also in attendance were John DiGiorgio and Mark Kaminski of the DPMC, as well as the Chief Engineer for the building. The weather was cool and sunny, with no wind and no snow accumulation. Mr. Meswani and Tom Rosenkilde performed a second visit on 16 February 2010.

1. E&K observed the underside of the roof in the main corridors and at Mechanical rooms 100, 107, 127, 501, 700, 701 and 702. These mechanical rooms were selected because they have no hung ceilings, and the roof structure is readily visible. The underside of the roof in the forensic labs and other finished spaces was not made available for observation. A scissor lift was used to observe the undersides of the skylights.

2. We observed that skylights in the corridor area are independently supported, in accordance with the Construction Documents.

3. We observed that cooling towers and other large equipment was located on the ground next to the building, not up on the roof, due to the low load-bearing capacity of the roof.

4. We observed that most of the "primary" mechanical equipment and piping in the mechanical rooms is independently supported on structural posts, in accordance with Varco Pruden recommendations. This includes large air handlers and large diameter piping. However, we also observed a significant quantity of "secondary" mechanical and electrical equipment hung directly from the bar joist roof framing, including small air handlers or VAV units, ductwork, main sprinkler pipes about 6" in diameter, chilled water and hot water piping (whose diameter could not be verified due to insulation), cable trays, and conduit banks with up to six 2" diameter conduits ganged together.

5. Outside of the mechanical rooms, it appears that all piping, ducts, and conduit is supported from the bar joist. The finished ceilings, including light fixtures, are also supported from the bar joists.

*6. Insulation blankets are fastened to bar joists at top chord without straps, so they sag at the middle. Joints between blankets appear to open and untapped, reducing the effectiveness of the vapor barrier. The presence of specified thermal blocking at the top chord of the joist could not be visually verified.

*7. On the roof above the boiler room in Area E, there are six vent stacks tied back to the roof with guy wires. Flashing around vent pipes in this area is damaged and rusted.

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5.0 STRUCTURAL EVALUATION REPORT

Based on our review of the original construction documents of 1999 and 2000, the reports contained in the 2005 Information Binder, and the existing conditions we observed in January and February 2010, we would like to offer the following observations about the building's roof structure.

1. Collateral Load – per Varco Pruden's documents, the roof design included a collateral Dead Load of 10 PSF. This allows for the weight of the acoustic ceilings, fluorescent light fixtures, mechanical equipment, and insulation hung from the bar joists. A value of 10 PSF is typically used in Structural engineering for office buildings. However, in accordance with the building's laboratory use, we observed much more piping and conduit than one would expect to see in an office building. Within the mechanical rooms, most of this is independently supported on posts, correctly following Varco Pruden and Kimball's recommendations, but we observed a significant amount of ductwork, piping, conduit and cable trays suspended directly from the bar joists.

2. When hanging piping, conduit, etc. from open bar joists, the recommended practice is to attach hangers to the joist "panel points", where the bottom chord is connected to the web. However, we observed many instances where hangers were connected to un-reinforced sections of the bottom chord. This may be weakening the bar joists by inflicting unnecessary bending stresses on their bottom chords.

3. Under BOCA 1996, the building was designed to withstand a maximum Wind Speed of 75 MPH. However, under IBC 2000 it would be designed to withstand a maximum Wind Speed of 95 MPH.

4. Per Metal Building System Manual of November 2002, 50 years mean recurrence Climatological Data for Mercer County is as follows:

   a. Ground Snow Load : 30 PSF
   b. Basic Wind speed: 95MPH
   c. Rain Intensity: 8" per Hour for 5 minutes duration for 25 years recurrence.

   The wind speed and rain intensity exceed the allowances used by Varco Pruden for the design of the building.

5. At Area "E" there are six tall exhaust stacks anchored to roof deck with guy ropes. Wind forces acting on these stacks will cause the guy wires to pull up on the roof structure at their attachment points. The Varco Pruden drawings and calculations do not appear to take these point loads into account.

6. Under a 100 degree temperature differential, steel will expand or contract ¾" for every 100 feet. The roof is 800 feet long, which means it will expand or contract as much as 6 inches over the length of the building in the north-south direction. However, there is only a single expansion joint in the roof, at the center, allowing between 2 and 3 inches of movement. It would have been preferable to design the roof with two or three expansion joints. Thermal

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expansion of the roof in the short (200') east-west direction is not problematic, because the concealed clips holding down the roof panels allow for free movement in this direction. This assumes there is a single "point of fixity" for each panel, either at the ridge or eave, and it is free to move back and forth at the other end.

7. Insulation blankets are installed without any traverse straps, and the joints do not appear to be taped. The resulting sagging and open joints may allow excessive heat leakage thru roof. If heat is lost thru roof panels, it could cause snow to melt and re-freeze into ice, increasing roof loading and subsequent deflection. Additionally, the relatively low slope of the roof tends to hold snow, rather than shed it, resulting in greater loading and ice-damming conditions.

8. Per USA Snowfall patterns map, Mercer County receives 15 to 30 inches of snow fall per year. It is useful to note that the water content of snow can vary greatly, from as little as 0.10" of water to nearly 4" of water per 10" of snow. (For reference, one inch of water weighs 5.2 PSF.). Per Climatologically Data by County, Mercer County can have 6 to 8 inches of rain per hour, and rain-on-snow can create substantial amount of roof loads. Because the Varco Pruden calculations are based on their own proprietary software, it is difficult to verify that roof deck and bar joists are designed for unbalanced snow loads on the roof, due to wind force acting in either direction.

9. Per industry standards and codes, steel members are to be designed for a maximum defection of L/240 for DL+LL and L/360 for LL/SNOW. Varco Pruden's drawings state that this building meets these criteria. However, from the documents reviewed by EK, it is unclear if all loads were included (e.g. point loads from Mechanical equipment), and it is not possible to verify the actual calculations.

10. It appears that the joists were designed without a safety factor. This is not contrary to code, but it means they were designed to support a specific maximum load, under which they would deflect 2-½", with no redundancy or allowance for additional, unanticipated loads.

11. Varco Pruden recommends removing snow accumulation of 8" or more, to avoid over-stressing the roof. Although difficult and costly, this procedure is common for pre-engineered metal buildings, whose low initial cost is achieved in part by paring down the structure to the precise minimum required to support design loads within allowable deflection tolerances. Although conventionally framed steel structures typically have a higher initial cost, they are designed with redundancies and conservative safety factors that allow for heavy snow and other additional, unanticipated loads beyond the original design loads. Because they are "over-designed", allowable deflections are rarely observed in conventionally framed buildings.

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6.0 STRUCTURAL ANALYSIS OF EXISTING JOISTS

On E&K's second site visit, we measured member sizes and deflections of representative joists in the Mechanical Rooms, and also in the corridor parallel to column line 10. The corridor was selected because the building's maintenance engineers reported that deflections in this area were so great, they had caused ceiling tiles to fall out of the grid from time to time. It was snowing at the time of E&K's visit, but there was only light accumulation on the roof.

1. Where deflections could be measured in the Mechanical rooms, they averaged 1", well within the allowable tolerance. Deflections at other areas could not be measured, due to the finished ceilings. In general, the mechanical rooms are located at the perimeter of the building, where the roof is designed for snow drift, so the joists above these rooms are heavier and stiffer than those found in the center of the building.
2. Joist types J16A & J16C, found in Mechanical Room 100 and part of the adjacent corridor (see sketch SK-3), were found to match the sizes shown in Varco Pruden's drawings and calculations – 30" deep, with the chords fabricated from 2" x 2" x 3/16" angles.
3. Joist type J10D, found in the corridor at column line 10 (see sketch SK-4), was found to be smaller than the size shown in Varco Pruden's drawings and calculations. The chords are fabricated from 1 ½" x 1 ½" x 3/16" angles, instead of 1 ¾" x 1 ¾" x 3/16" angles, as shown in the drawings and calculation. (The depth is 30" as required.)

Structural Calculations

1. Using the design loads and field-measured member sizes, joist type J16A is good for DL+LL deflection of L/240, and also for LL-only deflection of L/360 (see calculation pages 13 to 16).
2. Using the member sizes specified by Varco Pruden, but allowing for additional point loads, joist type J16D will exceed deflection limit of L/240 for DL + LL. However, the joist is good for LL-only deflection of L/360 (see pages 9 to 12 of the attached calculations).
3. Using field-measured member sizes and additional point loads, joist type J10D will exceed the deflection of L/240 for DL +LL, and it will also exceed deflection of L/360 for LL only (see pages 5 to 8). If we assume that the field-measured joist was an exception, and other joists type J10D are typically fabricated with the correct member sizes specified by Varco Pruden, then the joist is good for deflection of L/240 for DL+LL without additional point loads, but if additional point loads are added, they will fail to meet L/240 criteria (see pages 1 to 4 of the attached calculations).

Conclusions

1. Joists in the mechanical rooms are within the allowable deflection limits, because the member sizes are larger than in the corridors, and the heaviest MEP loads are floor-supported.
2. Joists in the corridors may exceed allowable deflection limits, because some members appear to be under-sized, the suspended MEP equipment appears to exceed the 10 PSF collateral load allowance, and the design does not allow for any point loads. Per the

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attached calculations, if we assume point loads as shown on bottom chord of joist, in addition to the uniform collateral and snow loads, the deflection may be as much as L/200, or 3" over the 50' span (see pages 5 & 6 of the attached calculations).

3. The calculated deflection of L/200 in the corridor area exceeds allowable tolerances, but does not indicate that the building is in danger of structural failure. The excessive deflections may be causing excessive wear and tear on the roofing, and suspended piping and ceilings, because these are moving around more than they are designed for. We encourage the DPMC to have Varco Pruden examine the specific location where we observed under-sized joists, and provide their own analysis.
4. In theory, the deflections could be reduced by field welding additional angles or rods to the bar joists, to stiffen them. However, the logistics of performing this work in a finished, occupied building are prohibitive.
5. We strongly recommend that the DPMC continues to implement the specific, detailed snow removal program prepared by Varco Pruden. Pre-engineered metal building roofs have been known to collapse under excessive snow loads.

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7.0 ATTACHMENTS

1. Sketch SK-1 showing roof vent stack, skylights and expansion joints.
2. Sketch SK-2 showing building areas "A" to "F" including Mechanical, Electrical and Forensic Lab area.
3. Sketch SK-3 showing calculations for joist types J16A and C.
4. Sketch SK-4 showing calculation for joist type J10D.
5. Rain intensity, snow and wind load chart & table for Mercer County, NJ area, along with wind & snow data maps.(7 pages)
6. Photograph index
    a. Picture 1 West side building elevation
    b. Picture 2 Parapet removal
    c. Picture 3 & 4 Electrical conduits and unit hung from bar joists.
    d. Picture 5 R30 insulation blanket sagged with no straps.
    e. Picture 6 & 7 partially hung & independently supported hot & cold water lines.
    f. Picture 8 hot water expansion loop with valve supported from bar joists.
    g. Picture 9 to 12 sprinkler lines, HVAC ducts and water lines supported from bar joists with unistrut.
    h. Picture 13 & 14 Skylight support framing
    i. Picture 15 Dust Hood is hanged from joists.
    j. Picture 16 HVAC Unit with piping supported from floor.
    k. Picture 17 to 19 all water lines, sprinkler lines and duct work with acoustical ceiling are suspended from bar joist in the co corridor area.
    l. Picture 20 to 22 hot & cold water lines with electrical conduits hung from bar joist with unistrut and pipe roller supports.
    m. Picture 23 & 24 boiler area "E" Vent stacks with guy rope anchored to roof panels.
    n. Picture 25 skylights with tapered bulkhead covered with plastic due to water leakage.
    o. Picture 26 & 27 caulking leakage area around skylights.
    p. Picture 28 & 29 building expansion joint and leakage area caulked.
    q. Picture 30 & 31 partial removal of parapet wall on west side of the building.
7. Existing joists calculations pages 1 to 15

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EXHIBIT ‘E’

EXHIBIT ‘E’

EXHIBIT ‘E’