



pennsylvania
DEPARTMENT OF GENERAL SERVICES

BUREAU OF PRE-CONSTRUCTION

PROJECT PROCEDURE MANUAL
2017 EDITION

INSTRUCTIONS TO DESIGN PROFESSIONALS
UNDER AGREEMENT WITH THE
DEPARTMENT OF GENERAL SERVICES

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PREFACE

This Manual presents current procedural information relating to the sequencing and detail of the design professionals' activities under their contract with the Department of General Services (DGS).

Activities are explained sequentially through design, bidding and construction stages. The Bureau of Construction (BOC) Administrative Procedures describes, in greater detail, the Professionals' construction administration procedures and responsibilities.

It is essential that all individuals representing the design firm and its consultants become thoroughly acquainted with this Manual's contents, to best ensure that Design Submissions meet the detailed requirements for approval by DGS.

This Manual supersedes the previously issued editions and amendments/modifications to the Manual.

The Bureau of Pre-Construction Project Procedure Manual, with all subsequent amendments and modifications, is incorporated by reference into all standard Agreements for Professional Services made subsequent to the publication of the Manual.

This Manual will no longer be given out with the Professional Agreement or Orientation Packet. Please obtain these documents from the DGS Internet Website at www.dgs.pa.gov or in e-Builder.

Note: All documents, including Exhibits, training guides, etc., noted throughout the Manual as being included in e-Builder can be found in the "z - Standard Documentation & Training - PADGS" project.

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CHAPTER 1

PROJECT ADMINISTRATION

SECTION 100 - INTRODUCTION

100.1 MANUAL'S PURPOSE. The Bureau of Pre-Construction (BOPC) Project Procedure Manual ('the Manual' or 'PPM') provides Design Professionals ('the Professional') with a guideline of procedures and standards for the Design and Construction Stages of Department of General Services' (DGS) Public Works projects. The Manual's organization reflects the sequence in which services and submissions will normally occur.

100.2 MODIFICATIONS. As necessary, modifications to the Manual will be issued, with revised dates. The Professional should refer to the current version of this Manual found at the DGS website or in e-Builder.

100.3 EXCEPTIONS. It is not the purpose of the Manual to establish inflexible rules that hinder practical performance. If a specific situation appears to justify a deviation from the guidelines, it should be brought to the attention of the Design Manager. Prior written approval is to be obtained before making a deviation.

100.4 MODERNIZATION OF PUBLIC WORKS. Effective July 1, 2016, the Department of General Services, Public Works Deputate, initiated reorganization and reclassification of staff, as well as modernization of many internal processes. The former "Bureau of Engineering and Architecture (BEA)" will henceforth be the "Bureau of Pre-Construction (BOPC)". The former "Bureau of Professional Selections and Administrative Services (BPSAS)" ceased to exist, and its duties and functions assumed by the BOPC, under the Bidding Support and Contract Award Division. These changes are part of the Department's modernization program and will substantially change the manner in which the Department conducts business. Modernization changes job titles and responsibilities within the Bureau of Pre-Construction. The previous job title of "Project Coordinator" will no longer exist, but will instead be the newly-created title of "Design Manager". The title of "Portfolio Manager" will remain unchanged. The new roles and responsibilities associated with these titles/positions have been greatly expanded to better serve the project needs and the needs of our client Agencies.

- A. The Professional agrees to be an active and cooperative participant in this transition. The Professional will use e-Builder software for aspects of project management, communication and document transfer. The Professional will not bear any fees or licensing costs; all such costs are borne by the Commonwealth. The Professional agrees to participate in on-line training, tutorials, and other activities necessary to use the system software effectively.

SECTION 101 - REFERENCE AND STANDARD DOCUMENTS

101.1 MANUAL INCORPORATED INTO PROFESSIONAL AGREEMENTS. This Project Procedure Manual is incorporated into the Agreement for Professional Services and is complimentary to the Agreement and documents incorporated therein.

SECTION 102 - PUBLIC WORKS ORGANIZATION

102.1 PUBLIC WORKS. The DGS Deputy Secretary for Public Works administers capital improvement projects for most Commonwealth Agencies and some institutions of Higher Education ('Client Agencies'). Two (2) Bureaus operate under the Deputy Secretary: the Bureau of Pre-Construction (BOPC), and the Bureau of Construction (BOC). In addition to the two (2) Bureaus, Public Works also includes the Fiscal Office.

102.2 BUREAU OF PRE-CONSTRUCTION (BOPC). The Bureau of Pre-Construction is headed by a Director and administers the Professional services and the Project during the Design Stages.

- A. The BOPC is organized into three (3) Divisions by function: the Capital Planning Division, the Design Management Division, and the Bidding Support & Contract Award Division.
- B. The Design Management Division, headed by the Assistant Director, manages projects designed by Outside Professionals for the Client Agencies, with the emphasis on administration, review and

approval of the outside Professionals' work during the Design Stages. The Assistant Director supervises the Portfolio Managers.

- C. The Design/Construction projects of the many Client Agencies are divided into six (6) Portfolios, each of which includes all Capital Projects for a selected set of Client Agencies. Each Portfolio of Client Agency Projects is managed by a Portfolio Manager. The Portfolio Managers work together with the Design Managers, the Bidding Support and Contract Award Division, the Fiscal Office, and the Bureau of Construction from project initiation to completion. The Portfolio Managers supervise the Design Managers.
- D. The Design Manager is the Bureau's project administrator, and is the Professional's and the Client Agency's primary point of contact with the Department's Bureau of Pre-Construction, from initial assignment through project close-out. The Design Manager guides the Professional through DGS procedures, coordinates the Department's review efforts, and facilitates the successful completion of the project on schedule and within the Base Construction Amount.
- E. The BOPC establishes Public Works projects through the Capital Budget authorization process for capital projects, and through the receipt of Agency funded work requests, and administers the Professional Selection and design development process.
- F. The BOPC administers the construction contract Procurement Stage of all projects including, advertising, addenda, bid openings, and award.

102.3 BUREAU OF CONSTRUCTION (BOC). The Bureau of Construction (BOC) manages project activities from the award of construction contracts through completion. All contact with the Department during construction should be addressed to the Bureau of Construction. Upon request of the Bureau of Construction, the Bureau of Pre-Construction assists with administration of Professional services during the Construction Stage.

102.4 FISCAL OFFICE. The Fiscal Office receives and processes all invoices, maintains financial accounts and project funding data.

SECTION 103 - CORRESPONDENCE

103.1 FORMAT/ COPIES. All correspondence with the BOPC is to be addressed to the Design Manager by name, and shall be in Adobe Portable Document Format (PDF) and uploaded to the project files in e-Builder or in certain cases by email. Paper copies are not required. For special instances when hard copies are requested, the Bureau's mailing address is:

(Design Manager's Name)
 Bureau of Pre-Construction
 Department of General Services
 Arsenal Building
 1800 Herr Street
 Harrisburg, Pennsylvania 17103

103.2 CORRESPONDENCE FROM THIRD PARTIES. The Professional is to send the Design Manager a copy of all correspondence received, wherein project decisions, instructions or significant information is contained, if a copy has not been provided to the Department by the originator. If the Professional is soliciting a response from DGS on the third party's correspondence, a separate letter to the Department from the Professional addressing the matter is necessary.

103.3 IDENTIFICATION. It is imperative that all correspondence, e-mails, and other transmittals include/reference the DGS Project Number (including Phase and Part, when used) and the Project Title. The subject of the correspondence should also be referenced.

- A. Work Order requests shall be submitted via the work order process in e-Builder.
- B. Invoices shall be submitted via the invoice approval process in e-Builder.

103.4 E-MAILS. All normal correspondence regarding typical project information (i.e. project schedule, cost, contract terms, services, fees, scope of work, critical decisions and directions, etc.) must be in an e-Builder process, form or in the form of a formal letter, attached to the email. Each Project has an e-mail enabled folder. The e-mail is automatically saved in the Project by adding the Project's e-mail address to the e-mail cc list. E-mails must include the project number and be copied to the e-Builder project e-mail address.

SECTION 104 - MEETINGS, MINUTES AND REPORTS

104.1 MEETINGS. During the Design Stages of the Project, the Professional is required to attend as many meetings as necessary in order to produce a design that meets the Client Agency's requirements and is within the Base Construction Amount.

104.2 MINUTES. The Professional is to produce minutes of all project meetings with DGS, the Client Agency, or other bodies. The minutes are to be provided to the Design Manager and the Client Agency within one (1) week following the meeting by uploading to e-Builder.

104.3 RECORD OF CONVERSATIONS. Telephone conversations and other informal communications with DGS or other parties, wherein decisions, instructions or pertinent information significantly affecting the design schedule, or services are exchanged, are to be documented and provided to the Design Manager by uploading to e-Builder.

104.4 PROGRESS REPORTS. The Professional is to provide a Monthly Progress Report to the Design Manager each month, throughout the Design and Bidding Stages. Upload the report to e-Builder with each monthly invoice. Refer to Exhibit F1 (included in e-Builder) for a sample Monthly Progress Report. At a minimum, the Report must include the following: information:

- A. Percentage of design/document completion of each discipline (i.e. Civil, Architectural, Structural, HVAC, Plumbing, Electrical, etc.), for the particular Design Stage being invoiced.
- B. Significant actions taken during the month/billing period
- C. Anticipated circumstances that may affect schedule or cost

Note: The Monthly Progress Report must be submitted to the Design Manager, even if an invoice is not submitted for that month.

SECTION 105 - PAYMENTS AND FEES

Note: The DGS Modernization process and the use of e-Builder process management software may require revisions to the instructions to the Professional regarding submission of invoices to DGS.

105.1 INVOICE FORMATS. All invoices for Professional Services must be submitted through the e-Builder Invoice Approval Process. All of the actions described below for the various invoicing types occur within e-Builder.

Note: No invoicing input for any service can be entered into e-Builder without the prior submission of a separate Bureau of Diversity, Inclusion and Small Business Opportunities (BDISBO) invoice report occurring within the 30-day period prior to the date the Professional initiates a service invoice. This report is submitted through the e-Builder Small Diverse Business Utilization Report Process (SDBUR). If a SDBUR report has not been provided, an error message will occur and can be corrected by uploading a SDBUR report. Once the report is received, initiation of an invoice will be allowed within e-Builder.

105.2 INVOICES FOR BASIC SERVICES. All invoices for Basic Services must be entered through the e-Builder Invoice Approval Process.

- A. Design Submissions and Procurement Services: Follow the procedures outlined in the Invoice Approval (Professional) Training Guide included in e-Builder. Include a Monthly Progress Report as

backup to support the invoice amount requested for the services provided. Once the invoice is submitted, the Design Manager reviews the invoice and if approved, the invoice is submitted to the Fiscal Office for processing. If not approved, the Design Manager provides comments to the Professional for required revisions and a resubmission.

- B. Construction Services: Follow the procedures outlined in the Invoice Approval (Professional) Training Guide included in e-Builder. The Construction Contract Administration (CCA) services cannot be invoiced until the number of months for the construction period is confirmed. The number of months will then be entered and the Professional invoices based on the number of months of completed construction. Final Payment (FP) is a one-time payment when all services are completed (i.e. upon the Department's acceptance of the Professional's Certificate of Final Completion, approval of Record Drawings, evaluation completion of E&O Change Orders, final resolution of all claims and completion of all other Contract requirements). Once an invoice for CCA services is submitted, the BOC Project Manager (PM) or BOC Assistant Project Manager (APM) reviews the invoice and if approved, the invoice is submitted to the Fiscal Office for processing. If not approved, the BOC PM or APM provides comments to the Professional for required revisions and a resubmission. The invoice for FP is first reviewed by the BOC PM or APM and if accepted it is then reviewed by the Design Manager. If approved the invoice is forwarded to the Fiscal Office for processing. If not approved, comments are provided to the Professional from the PM, APM and/or Design Manager for revision and resubmission.

105.3 INVOICES FOR ADDITIONAL SERVICES. All invoices for Additional Services must be entered through the e-Builder Invoice Approval Process.

- A. Lump Sum Work Orders: Follow the procedures outlined in the Invoice Approval (Professional) Training Guide included in e-Builder. Invoicing cannot proceed in e-Builder without uploading a summary backup document describing the services provided that represent the invoice amount requested.
- B. Not To Exceed Work Orders: Follow the procedures outlined in the Invoice Approval (Professional) Training Guide included in e-Builder. Approved work order amounts for both lump sum and not to exceed work orders will be listed as a single amount in the e-Builder commitment lien for the work order. For not to exceed work order, the Professional must provide back-up for the requested invoice amount including but not limited to a Work Order Summary Page, a Work Order Breakdown of completed quantities for each unit price item, hourly rate, and listing of reimbursable expenses, followed by receipts/invoices to support all charges. Note that it is the Professional's responsibility to review/approve all invoices from its consultants, for content and correctness, before including them as invoice backup. The unit price items, hourly rates, staff titles or grades, negotiated multiplier, expense types and prices, etc. should match that approved in the Work Order. The Work Order Summary Page shall identify the approved work order total, the amount being requested for the invoicing period. Invoicing cannot proceed in e-Builder without uploading the summary backup document.
- C. Design and Procurement Stage Work Order Invoices: Once the invoice is submitted, the Design Manager reviews the invoice and if approved, the invoice is submitted to the Fiscal Office for processing. If not approved, the Design Manager provides comments to the Professional for required revisions and a resubmission.
- D. Construction Stage Work Order Invoices: Once the invoice is submitted, it is first reviewed by the BOC PM or APM and if accepted it is then reviewed by the Design Manager. If approved the invoice is forwarded to the Fiscal Office for processing. If not approved, comments are provided to the Professional from the PM, APM and/or Design Manager for revision and resubmission.

105.4 INVOICES FOR CHANGE ORDERS FEES. The services of the Professional arising from a Change Order authorized by the Department, which is not the result of the Professional's error or omission, shall be compensated at a rate in accordance with Professional Agreement, with no increase or reduction of fee for Credit Change Orders. Invoicing for fees on Change Orders shall be a one-time invoice at the end of construction when all Change Orders are processed and the fee amount due the Professional is known. The Professional must invoice for payment for fees using the e-Builder Invoice Approval Process. The invoice for Change Order fees is

first reviewed by the BOC PM or APM and if accepted it is then reviewed by the Design Manager. If approved the invoice is forwarded to the Fiscal Office for processing. If not approved the invoice process is returned to the Professional for revision.

105.5 FEES FOR ADDITIONAL SERVICES. All services beyond Basic Services must be authorized by Professional Work Order issued by DGS. The Professional shall submit a cost proposal for requested services when actual cost is the basis for compensation. No payment will be made in excess of the authorized amount unless there is a change in the scope of work. Payment will be made based on the actual costs or approved not to exceed amount, whichever is least. In certain cases, where appropriate, Additional Services may be compensated on a negotiated lump-sum basis.

- A. All requests for Additional Services must be approved by the Department and a Work Order must be executed prior to commencing performance of the Additional Services; unless specifically directed in writing by the Department to proceed and track costs. Refer to Exhibit A3, Instructions for Obtaining a Work Order for Additional Services, included in e-Builder.
- B. Reimbursable expenses are limited, but when permitted, they may not exceed the Commonwealth's standard allowable amounts/rates. No "per diems" are allowed.

105.6 INSURANCE. No payment for any services will be made without a current certificate of Professional Liability Insurance and a current certificate of General Liability Insurance on file with the Bureau of Pre-Construction. It is the Professional's responsibility to provide current certificates, as the previous certificates expire.

105.7 DISPUTES. Refer to Article 14 of the General Conditions to the Agreement for Professional Services for the procedure to address disputes/claims. The timing for review of disputes is limited to the following:

- A. Within thirty (30) days of Design Development approval;
- B. Within thirty (30) days after construction contract award; and
- C. Concurrent with the Bureau of Construction's 100% contractor's Field Dispute Request (FDR); and
- D. At any time deemed necessary by the Department.

SECTION 106 - RELEASE OF PROJECT INFORMATION

106.1 RELEASE. No information, finding, result or opinion, concerning the Project, is to be released to any Federal, State or Local, public or private entity, unless specifically authorized in writing by DGS. Inquiries are to be referred to the Design Manager. The DGS Office of Information, c/o the DGS Press Secretary, must review and approve all press releases and information given to the Public.

SECTION 107 – PROFESSIONALS' PERFORMANCE EVALUATIONS

107.1 STAGES EVALUATED. The Design Managers, and/or BOC Project Managers may render confidential evaluations of Professionals' and its Consultants' performance at the conclusion of the following stages:

- A. Schematic Design
- B. Design Development
- C. Construction Documents
- D. Overall Design Evaluation (Post-Bidding)
- E. Construction Contract Administration: at various % completion
- F. Construction Contract Administration: 100% Complete (Summary of Construction Stage)
- G. Construction Contract Administration: Post-Construction

107.2 USE OF RESULTS. Evaluations are strictly confidential and maintained only for the Department's use. Complete evaluation results will not be released to Professionals or its Consultants. The Professional will, however, be advised of a less than satisfactory performance evaluation and the reasons therefore.

SECTION 108 - SUSPENSION AND REACTIVATION

108.1 SUSPENSION AND REACTIVATION. The Project may be suspended by the Department at any time. If the Project is reactivated, it is the Professional's responsibility to review all changes in codes, regulations, conditions at the site, governing specifications, specified products and all other conditions that may affect the Project and update the design documents accordingly. Where codes and regulations have changed during a suspension or regulatory approvals have expired, the Professional must obtain updated or new approvals from governing or regulatory agencies. For information regarding possible additional compensation for reactivation, see General Conditions to the Agreement for Professional Services.

SECTION 109 - SELECTION OF CONSULTANTS

109.1 CONSULTANTS. Consultants listed in the Design Professional Selection Application for Specific Project, and on Exhibit A of the Agreement for Professional Services, must be used, unless otherwise justified by the Professional and approved in writing by the Department. The Professional must submit all Consultants not listed on Design Professional Selection Application for Specific Project, or on Exhibit A of the Agreement, to the Department for approval.

SECTION 110 – PROJECT PROGRAM STATEMENT, SCOPE AND BASE CONSTRUCTION AMOUNT

110.1 PROJECT PROGRAM STATEMENT AND SCOPE. The Project Program Statement including the Base Construction Amount is available to the Professional in e-Builder prior to fee negotiations. The Professional develops a more detailed Scope for the Project as part of the fee negotiations. The finalized Scope becomes an Attachment to the Agreement. The Agreement is sent to the Professional prior to the Orientation Conference.

110.2 CHANGES IN SCOPE. The sole interpreter of the Scope is the Department and no changes from or additions to the Scope are permitted without written direction.

110.3 UTILITY SERVICES. All utilities and services, such as water, sewer, power, telephone, communications, emergency power, etc. needed for proper function of the completed Project are included in the Scope, unless specifically excluded. The design of proper utility services is included as a Basic Service in the Agreement, whether it includes connections to existing systems, on or off the site, or providing new systems at the site.

110.4 BASE CONSTRUCTION AMOUNT. The Base Construction Amount is the amount of money available for the construction of the Project. Funds for design fees and contingencies, such as Work Orders, Direct Payments to Utility Companies, and Change Orders are not taken from the Base Construction Amount. It is the Professional's responsibility to design the Project within the Base Construction Amount. For the Schematic Design Submission through the Contract Document Submission, the Professional is to present three (3) base bids. All base bids should be within the Base Construction Amount. Base Bid 1 should be approximately 90% of the Base Construction Amount but not more than 95% of the Base Construction Amount. Only upon approval of the Director may Base Bid 3 exceed the Base Construction Amount. The Base Construction Amount can be changed only by DGS and only with an Amendment to the Agreement. Utility service installation and construction necessary to provide an operational facility are to be included within the Base Construction Amount.

110.5 ESCALATION. The Base Construction Amount includes all monies available for construction. Escalation must be included in each Probable Construction Cost Summary, projected to the anticipated mid-point of construction, on all cost estimates. Monthly escalation percentages are determined by the Professional based upon its judgment and available information.

110.6 COST MONITORING. It is essential that the Professional use a cost monitoring system, during the Design Stages, which will continually determine if the Project is within the Base Construction Amount. The Professional is to immediately stop all work and inform the Design Manager when, in the Professional's opinion, the estimated construction cost exceeds the percentage of the Base Construction Amount, as allowed by the Agreement. Failure to notify the Design Manager may result in the Professional being required to redesign the Project, at its own expense. The Professional may not proceed after notification, without instructions from DGS.

SECTION 111 - PROGRAM AND PROJECT DEVELOPMENT

111.1 THE PROGRAM. Relevant program information may be provided to the Professional, when available. The information's sophistication may vary from a simple description of the purpose and function of the proposed facility to a detailed description of spaces, relationships and sizes. The Professional shall meet and work with the Client Agency to determine program requirements and design criteria, and shall refine and complete the detailed Program.

111.2 PRE-PLANNING SERVICES. Pre-planning services such as comprehensive comparative site evaluations, planning surveys, or financial feasibility studies are not considered Basic Services, unless otherwise provided in the Agreement. Furnishing previously prepared pre-planning or feasibility studies to the Professional does not relieve the Professional from exercising professional judgment in all matters of design. Any and all items or issues discovered in such studies that are not consistent with the Professional's judgment shall be brought to the attention of the Design Manager for adjudication.

SECTION 112 - PROJECT PHASING

112.1 DEFINITION. Phasing of the Project occurs when portions of the Project are bid at separate times. Phasing may include separate design schedules, as well as separate construction schedules, for the different Phases. Phasing will be at the discretion of the Department. The Base Construction Amount will not be altered by Phasing. The total construction award, including all Phases, may not exceed the Base Construction Amount.

112.2 PROJECT NUMBERING. The initial project is typically numbered as Phase 1, such as project number DGS 412-45 Phase 1. Subsequent phases are numbered sequentially.

112.3 PROFESSIONAL FEE. At fee negotiation or during any of the Design Stages, the Department, at its sole discretion, shall determine whether or not the Project and the related contracts will be designed, bid and/or constructed in one or more Phases. The Professional's compensation for each Phase shall be negotiated with the Department, but is not to exceed the original negotiated fee plus one percent (1%) of the Base Construction Amount.

SECTION 113 - APPROVALS AND COMPLIANCES

113.1 DGS APPROVAL. The Department may choose to Approve / Conditionally Accept / or Reject a Design Submission. The Professional must receive the Department's Conditional Acceptance or Approval of each separate Design Stage prior to proceeding to the next stage. No compensation for wasted design or changes will be paid for work performed on subsequent Design Stages prior to receipt of approval of preceding stages.

113.2 CLIENT AGENCY APPROVAL. All Design Stage Submissions (Programming, Schematic Design, Design Development, Interim Construction Documents, and Construction Documents) must be approved by the Client Agency at, or following, the Review Conference. During all Design Stages, the design/documentation should be closely coordinated with the Client Agency/Institution, so that the Client Agency/Institution is in general agreement with the Program, Design Concept, and Scope of Work when the Submission is made to DGS. The Design Submission should not include any major design decisions that do not already have the informal approval of the Client Agency. The Professional is to secure the Client Agency's formal approval of each Design Stage within the e-Builder Design Review Process.

113.3 REGULATORY AGENCIES. The Professional must obtain the design approval of all Local, State, Federal and other regulatory agencies having jurisdiction over the Work of the Project. Permits and approvals required at various stages are covered in more detail in subsequent chapters of this Manual. The Professional will be reimbursed the direct cost of permits, filing fees or similar approvals, obtained during the Design Stages. The Professional shall obtain the necessary Building Permit from the Department of Labor and Industry under the Pennsylvania Uniform Construction Code (UCC). Commonwealth projects are exempted from local building permit approval. Where other permit applications are part of the codes approval process, the Professional shall make application and obtain all required permits.

SECTION 114 - DEFINITIONS

114.1 PURPOSE. In order to eliminate ambiguity, and to avoid confusion and dispute, the Professional shall use the following terms with the precise meanings as herein described. Particular care shall be exercised to use these words/definitions in a consistent manner, throughout the Drawings and Specifications. Refer to the General Conditions to the Agreement for Professional Services for more definitions.

- A. 'Assistant Project Manager' or 'APM': Bureau of Construction (BOC) staff member assigned to assist the PM with managing and overseeing the Project from the construction contracts award to final inspection and Project closeout.
- B. 'Base Construction' or 'Base Construction Amount': The amount of money available for the construction of the Project.
- C. 'BOC': The Bureau of Construction.
- D. 'BOPC': The Bureau of Pre-Construction.
- E. 'Client Agency': The Department (other than DGS), Board, Commission, State Agency, State University, State-Aided College or University for whom the project is being designed and constructed.
- F. 'Department': The Department of General Services of the Commonwealth of Pennsylvania, or any authorized representative, and is referred to throughout the Contract Documents as if singular in number.
- G. 'Design Manager' or 'DM': The Bureau of Pre-Construction (BOPC) staff member assigned to manage and oversee the Project progress from negotiation of the Agreement for Professional Services through award of construction contract(s).
- H. 'Furnish': To supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- I. 'Install': Operations at the Project site, including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.
- J. 'Institution': The particular facility at which the work of the Project is located.
- K. 'Portfolio Manager': The Bureau of Pre-Construction (BOPC) staff member who is the liaison with one or more Client Agencies and who oversees the progress of the Capital Projects and the DMs assigned to those projects for those Client Agencies.
- L. 'Professional': The Architectural or Engineering firm retained by the Department to design and document the work of the Project, or the Professional's authorized representative.
- M. 'Project Manager' or 'PM': Bureau of Construction (BOC) staff member assigned to manage and oversee the Project from the construction contracts award to final inspection and Project closeout.
- N. 'Project Manual': Document which includes a Cover Page, Table of Contents, List of Drawings, Division 01 – General Requirements, and technical specifications of all contracts which describe the type, quality and use of materials, equipment, processes and systems to be incorporated in the work.
- O. 'Provide': To furnish and install, complete and ready for the intended use.
- P. 'Quality Assurance': Testing and inspection services provided by the Professional as Additional Services, and performed by an independent Consultant, retained by the Professional and acting on behalf of the Department, to ensure a quality project.

- Q. 'Quality Control': Primary testing services required by the specifications, and performed by an independent agent provided by the Contractor.

SECTION 115 - CONTRACT INTERPRETATION

115.1 PURPOSE. The Professional should understand how the Contract Documents are to be interpreted. The following is a summary of the rules governing interpretation of the Contract Documents from the General Conditions to the Construction Contract:

- A. Specifications shall govern over Drawings.
- B. Specifications and Drawings shall govern over the General Conditions.
- C. Special Conditions shall govern over all Specifications, General Conditions and Drawings.
- D. Addenda shall govern over all other Contract Documents.

The Professional must be conscious of the requirements of the General Conditions to the Construction Contract, and Special Conditions, and include no language in its Specifications that will change, contradict, or conflict with the intent of the Department's standard documents.

SECTION 116 - CONTRACTING METHODS

116.1 METHODS. The Department may employ any of several different methods for design and construction of Commonwealth projects. Following is a brief description of each method, stating various aspects particular to each. The Professional's primary role is still preparing contract documents to support whichever method is selected by the Department. The Design Manager will provide additional guidance to the Professional, as necessary.

116.2 CONVENTIONAL PROJECTS. Conventional building projects can be of two (2) types, as determined by the Department, and as listed below.

- A. Low Bid Projects: Upon completion of the design, Low Bid Projects are publicly advertised for bids, and sealed bids are received, with the contracts being awarded to the lowest responsible bidders.
- B. Best Value Projects: Upon completion of the design, Best Value Projects are publicly advertised for proposals, and sealed proposals are solicited/received by the Request for Proposal (RFP) process, with the proposals reviewed and scored in various criteria/categories by a Committee, with the contracts being awarded to the highest scoring proposers. For this process, the Professional provides the Bidding Documents to the Department for distribution, along with the RFP document (provided by the Department) to proposers, and is required to attend the Review Committee meetings.

116.3 EMERGENCY PROJECTS. When necessary, Emergency Projects may be designated, as determined by the Director of the Bureau of Pre-Construction, whereby bids/proposals are solicited from a selected list of at least three (3) invited bidders. Emergency Projects may be for design, construction, or other services, and may be one of two types, as follows.

- A. Emergency Low Bid Projects
- B. Emergency Competitive Proposal Projects

116.4 DESIGN/BUILD PROJECTS. From time to time DGS will solicit RFP's for Design/Build projects, whereby a Design/Build firm is selected by the RFP process to provide "turn-key" type services, including both project design and project construction.

116.5 EXHIBIT DESIGN AND FABRICATION PROJECTS. Projects whereby proposals are solicited and contracts are awarded by the RFP process, and which may include only Exhibit Design, or only Exhibit Fabrication/Installation, or both Exhibit Design and Fabrication/Installation.

116.6 FEASIBILITY STUDY SERVICES. Projects whereby proposals are solicited and contracts are awarded by the RFP process, for special studies intended to determine project feasibility, and which may include conceptual design and cost estimating.

116.7 OTHER METHODS. When authorized, other methods may be used to design, build, and contract DGS projects.

CHAPTER 2

GENERAL INFORMATION

SECTION 200 - GENERAL

200.1 SITE VISIT. The Initial Site Visit will provide the Professional the opportunity to review with the Client Agency's and Institution's representatives the Project Description, the Institution's purpose, the project feasibility, site location, special design or construction considerations, and any available program information.

200.2 SITE SELECTION. The Professional is to recommend a site when the Client Agency has a choice of sites available at the Institution. The Professional's recommendation shall consider suitability of the site for the program, availability of services, costs, and relationship to existing and future facilities, environmental considerations, and other benefits and restrictions, based on information readily available. The BOPC must be kept informed of this process and must approve the site selection.

SECTION 201 - SURVEY OF EXISTING CONDITIONS

201.1 SITE VERIFICATION. The Professional is to investigate existing site conditions visually and by measurement, as well as by examining available records and drawings, to determine the location and nature of utility lines and all other man-made conditions, as well as natural conditions, that may influence the Project. Record Drawings and any existing survey cannot be relied upon to adequately disclose the pertinent information. (See Section 203 and Section 204 for information regarding Land Survey, Subsurface, and Related Site Investigations).

201.2 EXISTING BUILDING CONDITIONS VERIFICATION. The Professional is to completely survey the existing structures of alteration, addition and renovation projects to determine all existing conditions affecting the new work. The survey shall include all HVAC, Plumbing, Electrical, Elevator services and all other conditions necessary for a comprehensive design and complete construction documents. Record Drawings, if available, are only intended as a guide. DGS assumes no responsibility for their accuracy. Surveys of existing conditions include reasonable cutting of exploratory holes and other investigations to determine the location of existing elements as necessary for coordinating the design. The Client Agency shall determine if the exploratory hole location is acceptable, considering the facility's operation, and assist with relocation, if necessary. The Client Agency is responsible for actual cutting and patching of the holes. All existing conditions affecting the work shall be documented on the Contract Drawings.

201.3 EXISTING DRAWINGS. The Department has, in archival storage, Record Drawings for a majority of the projects constructed by the Department and the Former General State Authority (GSA). Professionals are advised to review existing documents available at the Client Agency and Institution and determine their need for Record Drawings. Record Drawings may be available for viewing at the Department. To review Record Drawings at the Department, contact the Design Manager.

201.4 MEASURED DRAWINGS. Preparation of dimensioned measured drawings of the entire building may be authorized as an Additional Service, at the discretion of Department, when existing drawings are not available, and:

- A. when dimensioned plans of the entire building are required, and when the scope of work is limited to only a portion of the building, or
- B. when existing conditions survey and drawings are insufficient or record drawings are grossly inadequate to proceed with the work required for the Project.

201.5 FLOOD PLAIN INVESTIGATION. Prior to starting design the Professional should determine if the site is within or near the 100-year flood plain elevation. Commonwealth buildings must comply with local ordinances whether they are FEMA dictated minimums or more stringent local requirements. Under no circumstances should the lowest finish floor elevation be below the 100-year flood plain elevation. The Project, including site improvements, must be designed with floodwater elevations considered. Facilities placed in flood plain areas will usually require a permit from the Department of Environmental Protection (DEP). Design approvals of all

regulating authorities and executed DEP encroachment permits are to be submitted with the Construction Documents Submission.

- A. If there are flood issues, it is the responsibility of the Professional to resolve them prior to preparing design drawings. Any redesign required because of failure to comply with requirements of controlling regulators will not be considered wasted design.

SECTION 202 - CODES AND PERMITS

202.1 PROFESSIONAL'S RESPONSIBILITY. The Professional shall design the Project in compliance with all applicable Federal, State and Local Codes, Ordinances, Laws, and Regulations having jurisdiction.

202.2 VARIANCES. Variances to codes and ordinances are to be avoided. When a variance seems to be a desirable option it is to be reviewed with the Design Manager. In no case is a variance application to be made without prior approval of DGS.

202.3 BUILDING CODES. The project design and construction must conform to the latest edition of the Pennsylvania Uniform Construction Code (UCC), as adopted and enforced by the Department of Labor and Industry. Refer to Section 905.12 for a listing of Basic Codes/Regulations. It is the Professional's responsibility to verify the version of each Code followed by the Permitting Agencies involved with the Project (such as the Department of Labor and Industry and the Department of Health).

- A. The UCC also adopts various standards and codes including International Building Code (IBC) for use throughout the Commonwealth of Pennsylvania. The Department of Labor and Industry will perform code enforcement and enforce the UCC. State-owned buildings are exempted from local (Municipal, Township) review of projects for building permit.
 - 1. PA Uniform Construction Code (UCC) is administered by the PA Department of Labor and Industry.
 - 2. All Commonwealth projects are exempted from fees for plan review and building permit application.
- B. Other Building Codes and Standards (Local, State and Federal) not listed may also apply.

202.4 ZONING. DGS is required to comply with local land use, setback, height and other local zoning restrictions. Basic Services includes making application, attendance at zoning hearing meetings, and obtaining zoning approval and variances prior to Design Development Submission. The cost of special displays and/or presentations may be considered Additional Services.

202.5 SUBDIVISION AND LAND DEVELOPMENT APPROVAL. The Department will comply with local subdivision and land development ordinances. The completion of application forms, the design of project construction elements necessary to comply with the regulatory requirements, and obtaining the required approvals/permits are compensated as part of Basic Services. All drawings, compilations of computations, special studies, narratives, attendance at public hearings (including travel expenses), required by the regulatory agency are considered part of Basic Services.

- A. The Professional will be reimbursed the actual fees/amounts paid to regulatory agencies for applications, reviews, approvals, permits, and recordation.
- B. Include the Department's standard signature block on the drawings. Refer to Exhibit E6, Subdivision/Land Development Plan Signature Block, included in e-Builder.

202.6 PERMITS. The Professional is to obtain all other design approval permits, such as those issued by the Department of Health (DOH), the Department of Environmental Protection (DEP), the Pennsylvania Historical and Museum Commission (PHMC), PennDOT, etc. and permission to connect to utility systems.

202.7 APPROVAL TIMING. The requirement for obtaining preliminary and final regulatory approvals at each of the Design Stages is addressed in Chapters 4, 5, 6 and 7. Any other necessary approvals not specifically mentioned are to be obtained prior to the Construction Documents Submission.

SECTION 203 - LAND SURVEY

203.1 INITIAL INFORMATION. Collect all available topographic and other site information available from the Client Agency and DGS at the time of the initial site visit or shortly thereafter and review, analyze and determine completeness of Project Information.

203.2 OBTAINING A LAND SURVEY. Immediately after the Orientation Meeting, if applicable, the Professional should submit a draft RFP for a Property/Topographic survey to the Design Manager. The survey is considered an Additional Service by the Professional. Chapter 13 contains instructions for obtaining a Property/Topographic survey. Refer to Exhibit G3, Instructions for Land (Boundary and/or Topographic) Survey and Sample RFP, included in e-Builder. The Professional should obtain confirmation from public records so that all existing easements are shown on the land survey.

SECTION 204 - SUBSURFACE AND RELATED SITE INVESTIGATION

204.1 INTENT. The Professional, with a Civil/Structural Engineer, is to obtain data that will yield sufficient information for an accurate evaluation of the existing subsurface and related conditions for the following purposes:

- A. Analysis, design and construction of foundation and substructure.
- B. Analysis, design and construction of site work such as embankment, slopes, retaining structures, site and subsurface drainage, roads and pavements.
- C. Soil Erosion and Sedimentation Control.
- D. Analysis, design, and construction of stormwater management control measures and best management practices.
- E. Analysis and cost estimation of rock and soil excavation and fill.
- F. Wetlands and other land use evaluation.
- G. Archaeological studies.

204.2 OBTAINING SUBSURFACE AND RELATED INFORMATION. The Professional, with a Civil/Structural Engineer, is to gather available information from any previous studies or reports and by observing the site. Chapter 13 contains necessary information for conducting subsurface and related site investigation, and for the Professional's compensation for these services.

204.3 SUBSURFACE FUEL TANK INVESTIGATIONS. There are specific regulations regarding existing and new fuel storage systems. Unforeseen fuel systems, whether discovered during design or construction, shall be addressed by the Professional in the most appropriate manner so as not to impede the Project. The Professional shall use due diligence to determine the presence of or lack of underground tank systems.

204.4 SUBSURFACE UTILITY INVESTIGATION. When it is necessary to locate unobservable utility lines, tanks or other objects, due to complexity or special circumstances of the project, the Professional may be authorized, as an Additional Service, to perform a Subsurface Utility Investigation (sometimes referred to as Subsurface Utility Engineering), to obtain the necessary information through the use of geophysical prospecting techniques. See Chapter 13 for details.

204.5 SOILS ENVIRONMENTAL ASSESSMENT. When newly purchased property is the site of the Project, the acquisition process includes investigation into the existence of hazardous chemicals in the soil due to previous occupancy. The Design Manager will inquire and determine that this has been done. When the Project site is on land owned by the Commonwealth, the Client Agency shall alert the Department and the Professional of any previous activity, which could have created soil contamination problems. Where the likelihood of contamination is real, the Department and the Professional shall jointly determine if a soils

environmental assessment is appropriate as an Additional Service if not negotiated as a Basic Service in the Agreement. Installing improvements on top of contaminated soil is to be avoided.

SECTION 205 - DESIGN RESTRICTIONS

205.1 GENERAL. Specifications for DGS projects are “or equal” specifications, and products available from a single manufacturer, or a limited number of manufacturers, are not to be used in project designs. DGS requires at least three (3) manufacturers of an available product to be specified, but bidders may use equal products/manufacturers as approved by the Professional, as per the General Conditions to the Construction Contract.

- A. The Professional must use care in writing product specifications not to include unnecessary descriptions of product parts, functions, operations, or any non-critical requirements that may unnecessarily restrict bidders.
- B. The Professional must use care not to specify any requirements that may unnecessarily restrict bidders; such as geographic district, training by either union or non-union sources, or products that are union-certified. Requirement for training by the product manufacturer is acceptable. If uncertain, discuss with the Design Manager.

205.2 PROPRIETARY PRODUCTS/SYSTEMS. When the Client Agency wants to restrict acceptable products/manufacturers to one or more specific products/manufacturers for any product or system, the following procedure for requesting proprietary approval must be followed:

- A. Use the Proprietary Products Process in e-Builder and follow the Training Guides included in e-Builder. The Client Agency starts the process by adding the description of the product, the reason for requesting it to be proprietary and includes supporting documentation as may be required. The information must identify why and how the said specific manufacturer’s product or system meets the Client Agency’s/Institution’s requirements, and that use of other manufacturers’ product or system would not work for this Project or situation. The information must also explain how the product or system best serves the Commonwealth, and give compelling reasons why only this particular proprietary product or system must be used.
- B. It must be confirmed that the manufacturer of the proprietary product or system does not limit the installation of the product or system to only one Contractor within the Project area.
- C. Once the Client Agency submits the information, the e-Builder process moves to the Professional. The Professional adds information to the process as described in Exhibit F4, Proprietary Request Procedures, included in e-Builder.
- D. Once the Professional adds the required information, the process moves to the Department for review and approval or disapproval.

205.3 RESTRICTED PRODUCTS. DGS does not have a blanket “Buy America” policy. Foreign steel restrictions are covered in Paragraph 205.4. Refer to the Instructions to Bidders for specific prohibitions.

205.4 STEEL PRODUCTS. Pursuant to the Steel Products Procurement Act, steel products including approved proprietary products must be composed of steel manufactured in the U.S. Products containing foreign steel are permitted only if 75% of the cost of the product is composed of articles or materials mined, produced or manufactured in the U.S. DGS may grant an exception to the prohibition when it determines that the product is not manufactured of U.S. steel in sufficient quantity for the Project. The Professional is not to knowingly specify a prohibited product. See Instructions to Bidders for construction contract language.

205.5 ARCHITECTURAL CONCRETE. Cast-in-place concrete as an architectural finish, in all but utilitarian spaces, is prohibited. The use of bare concrete, colored concrete, burnished concrete, and/or polished concrete as a floor finish, is strictly prohibited, in all but utilitarian spaces; no exceptions will be granted. The prohibition does not apply to pre-cast concrete; however, its use must be approved by the Department.

205.6 ENERGY SOURCE FOR SPACE HEATING. Heating systems or heating units installed in a facility owned by the Commonwealth shall be fueled by coal, consistent with Act 1990-28. Exceptions permitted under the Act appear in Chapter 13, Section 1311 of this Manual.

205.7 DEVIATION FROM CONSTRUCTION CONTRACT GENERAL CONDITIONS. The Department uses its standard General Conditions to the Construction Contract for all projects. The Department also uses Special Conditions, which are supplementary conditions to the General Conditions. The Special Conditions are revised from time to time to cover changes required in the General Conditions items on particular types of projects. The Professional may not deviate from the standard practices and procedures established in the General Conditions and Special Conditions without specific approval from the Design Manager.

205.8 STANDARDS OF QUALITY AND SUBSTITUTION OF MATERIALS. For requirements regarding approved equals or substitutions and use of trade names, refer to the General Conditions to the Construction Contract, and to Chapter 9 of this Manual.

SECTION 206 - MULTIPLE PRIME CONTRACTS

206.1 REQUIREMENT. Separate Prime Contracts for General Construction, HVAC Construction, Plumbing Construction and Electrical Construction are required by Pennsylvania Law for all DGS Capital Projects.

206.2 MISCELLANEOUS CONTRACTS. Hazmat abatement, sprinklers, heavy construction or other specialties may be separate Prime Contracts at the discretion of DGS.

206.3 DIVISION OF WORK. Division of work among the Prime Contracts shall be in accordance with the following list. Work not listed is to be included in the most appropriate contract after checking it with the Design Manager.

A. GENERAL CONSTRUCTION CONTRACT (.1):

1. The usual general construction work for buildings and landscaping
2. Dams and other civil engineering structures
3. Sewage treatment plants and water treatment plants
4. Demolition (except where determined to be a separate contract)
5. Roadways and parking areas, including incidental drainage structures
6. Boiler plant chimneys
7. Install roof drains (furnished by PC)
8. Fences (not including fences for transformer stations)
9. Monorails
10. Fire extinguishers and cabinets
11. Steam and traffic tunnels
12. Stage equipment (excluding lighting equipment)
13. Laundry and dry cleaning equipment
14. Kitchen and cafeteria equipment; hood systems (fans, duct and hood) by HC
15. Laboratory equipment (Package systems by GC; hood component system by HC)
16. Elevators, dumbwaiters, escalators, chair lifts (or by separate contract, if applicable)
17. Fire protection and domestic water distribution system (including fire loops and hydrants), beyond 5'-0" outside building line
18. Water storage reservoirs, elevated tanks, standpipes (Note: If desirable this may be a separate .5 Contract)
19. Sanitary sewerage systems (beyond 5'-0" outside building line)
20. Storm water systems (beyond 5'-0" outside building line)
21. Well drilling for water supply (if separate contract is not desirable)
22. Louvers and similar items that affect building appearance (some furnished to GC by other Primes)
23. HazMat abatement including asbestos, lead, PCB, radon and others (except where determined to be a separate contract)
24. Gas distribution system from the main to the meter
25. Foundations and/or supports for all heavy equipment
26. Fuel tanks for vehicle refueling

27. Install sleeves (furnished by HC, PC, and EC)

B. HEATING, VENTILATING AND AIR-CONDITIONING CONSTRUCTION CONTRACT (.2):

1. The usual heating, ventilating and air conditioning work, including controls
2. Boilers, breaching and incidental piping, heaters and pumps
3. Site distribution of steam, condensate, hot water, and chilled water (tunnels are under the GC Contract)
4. Heating work for control buildings of sewage treatment plants
5. Coal and ash handling equipment for boiler plants
6. Refrigeration equipment (not kitchen refrigeration equipment)
7. Lightweight equipment supports and housekeeping pads
8. Boiler plant and HVAC equipment controls
9. Intake and exhaust louvers, with or without dampers, for HC work (installed by GC)
10. Ductwork for interior generators
11. All fuel tanks and fuel lines (except for vehicle refueling tanks and other isolated specialty tanks under .1 contract)
12. Cathodic protection for steel tanks
13. Furnish and install interior generator exhaust piping with insulation
14. Well drilling and pipe installation for geothermal systems
15. HVAC connections for kitchen equipment, laboratory equipment, dental equipment, laundry equipment, and any equipment provided by others that requires HVAC connections
16. Kitchen hood systems (hood, ductwork, exhaust fan and controls)
17. Laboratory hood systems (hood, ductwork, exhaust fan and controls)
18. Electric resistance heating (unless otherwise approved by DGS)
19. Snow melting systems
20. Lightweight equipment supports and housekeeping pads
21. Hazmat work associated with HC work

C. PLUMBING CONSTRUCTION CONTRACT (.3):

1. The usual plumbing work for buildings including water, sanitary and rain water conductors for building systems, within 5' of the exterior building line
2. All gas piping and connections for building systems and electric power generators from the gas meter to the service point
3. Water treatment equipment
4. Sterilizing equipment
5. Compressed air systems
6. Vacuum systems
7. Air-conditioning drainage systems
8. Distilled water systems
9. Grease, oil and lint trap systems within buildings and grease/oil traps and piping exterior to buildings.
10. Roof drains (furnished by PC, installed by GC)
11. Rain water conductors from roof drains
12. Fire suppression system (except where determined to be a separate .5 contract)
13. Lightweight equipment supports and housekeeping pads
14. Hazmat work associated with PC work
15. Testing, disinfection of water system, adjusting and placing in operation all systems installed

D. ELECTRICAL CONSTRUCTION CONTRACT (.4):

1. The usual electrical work for buildings including power, lighting, communications, security and fire alarm
2. Electrical service entrance
3. Transformer stations complete, including fences
4. Electrical work for hazard lighting of elevated tanks and chimneys
5. Electrical work in connection with sewage treatment plants (not electrically operated equipment)

6. Site lighting
 7. Electric power generators and transfer switches, including sub-base tanks, mufflers, exhaust piping and outdoor enclosures (furnish day tank and muffler to HC).
 8. Electrical power, starters, overload protection and disconnecting means for all HVAC and Plumbing equipment where not furnished integral to the equipment
 9. Telecommunications structured cabling pathways, provide cabling, outlets and terminals unless otherwise directed.
 10. Fire alarm systems including connections for elevators, air handling equipment and door hardware
 11. Security including access control, video surveillance systems and intrusion/various alarms.
 12. Nurse call and other specialized communication systems
 13. Electrical connections for kitchen equipment, laboratory equipment, dental equipment, laundry equipment, and other equipment furnished by others that requires electrical connections
 14. Lightweight equipment supports and housekeeping pads
 15. Hazmat work associated with electrical equipment removal or installation
 16. Lightning protection (or by separate contract, if applicable)
- E. MISCELLANEOUS CONSTRUCTION CONTRACT (.5): (used when specialty work is so extensive that a separate contract is warranted)
1. Sprinkler System
 2. Kitchen
 3. Demolition
 4. Heavy Construction
 5. Lightning protection
- F. HAZMAT CONSTRUCTION CONTRACT (.6): (used when specialty work is so extensive that a separate contract is warranted)
1. Asbestos Abatement
 2. All other HazMat Abatement including lead, PCB, radon, etc.

CHAPTER 3

PROGRAMMING SUBMISSION

SECTION 300 - GENERAL

300.1 PURPOSE. The Programming Stage includes gathering project information, clarifying the Project requirements, and proposing design options. The Department will provide a "Project Program Statement (PPS)" during the Professional selection stage of the Project describing the intended scope of work, for the project. The PPS statement may contain background and justification for the Project; and work items contained in the Project and general building or site size or area requirements. For new construction and major rehabilitation projects, the PPS will describe proposed program activities, space requirements, and equipment needs. The PPS will be discussed at the Orientation conference and/or initial site visit.

- A. The Professional shall meet and work with the Client Agency to determine detailed program requirements, and shall refine and complete the program as described in this Manual. The Programming submission will include: the refined program, conceptual design studies including various design options, and a probable construction cost. Programming submission documents are to present design concepts based upon the program, construction allocation, site location, and other factors derived from the pre-design activities. The drawings for each concept are to present the general type of construction proposed, the basic HVAC, plumbing and electrical system concepts and the relationship of the facility to the site. Drawings should be simple presentations, easily modified as the design evolves.

300.2 THE PROGRAM. The Program shall reflect the Department's objectives, schedule, constraints, applicable codes, and design criteria, including space requirements and relationships, special equipment, systems and site conditions, and including but not limited to local zoning, utilities, permits and all state and federal regulatory approvals. The Professional is to translate the raw data gathered from the Client Agency and Institution into organizational relationships and functions, establish net and gross areas and volumes, resulting in a project space definition with a probable construction cost. The Client Agency and Institution will provide the raw space data such as basic functional units, approximate number of occupants for each, and special equipment or space requirements for each. The Professional is to assist the Client Agency to adjust and reduce its program, when the Probable Construction Cost exceeds 90% of the Base Construction amount.

- A. If it becomes necessary to delete portions of the Client Agency's Program Scope in order to provide Concept Designs that meet the cost limitation, the Professional shall work with the Client Agency to plan for possible adjustments to the design which may become the basis for the ascending Base Bids required at later stages.

300.3 CONCEPT DEVELOPMENT MEETINGS. The Professional is to meet as often as necessary with the Client Agency while developing conceptual studies to generate ideas, accumulate data, analyze and resolve planning problems, and make program and planning determinations. Programming concepts and schematic drawings should be the foundation for the Schematic Design. Concepts should address land utilization, relationships with existing and future improvements, and economical realization of the program.

300.4 CONCEPT DESIGN STUDIES. In accordance with the accepted Program, the Professional shall prepare and submit to the Department and the Client Agency, multiple concept design options, at least three (3), unless otherwise approved by the Design Manager, consisting of site concepts, bubble diagrams, shape and size, sufficient to demonstrate an understanding of the program, and such other graphic and narrative information as is necessary to describe fully each option. The Professional shall provide an explanation of each of the concept design options, and shall indicate which option is the Client Agency's preferred solution, and provide written explanation of reasons for its selection. These options shall consider land use, the environment, master plans, traffic, parking, transportation, utilities, and functional relationships within the Project and building systems. Along with each option, the Professional shall prepare and submit to the Department a Statement of Probable Construction Cost.

300.5 SUBMISSION TO THE BUREAU OF PRE-CONSTRUCTION. Applicable Programming Submission Documents are to be delivered to the Design Manager on or before the date established in the milestone

schedule, unless another date has been approved by the Department. Delivery shall be made by uploading the required submission documents into e-Builder.

Note: The DGS Modernization process and the use of e-Builder process management software may require revisions to the instructions to the Professional regarding Design Submissions to DGS and to the Client Agencies.

300.6 SUBMISSION TO CLIENT AGENCY. Design Submissions will be made through e-Builder. Upon DGS acceptance of the Submission, the Design Manager will release the submission documents for review by the Client Agency.

300.7 ENGINEERING PROJECTS. The requirements for engineering projects like dams and State Parks may differ from building projects, and their design submission instructions will be given to the Professional at the Orientation Conference.

300.8 REVIEW CONFERENCE. If necessary, a conference to review the Programming Submission with the Professional, the Client Agency, the Institution and the BOPC (along with the Department's consultants) will be scheduled by the BOPC. The conference will normally occur approximately two (2) to three (3) weeks after the submission and is held at the BOPC's office in Harrisburg. The option of video conferencing or conducting the review conference at the project site is at the discretion of the Design Manager. The Professional and its consultants must attend.

300.9 CONSTRUCTION MANAGER (CM) AND COMMISSIONING AGENT (CA). When the Department has engaged a Construction Manager and/or a Commissioning Agent, the Design Manager will, upon DGS acceptance of the Submission, release the submission documents for review by the Construction Manager and/or Commissioning Agent.

SECTION 301 - PROGRAMMING SUBMISSION DOCUMENTS

301.1 PROGRAMMING SUBMISSION PACKAGE. On the scheduled date of the Programming Submission, the Professional shall upload the Submission Package to the Bureau of Pre-Construction, through e-Builder, including the following:

- A. The Programming Documents, including site requirements and detailed building space requirements.
- B. All Conceptual Design Drawings.
- C. The Programming Submission Probable Construction Cost Summary (for each design concept option), with Project Information Sheet. For blank forms see Exhibit B1, Programming Submission – Probable Construction Cost Summary and Exhibit B2, Programming Submission – Project Information, included in e-Builder.
- D. A Statement of Expected Availability of required utilities (Electric, Gas, Water, Sewer, Telephone, Cable TV, etc.) for the Project, from the Professional, based on site visit and review of available information. Provide a separate report for each utility. Include a completed copy of Exhibit F4, List of Utility Approvals.
- E. A Report on Site Restrictions, including zoning, land development, flood plains, waterways, wetlands, hazardous materials, sinkholes, rock outcroppings, endangered species, historical/archaeological significance, etc. Include a completed Exhibit F3, List of Regulatory Approvals/Permits – Status Report along with a written narrative on approvals/permits required, references to applicable building codes, local zoning ordinance, and land development requirements. Include anticipated permit fees, review timing form application to approval/permit issue and any other pertinent information.
- F. A proposed Overall Project Schedule, from commencement of Design through Construction. Schedule format is at the Professional's option but a bar chart type schedule is acceptable. The

schedule must include but is not limited to all activities and milestones associated with the following activities: each design submissions, project site meetings and meetings with the Client Agency, all permits and approvals, all utility confirmations and agreements, post stormwater agreement if applicable, all additional services work orders, bid advertisement, bid receipt and award of construction contracts, start and completion of construction.

- G. A set of photographs of proposed sites of new structures or additions to an existing structure. These photographs shall show a minimum of four (4) views of each site and shall be keyed to the site plans. Provide photographs of existing conditions in all affected areas for renovations projects.
- H. A Report on the Status of LEED Efforts for the Project (when applicable). Describe LEED goals, and the planned approach to accomplishing those goals. Also, indicate whether the Professional has staff experienced in the LEED process, or if it will need to have a LEED Consultant.
- I. A Report on Current and Anticipated Additional Services, including but not limited to, Property Survey, Geotechnical Investigation, Hazardous Materials Survey, LEED Related Activities, etc.
- J. Additional Items requested by the Design Manager, or otherwise determined by the Professional to be required for the Project. Contact the Design Manager for directions on which e-Builder documents file folder to use for each item.

301.2 CONCEPTUAL DESIGN DRAWINGS. Conceptual Design Options must include the following information:

- A. Overall site plan(s) for each Concept Option, at a scale appropriate to show the following information:
 - 1. North Arrow
 - 2. Tract Boundaries
 - 3. Total Tract acreage
 - 4. Existing topography, showing contours at a maximum of two (2) foot intervals
 - 5. Existing structures, utilities, easements, rights-of-way, natural site features (woods, streams, suspected wetlands, floodplains, etc.)
 - 6. Proposed new structures and site improvements, and indicating the Project's relationship to surrounding improvements and conditions
 - 7. Approximate Limit of Contract line. The Limit of Contract line must encompass the Work of all Contracts (providing sufficient clearances for the Contractors to perform the Work), and shall include trailers, laydown areas, storage areas, and temporary utilities and facilities
- B. Bubble diagrams showing spatial and organizational relationships. The projected gross square footage must be indicated. Single line floor plans are also acceptable.
- C. Conceptual building elevations showing building massing, and materials.
- D. Conceptual building sections sufficient to indicate arrangement, volumes and relationship of spaces.

301.3 PROBABLE CONSTRUCTION COST. The Probable Construction Cost, which must be within the Base Construction Amount, shall be submitted for each Concept Option, on the form provided as Exhibit B1, Programming Submission - Probable Construction Cost Summary included in e-Builder, and must be signed by the Professional. The estimate is to indicate an overall square foot construction cost, based on current costs for the intended size, shape, configuration, and building type, plus escalation to the midpoint of construction.

- A. Along with the Probable Construction Cost, the Professional must submit completed copies of applicable Project Information forms. For blank forms see Exhibit B2, Programming Submission – Project Information, included in e-Builder.

301.4 EXISTING FACILITIES. Where existing facilities are to be retained, altered, repurposed, or modified, the pertinent information shall be indicated on site plans, floor plans and/or other diagrams.

SECTION 302 - REGULATORY APPROVALS

302.1 REQUIREMENTS. The Professional should refer to the General Conditions to the Agreement for Professional Services and this Manual, relative to required submittals to applicable agencies in a timely manner. At the Programming Stage the Professional must become familiar with the applicable building codes, the local zoning ordinance, and land development requirements, prior to beginning conceptual studies.

SECTION 303 – UTILITY SERVICES

303.1 REQUIREMENTS. During the Programming Stage, the Professional gathers information. The Professional discusses the intent of the Client Agency regarding utilities for the project, and investigates the availability of all utilities that will be required for the project. Refer to Chapter 13 for more information regarding Utility Services.

- A. The Programming Submission package must include the Professional's Statement of Expected Availability of Required Utilities.
- B. If a potable water well is determined to be necessary to provide water for the site, a draft RFP for additional services to perform the well drilling and testing should be submitted at this time.
- C. If an on-lot septic system is determined to be necessary for the site, provide a copy of correspondence or meeting minutes with the local Sewage Enforcement Officer discussing the type(s) of systems that are typically permitted in the area and the requirements and procedures to follow for testing, designing and permitting a system.

SECTION 304 – REVIEW, APPROVALS AND POST-CONFERENCE ACTIVITIES

304.1 SUBMISSION REVIEW. The Professional uploads the submission to e-Builder. The Design Manager reviews the acceptability of the submission and if found to be apparently acceptable, the Design Manager releases the submission for review by the Client Agency and the Review Team. All reviewer comments and the Professional's responses to the comments are input to a template in e-Builder. The Professional must provide an explanation for any review comment that cannot be complied with in the next submission.

304.2 CLIENT AGENCY APPROVAL. The Client Agency's approval must be provided before the Department will approve the Programming Submission. The Client Agency shall issue its Approval in e-Builder.

304.3 DGS APPROVAL. Official approval is not given at the Review Conference. Programming Submission approval, conditional acceptance, or rejection and instructions for further project development are issued by the Design Manager through e-Builder, following the Review Conference. As per the General Conditions to the Agreement for Professional Services, the Professional shall only invoice up to 90% of the portion of the Professional fee applicable to the Programming Stage, until the Design Manager approves the submission. Approval of the Programming Submission by the Design Manager is based upon the Professional making all changes requested or required during further developmental stages of the project as part of Basic Services. If the Statement of Probable Construction Cost at the Programming Stage for all concepts exceeds 100% of the Base Construction amount, the Submission will be rejected and the Professional shall revise the Project program, scope, size or quality, as approved by the Department.

304.4 MINUTES. The Professional shall furnish minutes of the Programming Review Conference by uploading to e-Builder within seven (7) days following the Conference. The Professional's post-conference comments, included with the meeting minutes, shall be identified as not a part of the meeting minutes.

304.5 DEVELOPMENT MEETINGS. The Professional shall meet with the Client Agency, as frequently as needed, while developing the Project from Programming to Schematic Design Stage. These meetings are to obtain the Client Agency's requirements and instructions, resolve planning and program issues, resolve budgetary issues, and ensure that all needs are addressed. Provide meeting minutes as required in Chapter 1.

CHAPTER 4

SCHEMATIC DESIGN SUBMISSION

SECTION 400 - GENERAL

400.1 PURPOSE. The Schematic Design purpose is to illustrate the concept, scope, scale and relationship of the Project components, and the Probable Construction Cost. The Schematic Design documents are to present the design concept based upon the Program, Base Construction Amount, site location and other factors derived from the Programming Stage. The Schematic Design is to present the general type of construction proposed, the basic HVAC, plumbing and electrical system concepts and the relationship of the facility to the site.

400.2 SUBMISSION TO THE BUREAU OF PRE-CONSTRUCTION. Applicable Schematic Design Submission documents are to be uploaded in e-Builder on or before the date established in the milestone schedule, unless another date has been approved by DGS.

Note: The DGS Modernization process and the use of e-Builder process management software may require revisions to the instructions to the Professional regarding Design Submissions to DGS and to the Client Agencies.

400.3 SUBMISSION TO CLIENT AGENCY. Design Submissions will be made through e-Builder. Upon DGS acceptance of the Submission, the Design Manager will release the submission documents for review by the Client Agency.

400.4 ENGINEERING PROJECTS. The requirements for engineering projects like dams and State Parks may differ from building projects, and their design submission instructions will be given to the Professional at the Orientation Conference.

400.5 REVIEW CONFERENCE. A conference to review the Schematic Design Submission with the Professional, the Client Agency, the Institution and the BOPC (along with the Department's consultants) will be scheduled by the BOPC. The conference will normally occur approximately two (2) to three (3) weeks after the submission and is held at BOPC's office in Harrisburg. The option of video conferencing or conducting the review conference at the project site is at the discretion of the Design Manager. The Professional and its consultants must attend.

400.6 CONSTRUCTION MANAGER (CM) AND COMMISSIONING AGENT (CA). When the Department has engaged a Construction Manager and/or a Commissioning Agent, the Design Manager will, upon DGS acceptance of the Submission, release the submission documents for review by the Construction Manager and/or Commissioning Agent.

SECTION 401 - SCHEMATIC DESIGN SUBMISSION DOCUMENTS

401.1 SCHEMATIC DESIGN SUBMISSION PACKAGE. On the scheduled date of the Schematic Design Submission the Professional shall upload the Submission Package to the Bureau of Pre-Construction through e-Builder, including the following:

- A. The Code Review and Analysis, in which the Professional shall identify all codes applicable to the Project, and shall provide a detailed review and analysis of the important requirements of each code, as they apply to the Project's occupancy type, construction type, etc.
- B. The Schematic Design Submission Probable Construction Cost Summary for each Base Bid with Project Information Sheets. For blank forms see Exhibit B3, Schematic Design Submission – Probable Construction Cost Summary and Exhibit B4, Schematic Design Submission – Project Information, included in e-Builder.
- C. A draft Project Manual Cover, Table of Contents, and one complete sample technical section.

- D. All Schematic Design Drawings, including Cover Sheet. See Chapter 8 for the drawing format.
- E. All estimated loads, telephone call reports, and Notification Letters to all Utility Companies (Electric, Gas, Water, Sewer, Telephone, Cable TV, etc. as applicable). Utility Company reply letters confirming service, should be included if available. Refer to Chapter 13 for Utility Requirements. Include a completed copy of Exhibit F4, List of Utility Approvals.
- F. The Fuel Feasibility Study (when requested); refer to Chapter 13 for detailed instructions.
- G. Coal Fuel Non-Use Justification Letter (where applicable); refer to Chapter 13 for detailed instructions.
- H. The Structural Engineers' Initial Subsurface and Related Site Investigation Reports, and Professional's Request for Proposals for Geotechnical Services. Include stormwater infiltration testing and septic on-lot testing, as applicable. See Exhibit G1, Instructions for Geotechnical Services and Sample RFP, included in e-Builder.
- I. A Preliminary Stormwater Report to include hydraulic calculations, pipe sizing and routing calculations, pipe material, basin sizing and routing calculations, infiltration calculations, etc.
- J. A List of Regulatory Approvals/Permits – Status Report (See Exhibit F3, List of Regulatory Approvals/Permits – Status Report, included in e-Builder) that lists all regulatory approvals and permits the Professional recognizes as necessary for the Project. Include actual and anticipated application/submission dates, resubmission dates, and final approval/permit dates. In addition, copies of all approval/permit application packages submitted during this design period and copies of all approval/permits received during this design period shall be included with the submission.
- K. The initial contact letter to Pennsylvania Historical and Museum Commission.
- L. A proposed Overall Project Schedule, from commencement of Design through Construction. Schedule format is at the Professional's option but a bar chart type schedule is acceptable. The schedule must include but is not limited to all activities and milestones associated with the following activities: each design submissions, project site meetings and meetings with the Client Agency, all permits and approvals, all utility confirmations and agreements, post stormwater agreement if applicable, all additional services work orders, bid advertisement, bid receipt and award of construction contracts, start and completion of construction.
- M. A Report on the Status of LEED Efforts for the Project (when applicable). Describe LEED goals, and the planned approach to accomplishing those goals. Include a LEED Scorecard indicating the points to be obtained, and a supporting narrative describing how those points will be obtained.
- N. A Report on Current and Anticipated Additional Services, including but not limited to, Property Survey, Geotechnical Investigation, Hazardous Materials Survey, LEED Related Activities, Quality Assurance Services, Potable Water Well Drilling/Testing, On-Lot Septic System Testing, etc. Include an RFP for on-lot testing, when applicable.
- O. A set of photographs of proposed sites of new structures or additions to an existing structure. These photographs shall show a minimum of four (4) views of each site and shall be keyed to the site plans. Provide photographs of existing conditions in all affected areas for renovations projects. (Not required for this Submission, if previously provided.)
- P. Additional Items, as applicable:
 - 1. The initial project report for flood control and/or water resources projects.
 - 2. The initial report of water supply facilities.
 - 3. The initial report on sewerage facilities.
 - 4. Other additional items requested by the Design Manager, or otherwise determined by the Professional to be required for the Project.

401.2 CIVIL SITE PLANS. All Site Plans shall reflect the proper division of work, as described in Chapter 2. Multi-discipline Site Plans may be used only at the discretion of the Department, and only when all pertinent work can be clearly shown and identified as applicable to each Contract. Otherwise, Site Plans for individual Contracts are required. Site Plans must include the following minimum information, as well as any requirements of the local municipality's "Subdivision and Land Development Ordinances – Preliminary Plan Submission":

See PPM
Addendum, June
9, 2017, Item 1
for changes to
Paragraph 401.2.

- A. Plans must include one or more of the following items:
1. Scale no smaller than 50 feet to the inch
 2. North point, scale and date of preparation
 3. Reference to Deed Book, volume and page
 4. Total Tract Acreage
 5. Proposed Acreage of the Site Improvements
 6. Symbol Legend
- B. Overall Site Plan - showing the Project's relationship to surrounding improvements and conditions and including the tract boundaries with metes and bounds of the property/campus, easements, rights-of-way, contractor staging area and the Limit of Contract line. The Limit of Contract line must encompass the Work of all Contracts (providing sufficient clearances for the Contractors to perform the Work), and shall include trailers, laydown areas, storage areas, temporary utilities and facilities.
- C. Existing Conditions/Demolition Site Plan - Existing site features (i.e. - existing trees and vegetation, buildings, topography at a maximum two (2) foot interval (including source of survey, date of survey, datum and benchmark locations and description), utilities (to include on lot water supply and/or septic systems), stormwater management features, water features (creeks, streams, ponds, lakes, rivers, etc.), flood plains, property monuments, iron pin markers.
- D. Grading and Drainage Plan - showing existing and new topographic contours, at maximum two (2) foot intervals, existing and new building floor elevations and proposed storm drainage structures and management features.
- E. Proposed Site Improvements Plan - showing new structures, and other site improvements such as roads and parking lots, sidewalks, landscape items, etc.
- F. Proposed Utility Plan - showing existing and new above and belowground utilities with points of attachment to site facilities and utility mains (to include on lot water supply and/or septic systems). The Utility Plan is to include utilities to be provided by all Contractors, for coordination purposes, with clear notation that the actual work for Contractors other than the GC is shown on their respective site plans.
- G. Landscaping Plan (if applicable) - showing proposed layout of plantings, a legend of planting symbols, planting schedule and construction details.
- H. Construction Details – Provide preliminary applicable construction details for all civil site work proposed. References to other standard details are not allowed (i.e. - PennDOT RC-72 details, BC-700, etc.) a copy of the standard details must be provided on the drawings.

401.3 FLOOR PLANS. Plans are to be minimum 1/8" = 1'-0" scale, showing approximate wall thicknesses. A plan for each floor and roof must be provided. Renovations, alterations, and demolition plans may be single line drawings superimposed on existing drawings. Floor plans shall show the relative space, size and location of all major mechanical/HVAC, plumbing, electrical, telephone, equipment rooms, and establish space and location for circulation and other non-programmed spaces, as well as all programmed space. The projected ratio of gross square footage to net square footage (e.g. 100,000 gsf: 85,000 nsf) must be indicated on each Floor Plan. Consideration of a suitable foundation and conceptual structural system is to appear on the drawings.

401.4 ELEVATIONS AND SECTIONS. Principle building elevations must be shown. Significant longitudinal and lateral building sections must be shown in sufficient detail to indicate arrangement, volumes and relationship of spaces. Include a typical wall section to show each type of construction intended.

401.5 HVAC, PLUMBING, AND ELECTRICAL SYSTEMS. Drawings shall indicate the general arrangements of HVAC, plumbing and electrical system being provided. Statements of reasoning justifying the selection of the proposed systems shall be provided.

401.6 EXISTING FACILITIES. Where existing facilities are to be retained, altered, or modified, the pertinent information shall be indicated on site plans, floor plans and/or other diagrams/plans.

401.7 PROBABLE CONSTRUCTION COST. The Probable Construction Cost Summary Sheets (one for each Base Bid) must be submitted and must be signed by the Professional. Refer to Exhibit B3, Schematic Design Submission – Probable Construction Cost Summary, included in e-Builder. The estimate is to indicate square foot costs based on current prices. An escalation factor will then be added, projected to the mid-point of construction to provide a Total Construction Cost.

- A. Along with the Probable Construction Cost Summary Sheets, the Professional must submit completed copies of applicable Project Information forms.
- B. A minimum of three (3) Base Bids within the Base Construction Amount (BCA) will be required, unless otherwise approved by the Design Manager. Base Bids must be additive and ascending. Base Bid No. 1 shall be approximately 90% of the BCA, but not more than 95% of the BCA. A Base Bid No. 4 may be permitted, if approved by the Design Manager, but shall not exceed 105% of the Base Construction Amount. If the Statement of Probable Construction Cost for the three (3) required Base Bids do not conform to the requirements detailed above, the Submission will be rejected and the Professional shall revise the Project scope, size or quality, as approved by the Department. Alternates are not used by DGS.
 - 1. The project will require a prioritization of scope in order to maintain the project budget. As part of Basic Services, the Professional shall prioritize scope into additive and ascending Base Bids, to be further refined during each stage of the design process. Deduct base bids shall not be used. This prioritization will provide the Department and the Client Agency a clear understanding of the Project's scope, priorities and bidding strategy. The extent of the prioritized scope may exceed the BCA in the initial submission. Any design work removed from the project to maintain the construction budget will not require further development.

SECTION 402 - REGULATORY APPROVALS

402.1 REQUIREMENTS. The Professional should refer to the General Conditions to the Agreement for Professional Services and this Manual, relative to required submittals to applicable agencies in a timely manner. The following regulatory submissions are required during the Schematic Design Submission:

- A. Zoning Variance or Special Exception Requests
- B. Conditional Use Requests
- C. Land Development/Subdivision Preliminary Submission

402.2 DEPARTMENT NOTIFICATION. If a regulatory requirement substantially increases the cost of the Project, or if any required approval is withheld by any Agency, the Professional shall immediately notify the Design Manager.

402.3 LIST OF REQUIRED PERMITS. With the Schematic Design Submission, the Professional shall include a list of all required approvals/permits with a schedule of dates. See Exhibit F3, List of Regulatory Approvals/Permits – Status Report, included in e-Builder. Information concerning application documents and other requirements for each approval and permit is to accompany the list. Indicate real and anticipated dates for each step of the submission and approval process (including application, comments received, resubmission with comments addressed, approval), for each required permit/approval.

402.4 COAL-FIRED SYSTEMS. If the Project contains Coal-Fired Boilers, and/or Incinerators, the Professional shall discuss the Project with the appropriate regional office of the DEP, Bureau of Air Quality

Control. The Professional shall make application for a permit in accordance with the latest rules and regulations. A copy of the approved application must be submitted with the Construction Documents Submission.

SECTION 403 - UTILITY SERVICES

403.1 REQUIREMENTS. During the Schematic Design Stage, the Professional estimates a preliminary load for each utility required for the project. The Professional establishes a point of contact with each utility, and describes the proposed project, its location, load estimate, and schedule. The Professional requests utility confirmation that required service can be extended to supply the project. Initial contact by telephone (multiple telephone calls may be required) shall be confirmed with a notification letter to each municipality. Professional should advise utilities to respond in writing within three (3) to four (4) weeks with proposed service information. Where the utility service is from a campus or institution system, the Client Agency shall determine if the capacity and the distribution system at the point of connection is adequate for the new load determined by the Professional. Where it is determined that service is not available adjacent to the site, the Professional shall determine what is required off-site to provide service, confirm that the utility company has the capacity at the off-site point of connection and, if there is a cost to the Project, include it in the estimate. The Professional and the Client Agency should also consider the possibility and/or practicality of on-site systems for services such as water and sewer. Refer to Chapter 13 for more information regarding Utility Services.

- A. The Schematic Design Submission package should include the Professional's estimated load for each utility, a telephone call report for each utility contacted, and a copy of the notification letter sent to each utility. The telephone call report should include: name and address of utility company, date called, utility company representative name and telephone number, and a written narrative of the telephone discussion. Utility reply letters confirming service should be included, if available.

SECTION 404 - REVIEW, APPROVALS AND POST-CONFERENCE ACTIVITIES

404.1 SUBMISSION REVIEW. The Professional uploads the submission to e-Builder. The Design Manager reviews the acceptability of the submission and if found to be apparently acceptable, the Design Manager releases the submission for review by the Client Agency and the Review Team. All reviewer comments and the Professional's responses to the comments are entered to a template in e-Builder. The Professional must provide and explanation for any review comment that cannot be complied with in the next submission.

404.2 CLIENT AGENCY APPROVAL. The Client Agency's approval must be provided before the Department will approve the Schematic Design. The Client Agency shall issue its Approval in e-Builder.

- A. In the case of projects for the Pennsylvania State University, the Professional, as part of his basic services, is to prepare presentation drawings for the University Board, including a black and white perspective sketch, for review and approval. These presentation drawings will be required at some point following the Schematic Design Submission.

404.3 DGS APPROVAL. Official DGS approval is not given at the Review Conference. Schematic Design approval, conditional acceptance, or rejection and instructions for further Project development are issued by the BOPC through e-Builder, following the Review Conference. As per the General Conditions to the Agreement for Professional Services, the Professional shall only invoice up to 90% of the portion of the Professional fee applicable to the Schematic Design Stage, until the Department approves the submission. Approval of the Schematic Design Submission by DGS is based on all changes requested or required for further development being incorporated into the design documents.

404.4 MINUTES. The Professional shall furnish minutes of the Schematic Design Review Conference by uploading to e-Builder, within seven (7) days following the Conference. Professional's post-conference comments, included with the meeting minutes, shall be identified as not a part of the meeting minutes.

404.5 SUBSURFACE AND OTHER INVESTIGATIONS. Immediately after the Schematic Design approval, the Professional must engage the services of geotechnical, hazardous materials and other consultants, as directed in Chapter 13, and as necessary to maintain schedule.

404.6 DESIGN MEETINGS. The Professional shall meet with the Client Agency and the Institution, as frequently as needed, while developing the project from Schematic Design Stage to Design Development

Stage. These meetings are to obtain the Client Agency's requirements and instructions, resolve planning and program issues, resolve budgetary issues, and ensure that all needs are addressed. Provide meeting minutes as required in Chapter 1.

See PPM Addendum, June 9, 2017, Item 2 for added Paragraph 404.7.

CHAPTER 5

DESIGN DEVELOPMENT SUBMISSION

SECTION 500 - GENERAL

500.1 PURPOSE. The Design Development Submission purpose is to fix and describe the size and character and Estimated Construction Cost of the entire Project as to Architectural, Environmental, Civil, Structural, HVAC, Plumbing, and Electrical systems, materials and other elements as may be required. The design is to be based on the approved Programming analysis and Schematic Design, with continued development and refinement of the program and information supplied by the Client Agency and DGS. It should not be so all-inclusive as to result in wasted work should further project development require changes, but it should be sufficient to determine the design's adequacy and feasibility for construction.

500.2 SUBMISSION TO THE BUREAU OF PRE-CONSTRUCTION. Applicable Design Development Submission documents are to be uploaded to the BOPC on or before the date established in the milestone schedule, unless another date has been approved by DGS. Delivery shall be made by uploading the required submission documents into e-Builder.

Note: The DGS Modernization process and the use of e-Builder process management software may require revisions to the instructions to the Professional regarding Design Submissions to DGS and to the Client Agencies.

500.3 SUBMISSION TO CLIENT AGENCY. Design Submissions will be made through e-Builder. Upon DGS acceptance of the Submission, the Design Manager will release the submission documents for review by the Client Agency.

500.4 ENGINEERING PROJECTS. The requirements for engineering projects like dams and State Parks may differ from building projects, and their design submission instructions will be given to the Professional at the Orientation Conference.

500.5 REVIEW CONFERENCE. A conference to review the Design Development Submission with the Professional, the Client Agency, the Institution and the BOPC (along with the Department's consultants) will be scheduled by the BOPC. The conference will normally occur approximately two (2) to three (3) weeks after the submission and is held at the BOPC's office in Harrisburg. The option of video conferencing or conducting the review conference at the project site is at the discretion of the Design Manager. The Professional and its consultants must attend.

500.6 CONSTRUCTION MANAGER (CM) AND COMMISSIONING AGENT (CA). When the Department has engaged a Construction Manager and/or a Commissioning Agent, the Design Manager will, upon DGS acceptance of the Submission, release the submission documents for review by the Construction Manager and/or Commissioning Agent.

SECTION 501 - DESIGN DEVELOPMENT SUBMISSION DOCUMENTS

501.1 DESIGN DEVELOPMENT SUBMISSION PACKAGE. On the scheduled date of the Design Development Submission, the Professional shall upload the Submission Package to the Bureau of Pre-Construction, including the following:

- A. The Code Review and Analysis, if changed since previous submission.
- B. The Design Development Submission Probable Construction Cost Summary (for each Base Bid) with Project Information sheets. For blank forms see Exhibit B5, Design Development Submission – Probable Construction Cost Summary and Exhibit B6, Design Development – Project Information, included in e-Builder.
- C. Draft Project Manual including Table of Contents, first draft of Division 1 Specifications and first draft of all Technical Sections for all Prime Contracts. It is important for this submission to have the

Technical Specification Sections Part 2 product information sufficiently edited to provide an understanding of the intended products, equipment and materials being proposed for the Project.

- D. All Design Development Drawings, including the Cover Sheet. Refer to Chapter 8 for the drawing format.
- E. Confirmation Letters from each utility company (Electric, Gas, Water, Sewer, Telephone, Cable TV, etc., as applicable), indicating that the required service is available. If applicable, provide a written estimate for the Utility Company's cost to extend service to the building. Refer to Chapter 13 for Utility Requirements. Include a completed copy of Exhibit F4, List of Utility Approvals (included in e-Builder).
- F. A List of Regulatory Approvals/Permits – Status Report (See Exhibit F3, List of Regulatory Approvals/Permits – Status Report, included in e-Builder), with copies of all approvals/permits obtained to date. Include actual and anticipated application/submission dates, resubmission dates, and final approval/permit dates. Completed applications for regulatory approvals/ permits must be submitted to appropriate agencies with copies to DGS per the schedule established by the Professional but not less than thirty (30) days prior to Construction Documents Submission. In addition, copies of all permit application packages submitted during this design period shall be included with the submission.
- G. The Geotechnical Investigation and Geotechnical Report (when applicable, see Chapter 13).
- H. Subsurface Utility Investigation Report (when applicable).
- I. The Structural Engineer's Report on Selection of Structural and Foundation Systems, including cost comparisons, type, physical size and location of all structural members when applicable, based on the finding of Geotechnical Investigation and Geotechnical Report.
- J. Preliminary Engineering Calculations for Structural, HVAC, Plumbing and Fire Protection, and Electrical Systems; including preliminary sizing of major equipment items, systems and utility requirements (water demand calculations and well report if applicable, gas demand, sewage flow calculations, electrical load study, service sizing, emergency/standby generator sizing, etc.) and justification of system selection.
- K. Final Stormwater Report to include hydraulic calculations, pipe sizing and routing calculations, pipe material, basin sizing and routing calculations, infiltration calculations, etc.
- L. Final Erosion and Sedimentation Control Report.
- M. A Report on Hazardous Material Survey results with cover letter describing the Professional's solutions.
- N. The Response Letter from Pennsylvania Historical and Museum Commission.
- O. An updated Overall Project Schedule, from commencement of Design through Construction. Schedule format is at the Professional's option but a bar chart type schedule is acceptable. The schedule must include but is not limited to all activities and milestones associated with the following activities: each design submissions, project site meetings and meetings with the Client Agency, all permits and approvals, all utility confirmations and agreements, post stormwater agreement if applicable, all additional services work orders, bid advertisement, bid receipt and award of construction contracts, start and completion of construction. Discuss the proposed construction time period and construction sequencing with the DGS Regional Construction Director at the same time the Professional solicits input on the Division 1 Specifications as identified by the editorial comments included in the Department's Division 1 Specifications.
- P. A Report on the Status of LEED Efforts for the Project (when applicable). Describe LEED goals, and the planned approach to accomplishing those goals. Include a LEED Scorecard indicating the points to be obtained, and a supporting narrative describing how those points will be obtained.

- Q. A Report on Current and Anticipated Additional Services, including but not limited to, Property Survey, Geotechnical Investigation, Hazardous Materials Survey, LEED Related Activities, etc.
- R. Additional Items, where applicable:
1. The final report for Water Resources/Flood Control Projects.
 2. The detailed report on Water Supply Projects.
 3. The final report on Sewerage Facilities.
 4. Other additional items requested by the Design Manager, or otherwise determined by the Professional to be required for the Project.

See PPM Addendum, June 9, 2017, Item 3 for changes to Paragraph 501.2.

501.2 CIVIL SITE PLANS. All Site Plans shall reflect the division of work as described in Chapter 2. Multi-discipline Site Plans may be used only at the discretion of the Department, and only when all pertinent work can be clearly shown and identified as applicable to each contract. Otherwise, Site Plans for individual Contracts are required. Site plans must include the following minimum information as well as any requirements of the local municipality's "Subdivision and Land Development Ordinances – Final Plan submission":

- A. General Construction Civil Site Plans included with Schematic Design shall be further developed and new plans shall be added, to include one or more of the following items:
1. Scale no smaller than 50 feet to the inch
 2. North point, scale and date of preparation
 3. Reference to Deed Book, volume and page
 4. Total Tract Acreage
 5. Proposed Acreage of the Site Improvements
 6. Symbol Legend
- B. Overall Site Plan (Common Drawing to all Contracts) - showing the Project's relationship to surrounding improvements and conditions and including the tract boundaries with metes and bounds of the property/campus, easements, rights-of-way, contractor staging area and the Limit of Contract line. The Limit of Contract line must encompass the Work of all Contracts (providing sufficient clearances for the Contractors to perform the Work), and shall include trailers, parking areas, laydown areas, storage areas, temporary utilities and facilities. Also include a listing of all utilities, addresses, phone numbers, contact persons and the PA One Call information and serial number(s) for the project.
- C. Existing Conditions/Demolition Site Plan - Existing site features (i.e. - existing trees and vegetation, buildings, topography at a maximum two (2) foot interval (including source of survey, date of survey, datum and benchmark locations and description), utilities (to include on lot water supply and/or septic systems), stormwater management features, water features (creeks, streams, ponds, lakes, rivers, etc.), flood plains, property monuments, iron pin markers. Include wetlands if the delineation is negotiated as part of Basic Services or authorized as an Additional Service.
- D. Proposed Site Improvements Plan - showing new structures, and other site improvements such as roads and parking lots, sidewalks, landscape items, etc.
- E. Grading and Drainage Plan - showing existing and new topographic contours, at maximum two (2) foot intervals, existing and new building floor elevations, spot grades and proposed storm drainage structures and management features.
- F. Proposed Utility Plan - showing existing and new above and belowground utilities with points of attachment to site facilities and utility mains (to include on lot water supply and/or septic systems). The Utility Plan is to include utilities to be provided by all Contractors, for coordination purposes, with clear notation that the actual work for Contractors other than the GC is shown on their respective site plans.
- G. Profile Plans – Profiles are to be provided for all proposed streets, access drives, stormwater facilities and sanitary sewers.

- H. Landscaping Plan (if applicable) - showing proposed layout of plantings, a legend of planting symbols, planting schedule and construction details.
- I. Proposed Soil Erosion and Sediment Control Plans – to include all plan sheets, notes sheets and detail sheets.
- J. Test Boring Plan(s) and Logs – Test boring plan(s) and logs are to be provided.
- K. Construction Detail Plans - Provide all applicable construction details for all civil site work proposed. References to other standard details is not allowed (i.e. - PennDOT RC-72 details, BC-700, etc.) a copy of the standard details must be provided on the drawings. Indicate on the appropriate plans where details apply.

501.3 HVAC SITE PLANS. The routing and depth of all existing and new underground HVAC services and structures must be shown. Points of possible conflict (i.e., crossovers, etc.) with work of other disciplines shown, inverts given, and clearances must be worked out. Preliminary details of connections to utility companies' lines, manholes, and building entrances must be shown. Locations of all lines must be coordinated with the General Construction Utility Plan, where all GC, HVAC, Plumbing and Electrical utilities are shown.

501.4 ELECTRICAL SITE PLANS. The origins of Electrical Power, Communications, Signal and other systems must be shown. The proposed routings of underground and overhead lines must be shown. Manholes, handholes, pad-mounted transformers, building service entrance points, exterior sub-stations, etc. must be shown. Proposed locations of roadway, parking area, and exterior security lighting fixtures must be shown. Locations of all lines must be coordinated with the General Construction Utility Plan, where all GC, HVAC, Plumbing and Electrical utilities are shown.

501.5 BUILDING DRAWINGS. Dimensioned plans, sections and key details are to be developed in number and detail sufficient to establish the designer's intent, adequacy of space, feasibility of construction, construction methods and materials, and reasonableness of cost estimate. Plans shall be 1/8" = 1'-0" scale or larger. Refer to Chapter 8 for drawing format. Specific context requirements follow.

- A. Existing Facilities: Where existing facilities are to be retained, altered, modified or demolished, indicate the pertinent information on site plans, floor plans and/or riser diagrams. Separate work by discipline.
- B. General Construction: Foundation plans, floor plans, roof plans, framing plans (showing type, depth and location of all members), elevations, building sections, typical wall sections, key details and other drawings needed to show the building's general assembly methods and materials are expected. Dimensions of spaces and building components shall be sufficient for the Professional to determine preliminary gross-to-net volume and area ratios and the fit of programmed spaces. The projected ratio of gross square footage to net square footage must be indicated on each overall Floor Plan (e.g. 100,000 gsf: 85,000 nsf). For renovation projects, ratios shall be based on existing square footage and any new additions.
- C. HVAC and Plumbing: Typical areas, sizing and space requirements for grilles, diffusers, heating and cooling units, etc. are to be shown. Single line routing of major duct runs and piping must be shown. The Professional must coordinate with other disciplines to establish ceiling depths, chases, shafts and other service spaces and clearances. The Professional must indicate methods of environmental systems and controls for all spaces including Telecommunication Equipment Rooms, Electrical Equipment Rooms, Emergency or Standby Generator Rooms, Elevator Machine Rooms, Transformer Vaults and other like spaces.

- D. **Electrical:** The location and identification of major Electrical Service and Electrical Distribution Equipment items are to be shown. Lighting layouts, emergency lighting layouts, receptacle and switch locations, telephone outlets, fire detection and alarm system components, IT/Telecom components, signal and auxiliary system device locations for typical areas are to be shown. Space requirements for Electrical Equipment shall be established, including adequate recessing depth and adequate working clearances for panels, lighting fixtures, etc. Routing of bus duct, major conduit runs, etc. must be shown. The Professional must coordinate with other design disciplines to establish electrical equipment spaces and clearances.
- E. **HazMat, Fire Suppression and other Special Contracts:** Drawings for work separated from the four (4) basic prime contracts (General Construction, HVAC, Plumbing and Electrical), shall follow the general guidelines found in A. through D. above.

501.6 SCHEMATIC AND/OR RISER DIAGRAMS. HVAC and plumbing drawings shall include schematic and/or riser diagrams showing all major pieces of equipment, piping, ductwork, pressure reducing stations, main sprinkler control valves, etc. with capacities and sizes listed for each item. Electrical drawings shall contain schematic and/or riser diagrams, showing all major power system components, main telephone cabinets, major components of signal and auxiliary systems. Electrical power riser components shall be identified by size, over-current rating, interrupting capacity, etc. based on estimated loads. Preliminary riser diagrams should be the base drawing for the expanded riser diagrams which will be required for the construction drawings. Statements justifying the selection of the proposed system(s) must be provided, if different from the approved Schematic Design submission.

501.7 PROJECT MANUAL. Include first draft of the Project Manual. Division 1 Specifications and first draft of all Technical Sections for all Prime Contracts. First draft of the Technical Specifications should indicate the construction materials to be used. Chapter 9 has detailed information regarding the specification and Project Manual format. The following notes apply to the first draft Project Manual:

- A. Include a Project Manual Cover Page, a complete Table of Contents listing all Divisions and Sections.
- B. Include a draft of all applicable Division 01 sections, edited for the Project. See Chapter 9 for details.
- C. **Technical Specifications:** It is important for this submission to have the technical specification sections Part 2 product information sufficiently edited to provide an understanding of the intended products, equipment and materials being proposed for the Project. Include supplemental information, back-up material and data if necessary to describe the materials and equipment proposed.

501.8 PROBABLE CONSTRUCTION COST. The Professional shall provide an updated statement of Probable Construction Cost, with Summary Sheets (one for each Base Bid) using Exhibits B5 and B6 (included in e-Builder) and each from must be signed by the Professional. The estimate must include all known items of work, including site work, demolition, and hazmat remediation, building construction/renovations, and is to be based on current costs. An escalation factor will then be added to the entry for each contract and to the total, projected to mid-point of construction to provide a Total Construction Cost. All Base Bids must be acceptable to the Client Agency, and approved by the Department.

- A. Along with the Probable Construction Cost Summary Sheets, the Professional must submit completed copies of applicable BOPC Project Information forms. The Professional may be permitted to use a different, but similar, format to the Department's prescribed cost estimate forms, if first approved by the Department.

- B. A minimum of three (3) Base Bids within the Base Construction Amount (BCA) will be required, unless otherwise approved by the Design Manager. Base Bids must be additive and ascending. Base Bid No. 1 shall be approximately 90% of the BCA, but not more than 95% of the BCA. A Base Bid No. 4 may be permitted, if approved by the Design Manager, but shall not exceed 105% of the Base Construction Amount. If the Professional's statements of Probable Construction Cost for three (3) Base Bids do not conform to the requirements detailed above, the Submission will be rejected, the Professional may be required to adjust the design, at no additional expense to the Department, to bring the Base Bids within the Base Construction Amount. Alternates are not used by DGS.

SECTION 502 - REGULATORY APPROVALS AND PERMITS

502.1 REQUIREMENTS. The Design Development Submission is to include a list of Regulatory Approvals/Permits. Use Exhibit F3, List of Regulatory Approvals/Permits – Status Report, included in e-Builder. It shall give the current status of all required approvals and permits, with real and anticipated dates. Copies of all approvals and permits obtained to date and a list of all reviewing agency comments must be included. At least the following must be obtained prior to the Design Development Submission.

See PPM Addendum, June 9, 2017, Item 4 for changes to Paragraph 502.1.

- A. Local Zoning, Final Land Development, and other required approvals.
- B. PHMC, Bureau of Historical Preservation Review and Recommendation for projects with archaeological and historical significance, including sites.
- C. All other Federal, State, and Local preliminary approvals, as applicable.

502.2 DEPARTMENT NOTIFICATION. The Professional must immediately notify the BOPC if a regulatory agency requirement substantially increases the cost of the Project, or if any required approvals are withheld by any agency.

502.3 BOILER AND INCINERATOR APPROVAL. If required, the Professional must obtain preliminary approval of boiler and incinerator equipment design from the Department of Environmental Protection, Air Quality Management Section, Water Quality Section, and Waste Management Section, and file the associated application for construction.

502.4 MISCELLANEOUS PERMITS AND APPROVALS. No attempt has been made to list all permits and approvals, which are required and must be obtained.

SECTION 503 - UTILITY SERVICES

503.1 REQUIREMENTS. Building design will continue based on the Schematic Design approval. As part of Schematic Design approval, the location of any new building or building addition shall be finalized on the site. During Design Development, the Professional should have a clear understanding of utility service requirements for the project. The Professional should initiate contact to coordinate service installation with each utility company. The Professional should provide a site plan to each utility company showing building location. The Professional should schedule a site visit with each utility company. Final planning with each utility includes: service requirements (electric = amps, volts, phase / water = gals per hour / natural gas = btu demand / sewage = gal per day), identify demarcation points, delineate service laterals to the building, meter locations, scope of utility company work to extend service to the building, scope of utility work required by DGS contractors, project schedule, and each utility company cost. As part of Design Development, the Professional must verify that each utility company can deliver the service requested. Where a utility service will be taken from a campus or institution system owned by the Client Agency, the Client Agency will determine adequacy and point of connection. The Professional shall also have all on-site utility (i.e. – domestic water wells, on-lot sanitary, solar, geothermal wells, etc.) testing performed and confirm that they will meet the needs of the project. The results of the on-site utility testing are to be included in the Design Development Submission. The Professional shall still complete all regulatory forms required and if none are required they shall notify the Utility Company of the new load being added. Where off-site utilities are required, the Professional shall provide sufficient information for DGS Legal to make contact with the utility company for construction of the off-site work under a Utility License or Utility Agreement. Where the utility company's fee and schedule places a large burden on the Contractor and the project construction schedule, the possibility of doing the work directly with the utility

company under a separate phase should also be considered. Refer to Chapter 13 for more information regarding Utility Services.

- A. The Design Development submission package should include a letter from each utility company confirming that service requirements are available and can be installed to serve the project. Each utility company should provide a written estimate for its cost to extend service to the building. The Professional should show the location and routing of each utility service on the final site development plans, assigning utilities to the Prime Contracts in accordance with the Division of Work outlined in Chapter 2, and showing the demarcation point between work of the Utility Company and work of the Contractor.
- B. When a project includes on-site systems, such as a water well or sewer system, these systems must be designed, tested and proven to be acceptable, before the Design Development Submission can be approved.

503.2 POINT OF DEMARCATION. The point of demarcation where each Utility Company's responsibility to provide service to the facility ends, and the Department's responsibility to continue the service to the Facility begins, is to be established prior to the Design Development Submission.

SECTION 504 – REVIEW, APPROVALS AND POST-CONFERENCE ACTIVITIES

504.1 SUBMISSION REVIEW. The Professional submits the submission by uploading the submission documents to e-Builder. The Design Manager reviews the acceptability of the submission and if found to be apparently acceptable, the Design Manager releases the submission for review by the Client Agency and the Review Team. All reviewer comments and the Professional's responses to the comments are inputted to a template in e-Builder. The Professional must provide an explanation for any review comment that cannot be complied with in the next submission.

504.2 CLIENT AGENCY APPROVAL. The Client Agency's approval must be provided before the Department will approve the Design Development submission. The Client Agency shall issue its approval in e-Builder.

- A. In the case of projects for the Pennsylvania State University, the Professional, as part of its basic services, is to prepare presentation drawings for the University Board, including a black and white perspective sketch, for review and approval. These presentation drawings will be required at some point following the Design Development Submission.

504.3 DGS APPROVAL. Official DGS approval is not given at the Review Conference. Design Development Submission approval, conditional acceptance, or rejection and instructions for further project development are issued by the BOPC through e-Builder, following the Review Conference. All changes required for compliance with codes, regulations, budget constraints and/or enhancement of the design which should have been recommended by the Professional during the developmental stages shall be included as Basic Services provided by the Professional. As per the General Conditions to the Agreement for Professional Services, the Professional shall only invoice up to 90% of the portion of the Professional fee applicable to the Design Development Stage, until the Department approves the submission. Approval of the Design Development Submission by the Design Manager is based on all changes requested or required for further development being incorporated into the design documents.

504.4 MINUTES. The Professional shall furnish minutes of the Design Development Review Conference by uploading to e-Builder, within seven (7) days following the Conference. Professional's post-conference comments, included with the meeting minutes, shall be identified as not a part of the meeting minutes.

504.5 SPECIALTY PERMITS. Following Design Development approval, timely application for specialty permits, such as bathing place permits, food facility/concession approval, sewerage project approvals and water resource and flood control project approvals and associated services, should be undertaken so as not to delay the Construction Documents Submission.

504.6 DESIGN MEETINGS. The Professional shall meet with the Client Agency and the Institution, as frequently as needed, while the Design Development submission is being developed into the final construction

documents. These meetings are to gain the Client Agency's final input into final documents, as the details of the Professional's construction documents are being finalized. Provide meeting minutes as required in Chapter 1.

504.7 CONSTRUCTION REGION COORDINATION. Prior to the Interim Construction Documents Submission, the Professional is to contact the DGS Construction Regional Director and the Client Agency, and if possible meet at the job site. The purpose of the meeting is to address construction administration requirements to be included in the Contract Documents; including facilities for Inspectors, temporary services, parking, and other items of interface with the Bureau of Construction.

504.8 SUBMISSION TO LABOR AND INDUSTRY. For projects where the Interim Construction Documents Submission has been waived by the Special Conditions in the Agreement, the Professional shall determine when the Project documentation is sufficiently completed and ready to be submitted to the Department of Labor and Industry (L&I) for the required code review/approval and issuance of the building permit. However, the submission to L&I shall be made no later than the scheduled date of the Construction Documents Submission to DGS. The Professional should be the applicant on the permit application as an agent of the Department so all correspondence during the review is sent to the Professional.

See PPM Addendum, June 9, 2017, Item 5 for added Paragraph 504.9.

CHAPTER 6

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION

SECTION 600 - GENERAL

600.1 PURPOSE. The Interim Construction Documents Submission should be developed to show that at least seventy-five percent (75%) of the Construction Documents Submission is complete, as determined by the Department. Upon receipt of written approval of the Design Development Submission, the Professional shall make all corrections called for by such approval, and/or required in the Professional's judgment, and shall proceed with the Interim Construction Documents Submission. The Interim Construction Documents shall describe the Project and its design, including all components, materials and finishes, fixtures and equipment, civil, structural, HVAC, plumbing and electrical systems, and all related work, in sufficient detail to permit quantity takeoff to prepare an estimate of construction cost.

600.2 SUBMISSION TO THE BUREAU OF PRE-CONSTRUCTION. The Interim Construction Documents submission is to be delivered to the BOPC on or before the date established in the milestone schedule, unless another date has been approved by DGS. Delivery shall be made by uploading the required submission documents into e-Builder.

Note: The DGS Modernization process and the use of e-Builder process management software may require revisions to the instructions to the Professional regarding Design Submissions to DGS and to the Client Agencies.

600.3 SUBMISSION TO CLIENT AGENCY. Design Submissions will be made through e-Builder. Upon DGS acceptance of the Submission, the Design Manager will release the submission documents for review by the Client Agency.

600.4 ENGINEERING PROJECTS. The requirements for engineering projects like dams and State Parks may differ from building projects, and their design submission instructions will be given to the Professional at the Orientation Conference.

600.5 REVIEW CONFERENCE. A conference to review the Interim Construction Documents Submission with the Professional, the Client Agency, the Institution, and the BOPC will be scheduled in the BOPC's Harrisburg Office approximately two (2) to three (3) weeks after receipt of the submission. The Professional and its Consultants are required to attend the Conference. The option of video conferencing or conducting the review conference at the project site is at the discretion of the Design Manager. The CM and CA will also attend, as applicable.

600.6 CONSTRUCTION MANAGER (CM) AND COMMISSIONING AGENT (CA). When the Department has engaged a Construction Manager or a Commissioning Agent, the Design Manager will, upon DGS acceptance of the Submission, release the submission documents for review by the Construction Manager and/or Commissioning Agent.

SECTION 601 - INTERIM CONSTRUCTION DOCUMENTS SUBMISSION DOCUMENTS

601.1 INTERIM CONSTRUCTION DOCUMENTS SUBMISSION PACKAGE. On the scheduled date of the Interim Construction Documents Submission, the Professional shall deliver the Submission Package to the Bureau of Pre-Construction, including the following documents:

- A. The Interim Construction Documents Submission Probable Construction Cost Summary (for each Base Bid), with complete cost estimate breakdown for each additional Base Bid, and Project Information sheets. For blank forms see Exhibit B7, Interim Construction Documents Submission – Probable Construction Cost Summary and Exhibit B8, Interim Construction Documents Submission – Project Information, included in e-Builder.

- B. The Project Manual (provided as one single PDF document), including Cover Page, Table of Contents, all required Division 01 sections (fully edited), and all technical specifications edited to be specific for the requirements of this project.
- C. All Interim Construction Documents Drawings (provided as one single PDF document), including the Cover Sheet. See Chapter 8 for the drawing format.
- D. The List of Regulatory Approvals/Permits – Status Report (See Exhibit F3, List of Regulatory Approvals/Permits – Status Report, included in e-Builder), indicating the status of the submission/review/approval process for all required permits and approvals, with copies of all approvals/permits obtained to date. Include actual and anticipated application/submission dates, resubmission dates, and final approval/permit dates. Completed applications for regulatory approvals/permits must be submitted to appropriate agencies with copies to DGS per the schedule established by the Professional but not less than thirty (30) days prior to Construction Documents Submission. In addition, copies of all permit application packages submitted during this design period shall be included with the submission.
- E. Meeting minutes from the Professional's meeting with Construction Regional Director, indicating the requirements to be included in the General Requirements Section 010400 – Coordination and Control, and Section 015000 – Temporary Utilities, as well as the Construction Schedule Bar Chart (with temporary heat days).
- F. An updated Overall Project Schedule, from commencement of Design through Construction
- G. A Report on the Status of LEED Efforts for the Project. Describe LEED goals, and the planned approach to accomplishing those goals. Include a LEED Scorecard indicating the points to be obtained, and a supporting narrative describing how those points will be obtained.
- H. A Report on Current and Anticipated Additional Services, including but not limited to, Property Survey, Geotechnical Investigation, Hazardous Materials Survey, LEED Related Activities, etc.
- I. Additional Items, where applicable:
 - 1. The final project report for flood control and/or water resources projects, if changed.
 - 2. The final report of water supply facilities, if changed.
 - 3. The final report on sewerage facilities, if changed.
 - 4. Other additional items requested by the Design Manager, or otherwise determined by the Professional to be required for the Project.

601.2 PROJECT MANUAL. The Professional must submit an updated draft of the complete Project Manual, including Cover Page, Table of Contents, Division 01 – General Requirements, and technical specifications of all contracts. See Chapter 9 for guidelines. Division 01 – General Requirements sections must be complete and fully edited.

601.3 DRAWINGS. Interim Construction Document drawings are to be developed to the level of at least 75% completion of the drawing requirements, as described in Chapter 7.

601.4 PROBABLE CONSTRUCTION COST. The Professional shall provide an updated statement of Probable Construction Cost, with Summary Sheets (one for each Base Bid) using Exhibits B7 and B8 (included in e-Builder) and each form must be signed by the Professional. The breakdown of estimated construction costs shall be computed at current costs. Cost estimates for each of the separate prime contracts shall be sufficiently itemized, with material and labor unit costs, so that a clear understanding of costs is shown. An escalation factor will then be added to the entry for each contract and to the total, projected to the mid-point of construction to provide a Total Construction Cost. All Base Bids must be acceptable to the Client Agency, and approved by the Department.

- A. Along with the Probable Construction Cost Summary Sheets, the Professional must submit completed copies of applicable BOPC Project Information forms. The Professional may be

permitted to use a different, but similar, format to the Department's prescribed cost estimate forms, if first approved by the Department.

- B. A minimum of three (3) Base Bids within the Base Construction Amount (BCA) will be required, unless otherwise approved by the Design Manager. Base Bids must be additive and ascending. Base Bid No. 1 shall be approximately 90% of the BCA, but not more than 95% of the BCA. A Base Bid No. 4 may be permitted, if approved by the Design Manager, but shall not exceed 105% of the Base Construction Amount. If the Professional's statements of Probable Construction Cost for three (3) Base Bids do not conform to the requirements detailed above, the Submission will be rejected, and the Professional may be required to adjust the design, at no additional expense to the Department, to bring the Base Bids within the Base Construction Amount. Alternates are not used by DGS.
- C. If the Professional's estimate of probable cost differs significantly from the opinion of the Construction Manager (where applicable), the Professional must meet with the CM and attempt to reconcile the differences. If the differences cannot be reconciled, a fourth Base Bid may be provided to reflect the CM's opinion.

SECTION 602 - REGULATORY APPROVALS AND PERMITS

602.1 SUBMISSION REQUIREMENTS. The Interim Construction Documents Submission shall include a List of Regulatory Approvals/Permits. Use Exhibit F3, List of Regulatory Approvals/Permits – Status Report, included in e-Builder. The report shall indicate the status of the submission/review/approval process for all required permits and approvals updated from the Design Development Submission. If a regulatory agency requirement substantially increases the cost of the Project, or if any required approvals are withheld by any agency, the Professional must immediately notify the Design Manager.

SECTION 603 – REVIEW, APPROVALS AND POST-CONFERENCE ACTIVITIES

603.1 SUBMISSION REVIEW. The Professional submits the submission by uploading the submission documents to e-Builder. The Design Manager reviews the acceptability of the submission and if found to be apparently acceptable, the Design Manager releases the submission for review by the Client Agency and the Review Team. All reviewer comments and the Professional's responses to the comments are inputted to a template in e-Builder. The Professional must provide an explanation for any review comment that cannot be complied with in the next submission.

603.2 CLIENT AGENCY APPROVAL. The Client Agency's approval must be provided before the Department will approve the Interim Construction Documents submission. The Client Agency shall issue its Approval in e-Builder.

603.3 DGS APPROVAL. Official DGS approval is not given at the Review Conference. Interim Construction Documents submission approval, conditional acceptance, or rejection and instructions for further project development are issued by the BOPC through e-Builder, following the Review Conference. All changes required for compliance with codes, regulations, budget constraints and/or enhancement of the design which should have been recommended by the Professional during the developmental stages shall be included as Basic Services provided by the Professional. As per the General Conditions to the Agreement for Professional Services, the Professional shall only invoice up to 90% of the portion of the Professional fee applicable to the Interim Construction Documents Stage, until the Department approves the submission. Approval of the Interim Construction Documents Submission by the Design Manager is based on all changes requested or required for further development being incorporated into the design documents.

603.4 MINUTES. The Professional shall furnish minutes of the Interim Construction Documents Review Conference by uploading to e-Builder, within seven (7) days following the conference. Professional's post-conference comments, included with the meeting minutes, shall be identified as not a part of the meeting minutes.

603.5 DESIGN MEETINGS. The Professional shall meet with the Client Agency, as frequently as needed, while the Interim Construction Documents submission is being developed into the final construction documents.

These meetings are to gain the Client Agency's final input into final documents, as the detail of the Professional's construction documents are taking final form. Provide meeting minutes as required in Chapter 1.

603.6 SUBMISSION TO LABOR AND INDUSTRY. The Professional shall determine when the Project documentation is sufficiently completed and ready to be submitted to the Dept. of Labor and Industry for the required code review/approval and issuance of the building permit. However, the submission to L&I shall be made no later than the scheduled date of the Construction Documents Submission to DGS. The Professional should be the applicant on the permit application as an agent of the Department so all correspondence during the review is sent to the Professional.

CHAPTER 7

CONSTRUCTION DOCUMENTS SUBMISSION

SECTION 700 - GENERAL

700.1 PURPOSE. The Construction Documents Submission purpose is to provide a 100% complete set of final construction documents including Drawings and Project Manual as required for bidding and construction. Upon receipt of written approval of the Interim Construction Documents Submission, the Professional shall make all corrections called for by such approval, and/or required in the Professional's judgment.

700.2 SUBMISSION TO THE BUREAU OF PRE-CONSTRUCTION. The Construction Documents Submission is to be uploaded to the BOPC on or before the date established in the milestone schedule, unless another date has been approved by DGS. Delivery shall be made by uploading the required submission documents into e-Builder.

Note: The DGS Modernization process and the use of e-Builder process management software may require revisions to the instructions to the Professional regarding Design Submissions to DGS and to the Client Agencies.

700.3 SUBMISSION TO CLIENT AGENCY. Design Submissions will be made through e-Builder. Upon DGS acceptance of the Submission, the Design Manager will release the submission documents for review by the Client Agency.

700.4 ENGINEERING PROJECTS. The requirements for engineering projects like dams and State Parks may differ from building projects, and their design submission instructions will be given to the Professional at the Orientation Conference.

700.5 UCC APPLICATION FOR BUILDING PERMIT. The Professional shall determine when the Construction Documents are adequate for building permit purposes and will submit all the Construction Documents to the Department of Labor and Industry, with completed UCC Application for Building Permit. Commonwealth projects are exempted from UCC Building Permit Application fees.

700.6 REVIEW CONFERENCE. A conference to review the Construction Documents Submission with the Professional, the Client Agency, the Institution, and the BOPC will be scheduled in the BOPC's Harrisburg Office approximately two (2) to three (3) weeks after receipt of the submission. The option of video conferencing or conducting the review conference at the project site is at the discretion of the Design Manager. The Professional and its Consultants are required to attend the Conference. The CM and CA will also attend, as applicable.

700.7 CONSTRUCTION MANAGER (CM) AND COMMISSIONING AGENT (CA). When the Department has engaged a Construction Manager and/or a Commissioning Agent, the Design Manager will, upon DGS acceptance of the Submission, release the submission documents for review by the Construction Manager and/or Commissioning Agent.

SECTION 701 - CONSTRUCTION DOCUMENTS SUBMISSION DOCUMENTS

701.1 CONSTRUCTION DOCUMENTS SUBMISSION PACKAGE. On the scheduled date of the Construction Documents Submission, the Professional shall deliver the Submission Package to the Bureau of Pre-Construction, including the following documents:

- A. The Code Review and Analysis, if changed.
- B. The Construction Documents Submission Probable Construction Cost Summary for each Base Bid, with complete cost estimate breakdown for each additional Base Bid, and Project Information sheets. For blank forms see Exhibit B9, Construction Documents Submission – Probable Construction Cost Summary and Exhibit B10, Construction Documents Submission – Project Information, included in e-Builder.

- C. The Project Manual (provided as one single PDF document), with the Professional's seal and signature on the Cover Page.
- D. All Construction Drawings, including the Cover Sheet (provided as one single PDF document), with the Professional's and Consultants' seals and signatures on all drawing sheets, as appropriate. See Chapter 8 for the drawing format.
- E. A Report Summarizing the Status of all Utilities required for the Project (Electric, Gas, Water, Sewer, Telephone, Cable TV, etc., as applicable). If applicable, provide a written estimate for the Utility Company's cost to extend service to the building. The report shall indicate the nominal capacity of each service and confirm that each service is adequately sized to serve the Project. The report shall indicate what documents were provided for the DGS Legal to prepare easement agreements and the dates the documents were provided. The report shall also detail what actions are required to obtain services, when the actions are required, and who is to take the necessary actions. Refer to Chapter 13 for Utility Requirements. Include a completed copy of Exhibit F4, List of Utility Approvals.
- F. The List of Regulatory Approvals/Permits – Status Report (See Exhibit F3, List of Regulatory Approvals/Permits – Status Report, included in e-Builder), indicating the status of the submission/review/approval process for all required permits and approvals, with copies of all approvals/permits obtained to date. Completed applications for regulatory approvals/ permits must be submitted to appropriate agencies with copies to DGS at least thirty (30) days prior to Construction Documents Submission. In addition, copies of all permit application packages submitted during this design period shall be included with the submission.
- G. Meeting minutes from Professional's meeting with Construction Regional Director, indicating the requirements to be included in the Division 1 - General Requirements Section 010400 – Coordination and Control, and Section 015000 – Temporary Utilities, as well as the Construction Schedule Bar Chart (with temporary heat days). (If not previously submitted)
- H. All previously-submitted Geotechnical Reports, and all other reports, if changed or revised.
- I. A Letter from the Professional, confirming that the Project design is in compliance with the Geotechnical Consultant's recommendations.
- J. Final Engineering Calculations for Potable Water, Sewage Flow, Structural, HVAC, Plumbing, Fire Protection, and Electrical computations (each provided as separate PDF files).
- K. A Construction Schedule Bar Chart schedule of the envisioned construction sequence (See Exhibit F2, Construction Sequence Chart, included in e-Builder). This sheet shall indicate the significant construction activities and milestones (including long lead equipment times, etc.), and shall also indicate the recommended number of calendar days of construction time and the number of calendar days for temporary heat. When a Construction Manager is involved, the Professional shall coordinate the submitted schedule with the CM.
- L. Copies of the proposed RFPs for all Construction Stage Quality Assurance Services (including Structural, Geotechnical, Hazmat, Special Inspections and Testing and Construction Monitoring), as applicable (each provided as separate PDF files).
- M. A professional color rendering of the Project, as a high-resolution digital picture file, in PDF format.
- N. A Report on the Status of LEED Efforts for the Project. Describe LEED goals, and the planned approach to accomplishing those goals. Include a LEED Scorecard indicating the points to be obtained, and a supporting narrative describing how those points will be obtained.
- O. Land Title/Lease Confirmation Drawing: This drawing is the final version of the Overall Site Plan described in Section 501.2.B that is a common drawing to all construction contracts. Provide a

separate electronic file for purposes of Land Title/Lease Confirmation by DGS Bureau of Real Estate.

- P. Submittals Register containing a listing of all submittals identified in the Project Manual. File type to be coordinated with e-Builder for upload for construction.
- Q. Scanned PDF copies of all existing drawings and other documents obtained from the Client Agency, the Institution and/or DGS, used for design by the Professional.
- R. Additional Items, where applicable:
 1. The final project report for flood control and/or water resources projects, if changed.
 2. The final report of water supply facilities, if changed.
 3. The final report on sewerage facilities, if changed.
 4. Other additional items requested by the Design Manager, or otherwise determined by the Professional to be required for the Project.

701.2 PROJECT MANUAL. The Professional must submit the 100% complete Project Manual, including Cover Page, Table of Contents, Division 01 – General Requirements, and technical specifications of all contracts, describing the type, quality and use of materials, equipment, processes and systems to be incorporated in the work. The specifications must be consistent with the drawings, and coordinated among trades and between prime contracts. See Chapter 9 for guidelines.

All sections must be complete and fully edited. The Cover Page must bear the Professional's Seal and Signature.

- A. Submittals Register: The Professional must prepare and submit a listing of all submittals identified in the Project Manual including but not limited to shop drawings, material data, samples and product data. Include all items the Professional is required to review to verify the correct products and equipment will be provided by the construction contractors. Prepare the Submittal Register as a separate document for the Construction Document submission. The final Submittals Register is to be uploaded to e-Builder by the Professional no later than Notice of Award to the Contractors.

701.3 DRAWINGS. Construction drawings are to be 100% complete dimensioned plans, elevations, sections, details, schedules and diagrams of all architectural, landscaping, civil, environmental, structural, HVAC, plumbing, electrical, and other miscellaneous contract work. All information requisite to accurate bidding and construction must be included. See Chapter 8 for more information. The Professional's seal and signature must appear on the Cover Sheet. The Professional's or the respective Consultants' seal and signature must also appear on all drawing sheets of the specific discipline for which they held design responsibility.

- A. All approvals from various regulatory agencies shall be noted on Cover Sheet of the drawing set.

701.4 ENGINEERING ANALYSIS AND COMPUTATIONS. The Professional must provide complete and orderly civil, structural, HVAC, plumbing (with fire protection), and electrical engineering analysis and computations. Clearly indicate all engineering processes used to develop and size all members, connections, equipment and systems. All design criteria with sketches and text to clarify analysis, assumptions and safety factors used must be included. See Chapter 10 for Standard Design Practices. Note: Comments provided by DGS, or the lack of comments, does not relieve the Professional of responsibility for his calculations. The following guidelines are to be used:

- A. The project number and title are to be included on each sheet.
- B. The name of the firm and engineers who prepared the computation/analysis is to be included.
- C. The date is to be included.
- D. Computations of each prime contract are to be provided as separate PDF document files.
- E. A table of contents, number pages and references to drawings and schedules is to be included.

701.5 PROBABLE CONSTRUCTION COST. The Professional shall provide an updated statement of Probable Construction Cost, with Summary Sheets (one for each Base Bid) using Exhibits B9 and B10 (included in e-Builder) and each form must be signed by the Professional. The breakdown of estimated construction costs shall be computed at current costs. Cost estimates for each of the separate prime contracts shall be sufficiently itemized, with material and labor unit costs, so that a clear understanding of costs is shown. An escalation factor will then be added to the entry for each contract and to the total, projected to the mid-point of construction to provide a Total Construction Cost. All Base Bids must be acceptable to the Client Agency, and approved by the Department.

- A. Along with the Probable Construction Cost Summary Sheets, the Professional must submit completed copies of applicable BOPC Project Information forms. The Professional may be permitted to use a different, but similar, format to the Department's prescribed cost estimate forms, if first approved by the Department.
- B. A minimum of three (3) Base Bids within the Base Construction Amount (BCA) will be required, unless otherwise approved by the Design Manager. Base Bids must be additive and ascending. Base Bid 1 should be approximately 90% of the Base Construction Amount but not more than 95% of the Base Construction Amount. Only upon approval of the Director may Base Bid 3 exceed the Base Construction Amount. A Base Bid No. 4 may be permitted, if approved by the Design Manager, but shall not exceed 105% of the Base Construction Amount. If the Professional's statements of Probable Construction Cost for three (3) Base Bids do not conform to the requirements detailed above, the Submission will be rejected, and the Professional may be required to adjust the design, at no additional expense to the Department, to bring the Base Bids within the Base Construction Amount. Alternates are not used by DGS.
- C. If the Professional's estimate of probable cost differs significantly from the opinion of the Construction Manager (where applicable), the Professional must meet with the CM and attempt to reconcile the differences. If the differences cannot be reconciled, a fourth Base Bid may be provided to reflect the CM's opinion.

701.6 PRE-BID CONFERENCE. As part of the Construction Documents Submission the Professional shall provide a recommendation regarding the need for, or appropriateness of a Pre-Bid Conference. Attendance at the Pre-Bid Conference is not mandatory for bidders, and bidders are not required to visit the site, so it is critically important the Bidding/Construction Documents stand alone.

701.7 PROFESSIONAL RENDERING. Unless the requirement is waived by the Department, a rendering is required on all new building, building addition, and building renovation projects. As a component of the Construction Documents Submission, the Professional shall provide a high-resolution digital picture file of the rendering in PDF format. The following requirements apply to all renderings.

- A. The rendering may be hand-drawn or electronic, but must be produced by an independent professional rendering artist. (Note: If the Professional wishes to produce the rendering using his own staff, samples must be provided to the Design Manager for his approval).
- B. If a hard-copy framed rendering is requested as an Additional Service, the choices of artistic medium, mat color, and frame for the rendering are the option of the Professional.
- C. The rendering shall contain appropriate landscaping, human figures, vehicles, etc., to establish a feeling of life and scale.
- D. Professional shall provide a proof or sketch of the proposed rendering, to the Design Manager for approval of the view-angle before proceeding with the final rendering.
- E. The rendering shall incorporate a label identifying the DGS Project Number, the Project Name, the Project Location, the 'Department of General Services', the date, and the Professional's firm name.

Note: A framed hard copy rendering is not required, unless specifically requested by the Department. If requested, the rendering shall meet all the requirements listed above, and shall be appropriately matted, fully framed, and protected with scratch resistant, plastic glazing. Appropriate size of the hard-copy

rendering will vary depending upon the facility's configuration, but generally the size of the actual rendered area within the mat opening should be approximately 350 to 450 square inches. When requested, the hard-copy framed rendering will be considered an Additional Service.

701.8 REQUESTS FOR PROPOSALS FOR QUALITY ASSURANCE SERVICES. Provide copies of the proposed RFP for all Construction Stage Quality Assurance Testing and Inspection Services for Department's review and approval. Include RFPs for Geotechnical, Structural, and Hazmat QA services, as applicable. The RFP shall include a complete description of the scope of the QA Services to be required for the Construction Stage of the Project. Refer to Chapter 13 and the Exhibits included in e-Builder.

701.9 COAL-FIRED SYSTEMS. On projects employing coal-fired boilers and/or incinerators, submit a PDF file of the approved DEP application to DGS.

SECTION 702 - REGULATORY APPROVALS AND PERMITS

702.1 CONSTRUCTION/BUILDING PERMITS. Prior to the Construction Documents Submission, the Professional shall make application for and obtain all state, county and municipal regulatory approvals/permits required for the construction of the Project.

- A. Upon completion of the Construction Documents, but no later than the Construction Documents Submission to DGS, the Professional shall submit the Project to the Department of Labor and Industry for review, in order to obtain L&I UCC Approval and Building Permit. The Professional should be the applicant on the permit application as an agent of the Department so all correspondence during the review is sent to the Professional.
- B. The Professional shall contact the municipality to identify any permits, licenses and/or certificates that may be required to be obtained by the Contractors during the Construction Stage, for proper execution and completion of its work. The Professional shall identify these in Section 010400 – Coordination and Control.

702.2 SUBMISSION REQUIREMENTS. The Construction Documents Submission shall include a List of Regulatory Approval/Permits updated from the Design Development or the Interim Construction Documents Submissions to give current status of all required approvals and permits. Use Exhibit F3, List of Regulatory Approvals/Permits – Status Report, included in e-Builder. Indicate real and anticipated dates for Applications, Comments Returned, Resubmission with Comments Addressed, and Final Approval. Copies of all approvals and permits obtained, and all applications submitted, that were not previously furnished must be included.

702.3 DEPARTMENT NOTIFICATION. If a regulatory agency requirement substantially increases the cost of the Project, or if any required approvals are withheld by any agency, the Professional must immediately notify the Department.

SECTION 703 – UTILITY SERVICES

703.1 REQUIREMENTS. During the Construction Documents stage, the Professional continues coordination with each utility company for service installation at the proper time. Service arrangements must be completed prior to final submission so bidding will not be delayed. Early in the Construction Documents Stage, the Professional shall contact each utility company and obtain, in writing, a final scope of work for service installation, routing plan (includes right-of-way requirements), meter location, and the utility's cost to install its service. The Professional should forward this information along with the utility company point of contact to the Design Manager for initiation of a utility agreement(s). The necessary drawings for DGS Legal to prepare license/easement documents shall be included.

- A. The Professional must follow the service requirements of each utility company described in its scope of work. The Professional shall show all service work required by DGS contractors on the contract documents, as well as work provided by the utility company.
- B. Construction Documents shall include any terms and conditions that the Construction Contractor must coordinate, including costs to be paid to the utilities that are not incorporated in a Utility Agreement(s). Where the costs that the Contractor is to pay are estimated, the difference between

actual costs and what is provided in the Construction Documents will be adjusted by Change Order, in accordance with the General Conditions.

SECTION 704 – REVIEW, APPROVALS AND POST-CONFERENCE ACTIVITIES

704.1 SUBMISSION REVIEW. The Professional uploads the submission to e-Builder. The Design Manager reviews the acceptability of the submission and if found to be apparently acceptable, the Design Manager releases the submission for review by the Client Agency and the Review Team. All reviewer comments and the Professional's responses to the comments are inputted to a template in e-Builder. The Professional must provide an explanation for any review comment that cannot be complied with in the final documents.

704.2 CLIENT AGENCY APPROVAL. The Professional should be certain that the Construction Documents have the 'informal' approval of the Client Agency, before uploading the Construction Documents Submission to the Department. The Client Agency shall issue its final approval in e-Builder.

704.3 DGS APPROVAL. Official approval is not given at the Review Conference. Construction Documents Submission approval, conditional acceptance, or rejection is issued by the Design Manager through e-Builder, following the Review Conference. All changes required for compliance with codes, regulations, budget constraints and/or enhancement of the design which should have been recommended by the Professional during the developmental stages shall be included as Basic Services provided by the Professional. Approval of the Construction Documents Submission by DGS is contingent on all changes requested or required being incorporated into the Construction Documents. As per the General Conditions to the Agreement for Professional Services, the Professional shall only invoice up to 90% of the portion of the Professional fee applicable to the Construction Documents Stage.

Note: The Construction Document Submission will not be approved and released for bidding until all permits, approvals, agreements, etc. are provided and uploaded to the Project files in e-Builder. Once all documents are confirmed to be received, the Design Manager will approve the submission. The pre-bidding checking process followed by the Design Manager to determine the approval status is discussed in Section 705.

704.4 MINUTES. The Professional shall furnish minutes of the Construction Documents Review Conference by uploading to e-Builder, within seven (7) days following the conference. Professional's post-conference comments, included with the meeting minutes, shall be identified as not a part of the meeting minutes.

SECTION 705 – PRE-BIDDING CHECK

705.1 PURPOSE. After the Construction Documents Submission review conference, the project must be checked by the Design Manager, before it can be approved and sent to the Bidding Support and Contract Award Division to begin the Procurement process. Proper checking ensures that all DGS, regulatory agency, utility service, and other requirements are met, to avoid interruption and delays in the bidding and construction process.

705.2 PREPARING FOR PRE-BIDDING CHECK. The Professional is responsible for its own quality control, to make sure that the documentation provided for bidding and construction is complete and meets the Professional firm's own standards of quality.

- A. Before the bidding process can begin, the Design Manager will provide the Professional with a Release for Bidding Checklist (Exhibit C6 included in e-Builder). The checklist includes all items required to be completed or obtained before the project can be released for bidding. The Professional reviews the list and once all items are completed and submitted, the Professional must sign and upload the checklist to e-Builder.
- B. When preparing the Bidding Documents prior to releasing for bidding, the Professional must perform a quality control check of the documents to confirm that the entire Project Manual (Division 1, all technical specification sections and any appendices) is assembled into a single PDF file, and similarly the entire set of Drawings is assembled into a single PDF file, and must:

1. Verify that all information on the Project Manual Cover Page is correct, and that the Cover Page is properly sealed and signed.
2. Verify that all sections and pages listed in the Table of Contents are included, and that all sections and pages are included in the correct order. (Note: The non-technical front end documents like the Notice to Bidders, Instructions to Bidders, Contract, etc. will not be included in the Professional's Project Manual PDF file but uploaded to the Project's e-Builder's bidding folder by the BOPC Bidding Support and Contract Award Division.)
3. Verify that the Base Bid Descriptions in Section 010300 are formatted correctly in additive and ascending order, and that they are as approved by the Client Agency.
4. Verify that all information on the Drawing Set Cover Sheet is correct, and that the Cover Sheet is properly sealed and signed. Verify that all drawings in the set are signed and sealed.
5. Verify that all drawing sheets listed in the Index to Drawings are included, and that all sheets are included in the correct order.

CHAPTER 8

DRAWINGS

SECTION 800 - GENERAL

800.1 PURPOSE. This Chapter presents standards and guidelines for all drawings prepared for DGS projects. Generally accepted professional practices are to be used, except where different DGS standards or practices are given.

800.2 DRAWINGS STANDARDS. These standards and guidelines apply to the construction contract drawings. Drawings for the design review submissions are to follow these same standards. All drawings used for DGS review, bidding and construction shall be submitted in PDF format, by uploading the documents to e-Builder.

800.3 WORKING DRAWINGS. Original drawings shall be AutoCAD-generated drawings. Line and lettering must be dark and large enough for 1/2 size reproduction, should printing be necessary. Lettering must be a minimum 1/8" height. Signatures and code approvals must be electronically applied.

- A. Except where drawings are diagrammatic, all drawings shall be drawn to scale, and shall include a graphic scale to assist others in ensuring that they are printing the drawings at the appropriate scale. On scaled drawing sheets, include the "Verify Scale" box (see Exhibit E4, Standard Sheet Title Block, included in e-Builder) in the lower right of each drawing sheet, just to the left of the Title Block.
- B. All drawings shall be submitted in PDF format. Drawings shall be saved as PDF's directly from the original application (AutoCAD), where possible, at a minimum of 600dpi.

800.4 DRAWINGS DURING CONSTRUCTION. The Professional, when directed by the Department, will furnish from time to time, as the construction work progresses, such supplemental drawings as may be required for further illustrating the details of the work, but these supplemental drawings will not include the shop drawings, all of which are to be prepared by the contractor and submitted as specified for approval before the work is started.

800.5 RECORD DRAWINGS. Record drawings of the construction shall adhere to the industry standard for Record Drawings, and shall be in electronic format, in accordance with the Professional Agreement. See Chapter 12 for additional information.

800.6 INFORMATION. See Chapters 3, 4, 5, 6 and 7 for a description of the information required on the drawings at the various Design Stages. Final bidding/construction drawings shall contain adequate information, including schedules, details and pertinent information necessary to accurately bid and perform the work.

800.7 DRAWING COORDINATION. The Professional must exercise care to ensure that there is thorough coordination of the Construction Document Drawings, between the various contracts and with the Specifications. If a Change Order must be issued due to ambiguity or inconsistency or missing information on the drawings, the Change Order will be deemed to be an error/omission on the part of the Professional, possibly resulting in a monetary assessment against the Professional.

800.8 PROFESSIONAL'S RESPONSIBILITY. It must be understood that the DGS Reviewers do not function as the Professional's "checkers". It is the Professional's responsibility to check and thoroughly examine their Documents prior to each submission to the Department, to ensure that they meet the quality standards of its firm. The Professional must make sure that final Bidding/Construction Documents (including drawings and specifications) form a concise and biddable set of documents. Keep in mind that the Professional's firm may be assessed for Change Orders deemed to be due to errors and omissions in the documentation.

SECTION 801 - SIZE, FORMAT AND APPROVALS

801.1 DRAWING SIZE. Drawings for Design Submissions, as well as for Bidding and Construction shall be in PDF format created to one of the following sizes: 22" x 34", 24" x 36", or 30" x 42". Record Drawings

submissions will include AutoCAD drawings created at 1:1, as well as PDF drawings created to the same size as is used for Design Submissions. Projects for DEP shall be created to 24" x 36" size.

801.2 COVER SHEET. All projects shall have a Cover Sheet, and shall adhere to the standards above and per Exhibit E1, Cover Sheet Layout, included in e-Builder. The Index to Drawings shall list the common drawings to all contracts and then each drawing by contract name and number, sheet number and descriptive title. A separate index sheet may be used if the Drawing Index does not fit on the Cover Sheet. Cover Sheet shall have all pertinent regulatory approval references. List all Consultants, indicating their discipline.

801.3 TITLE BLOCKS. The title blocks for the Cover Sheet and for the individual drawing sheets shall be as shown in the Exhibit E2, Cover Sheet Title Block, and Exhibit E4, Standard Sheet Title Block, Included in e-Builder. The Professional must submit proposed title blocks, with names and titles, to the Design Manager for approval as a component on the drawings at the Schematic Design Submission.

- A. Drawing sheets for Construction Documents Submission must have the "Drawn By" and "Checked By" boxes filled in. The person indicated in the "Checked By" box must be a qualified person, experienced in construction methods and document preparation, and different from the person indicated in the "Drawn By" box.

801.4 PROFESSIONAL SEAL AND SIGNATURE. For the Construction Documents Submission, the Project Manual Cover Page and the drawing set Cover Sheet must bear the Professional Seal and signature of the Design Professional of record. The individual drawing sheets of each particular discipline must bear the Professional Seal of the Registrant in charge of that portion of the work. The Architect's Seal must appear on the architectural drawings, the Engineer's Seal must appear on the engineering drawings, etc. An electronic seal, identical to the actual seal, may be used with the Registrant's signature electronically applied near or across the seal. Seal and signature must appear on all drawing sheets, specifications, plats and reports issued by the Professional. Likewise, all Drawing sheets and the Project Manual for the Bidding and Construction must be sealed and signed. Pennsylvania Registration is required.

801.5 COVER SHEET TITLE BLOCK BOXES. The Professional must include in the appropriate title block boxes a Project Location Map, a Vicinity Map, and Campus/Key Plan on the Cover Sheet, locating the Project site with reference to identifiable landmarks such as adjacent buildings, roads or other references depending on the nature of the Project. The intent is to assist persons to find the project site. Refer to Exhibit E3, Project location Map, included in e-Builder for the Project Location Map.

801.6 FORMAT REQUIREMENTS. In order to meet DGS requirements for Record Drawings required at project closeout, the AutoCAD drawing files shall be prepared using logically named and defined layers, where objects are placed on the appropriate layers. Layers shall be separated by discipline. All referenced drawings, non-standard fonts and line types shall be included with the files. Line weights shall be defined by layer or object. The CAD software and version being used for design shall be identified. For AutoCAD drawings, bind all xref-dependent objects, including non-standard fonts, shape files, and line types, to the final drawings included on the CDs. A standard AutoCAD workstation shall be capable of loading and opening the drawings, without proxies.

801.7 SUBDIVISION/LAND DEVELOPMENT DRAWINGS. Include the Department's standard signature block on the drawings. Refer to Exhibit E6, Subdivision/Land Development Plan Signature Block, included in e-Builder.

SECTION 802 - SHEET DESIGNATIONS AND SEQUENCE

802.1 SHEET DESIGNATIONS. Drawing sheets shall be numbered and identified as follows:

- A. DGS Standards:
 - CS-1 - Cover Sheet
 - G-1, G-2 - Common Drawings to all Contracts (General Information, Overall Site Plan, Code Reviews, Egress Plans, Construction Sequencing Plans etc.)
 - C-1, C-2 - Civil, Site Drawing
 - A-1, A-2 - Architectural Drawings

S-1, S-2	- Structural Drawings
H-1, H-2	- Heating, Ventilating, Air-Conditioning Drawings
P-1, P-2	- Plumbing Drawings
FP-1, FP-2	- Fire Protection Drawings
E-1, E-2	- Electrical Drawings
AHE-1, AHE-2	- Architectural, HVAC, and Electrical Drawings (multi-discipline)

B. Other sheet designations or AIA Standards may be used, with Design Manager's approval.

802.2 DRAWINGS. All work of each Prime Contractor shall be shown on the drawings for that particular contract. All work shown on a particular drawing that is by a different Prime Contractor, shall be identified as such (e.g. "by .2 Contractor", or "by HC", etc.) All drawings serve as reference drawings for all Contractors.

802.3 MULTI-DISCIPLINE DRAWINGS. Drawings showing work of more than one (1) discipline/contract should have a sheet designation indicating all disciplines involved (e.g. HE-1 or HPE-1). If a Drawing is 'multi-discipline' it must be included on the Drawing Lists of all Contracts for which work is indicated. Multi-discipline drawings are to be avoided and shall only be used in exceptional cases, where substantial duplication of drafting can be avoided by their use, and only with the approval of the Design Manager. All notes on multi-discipline drawings must be addressed to specific contractors. When used, the Professional shall indicate Contractor responsibilities by means of a boxed note (shown below), located next to the Title Block.

<p>All work on this Drawing is to be included by the _____ Contractor, except work noted to be by: _____, _____, _____ Contractor.</p>
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802.4 ASSEMBLY. Drawings of all contracts shall be assembled together in the proper order and orientation in one PDF, so that bidders view all the Project Drawings, in order to understand the interface and coordination of the prime contracts. If the drawing set requires more than one volume, all volumes must have the same identical cover sheet.

SECTION 803 - SYMBOLS, REFERENCES AND SCHEDULES

803.1 SYMBOLS. The drawings of each discipline shall include a Legend showing all reference symbols and abbreviations with a clear explanation of each. Symbols utilized in the development of drawings shall be those commonly recognized by Professionals throughout the building industry, as being both identifiable and universal in meaning.

803.2 REFERENCES. Industry-recognized reference standards must be used in the preparation of all Contract Drawings. The Department recognizes reference standards, such as ASHRAE, SMACNA, etc. as the most commonly used reference publications available to the Professional building industry. These reference standards are mentioned because of their universal acceptance. It is not the intention of the Department, however, to limit or restrict the use of other industry recognized standards or reference material in the preparation of the contract drawings.

803.3 SCHEDULES. The Department has no standard format for schedules other than for electrical panelboards (Refer to Exhibit F6, Sample Electrical Panel Schedule, included in e-Builder). It is important to stress, however, that the development of accurate and complete schedules is essential to clear and concise documents. Do not include manufacturers' names or model numbers in the schedule, unless approved by the Department. Show these manufacturers' names and numbers in the appropriate specification sections.

SECTION 804 - MISCELLANEOUS

804.1 BUILDING PLAQUE. The drawing/detail of the DGS standard plaque must be included on the construction drawings, for all new facilities and major alterations and renovations, unless the requirement is

specifically waived by the Department. Refer to Exhibit E5, Standard Plaque Detail, included in e-Builder. Location of actual plaque shall be shown on the Drawings.

804.2 GENERAL NOTES. The drawings of each prime contract shall include General Notes, which include areas of responsibilities and any special conditions or instructions relating to the work of that contract and coordinating the work with other contracts. The General Notes must be tailored to the specific scope of work of the project.

804.3 STRUCTURAL DRAWING REQUIREMENTS. The General Construction Contract drawings shall include Structural Information describing, but not limited to, the following:

- A. Design live loads, wind loads and other applicable loads, and show plan locations of special heavy loading areas.
- B. Strength of structural materials with ASTM designations.
- C. Required bearing capacity of bearing strata.
- D. Required capacity of piles.
- E. Structural design provisions included for future additions and alterations.
- F. AISC type of construction.
- G. Sufficient details to allow construction.
- H. Criteria for removal of shoring and form work.
- I. Requirements for special earthwork.

804.4 HVAC, PLUMBING AND ELECTRICAL DRAWING REQUIREMENTS. The following guidelines are to be used, with accommodation for conditions of specific projects.

- A. Water, Soil, Waste and Vent Piping:
 - 1. 1/4" scale drawing of piping for all toilet rooms and kitchens.
 - 2. Isometric drawing and/or riser diagrams.
 - 3. Identify and number all stacks, rainwater conductors, hot and cold water risers, cleanouts and floor drains.
 - 4. Detail of safe wastes for refrigerator drains, fountain equipment, coffee urns, vending machine, etc.
 - 5. Clearly indicate all pipe sizes.
 - 6. Show location of shock absorbers.
- B. Condensate Drain Piping:
 - 1. Drain line shall be run to a safe waste, slop sink, funnel drain, etc.
 - 2. Detail of connection to drip pan.
 - 3. Riser diagram.
 - 4. Clearly indicate pipe sizes.
- C. Fire Protection:
 - 1. Fire protection systems shall be designed in accordance with the current requirements of the NFPA and National Board of Fire Underwriters.
 - 2. Prepare detailed diagrams or drawings which may be required by the Department.
 - 3. Riser diagram of standpipe system showing valved outlets at each floor.
 - 4. Show location of all fire hose cabinets.

5. Show location of any sprinkler heads that require special attention to layout and location.
 6. Show all fire protection systems in the building.
 7. Clearly indicate location and size of all sprinkler main and risers.
- D. Gas Piping:
1. The entire design of gas piping shall be made in strict accordance with the recommendation of the local gas company and the ASME Code for Pressure Piping ASA B 31.1-1955 and American Standard for Installation of Gas Piping and Gas Appliances in Building ASA 221.30.
 2. Riser diagram.
 3. Clearly indicate location and size of all gas piping.
- E. HVAC, Plumbing, Electrical, and Data Communications Equipment Rooms:
1. Show location and size of all equipment.
 2. Show proper clearances of all equipment, conforming to Department of Labor & Industry, "Regulations for Boilers and Unfired Pressure Vessels".
 3. Exit from equipment rooms shall be large enough to remove all equipment without dismantling.
 4. Proper clearance for tube removal from all equipment.
 5. Proper clearance for electrical equipment in accordance with NEC.
 6. Proper clearance around all equipment for maintenance work.
- F. Roof Plan:
1. Show location of all roof drains (furnished by PC, set and flashed by GC).
 2. Show location of all roof penetrations, curbs, etc.
 3. Show location and size of all rooftop equipment.
- G. Equipment Pads and Structural Supports:
1. Show steel member sizes and details.
 2. Show all dimensions.
 3. Show reinforcing size and pattern.
 4. Method of anchoring equipment.
 5. Vibration eliminators and isolators.
 6. Design to be checked by Structural Engineer.
- H. HVAC Equipment, Ductwork and Piping:
1. Show all items of equipment including anchors and support structures and piping.
 2. Show all ductwork preferably to scale with duct sizes shown and coordinated to avoid interference.
- I. Electrical Equipment:
1. Show proper distribution riser diagrams.
 2. Use DGS standard panelboard schedule. Refer to Exhibit F6, Sample Electrical panel Schedule, included in e-Builder.
- J. Other Systems: Show location of all equipment and devices of other systems including building automation, temperature control, fire alarm, security, data and telecommunication, and lightning protection.

804.5 USE OF LAND DEVELOPMENT DRAWINGS. The Cover Sheet from the Land Development Plan submission shall not be included as Contract Documents. The plan sheets may be used provided they include only the information necessary for the construction documents, as a typical DGS drawing sheet and the DGS title block is used. Text applicable only to the LDP submission, signature blocks, and Professional/Consultant title blocks shall be removed.

804.6 CODE ANALYSIS DRAWINGS. Code analysis drawing sheets shall be common to all Prime Contracts and may include contract requirements that are not shown elsewhere in the Contract Documents.

CHAPTER 9

PROJECT MANUAL

SECTION 900 - GENERAL

900.1 PURPOSE. The purpose of this Chapter is to establish consistency in the submission and formatting of the Project Manual, which consists of the Project Manual Cover Page, Table of Contents, Division 01 - General Requirements, and the Technical Specifications for each contract.

- A. The Professional shall submit the Project Manual by uploading the required documents into e-Builder, as part of the appropriate Design Submission.

900.2 PROGRAMMING SUBMISSION. Specifications are not required with this submission. The Project Information Forms and the Drawings will sufficiently indicate the intent of the design at this stage. See Chapter 3 for more information.

900.3 SCHEMATIC DESIGN SUBMISSION. A draft Project Manual Cover, Table of Contents, and one complete sample technical section are required with this submission. See Chapter 4 for more information.

900.4 DESIGN DEVELOPMENT SUBMISSION. A first draft Project Manual including first draft Division 1 specifications are to be part of the Design Development Submission. It is important for this submission for the technical sections Part 2 product information be sufficiently edited to provide an understanding of the intended products, equipment and materials being proposed for the Project. Refer to Chapter 5 for more information.

900.5 INTERIM CONSTRUCTION DOCUMENTS SUBMISSION. An updated draft of the complete Project Manual must be part of the Interim Construction Documents Submission. Refer to Chapter 6 for more information.

900.6 CONSTRUCTION DOCUMENTS SUBMISSION. Final specifications, assembled as a Project Manual, must be 100% complete, and in accordance with Chapter 7, this Chapter and all other applicable references in this Manual.

SECTION 901 - PROJECT MANUAL FORMAT

901.1 CONSISTENCY. The same specification format and font must be used for all contracts, with specification sections written/provided by all the Professional's Consultants using the same format and font as the Professional. The Table of Contents should be approved during the Design Development Review. See Chapter 5 for more information. The required formats are CSI Master Format™ 2004 Edition or later and CSI Section Format™ 2004 (2nd Printing, December 2009). Any other format must be approved by DGS.

901.2 FORMAT. Project Manual shall comply with the following:

- A. Provide in PDF format, created as 8-1/2" x 11" page size.
- B. All Contracts must be assembled together into a single Project Manual, with one Table of Contents covering all Contracts. If necessary, the Manual may be provided in multiple volumes. Break up the volumes in complete Prime Contract division and include the Cover Page and Table of Contents in each volume.
- C. The footer for documents that apply to all Contracts (Table of Contents through and including Division 01) shall have the project number in the lower left corner ("DGS 406-53 PHASE 1" or "DGS 406-53 PHASE 2 PART 1").
- D. The footer for documents that apply to one specific Contract (the technical specifications) shall have the project number and the contract number in the lower left corner ("DGS 406-53 PHASE 1.1" or "DGS 406-53 PHASE 2 PART 1.2").

- E. All pages shall have the section number followed by the page number in the center of the footer (e.g. 001400-1).
- F. All pages shall have the name of the section shall appear in the lower right corner of the footer.
- G. All paragraphs and subparagraphs must be numbered or lettered in outline form.
- H. The Table of Contents should list all Divisions in numerical order. See Exhibit D2, Table of Contents, included in e-Builder. The Divisions and Sections applicable to each prime construction contract must be defined in the Division 1 Specifications.
- I. Refer to the sample Project Manual Cover, Exhibit D1, included in e-Builder.

SECTION 902 - PROJECT MANUAL DOCUMENTS AND ORDER OF ASSEMBLY

902.1 LIST OF FRONT END DOCUMENTS. The Bidding and Contract Documents Applicable to All Contracts will be automatically uploaded to e-Builder. The documents listed below are to be provided by the Professional:

- A. Project Manual Cover Page
- B. Table of Contents

902.2 DIVISION 01 – GENERAL REQUIREMENTS SECTIONS. The General Requirements sections are standard to all DGS projects, and are generally applicable to all prime contracts, although all sections are not required on all projects. The Professional shall discuss the list of Division 01 sections with the Design Manager to determine which sections are required for each specific project. The Division 01 - General Requirements are available on the DGS website and editable documents are included in e-Builder. Follow these instructions when editing or supplementing Division 1 Sections:

- A. The Professional must carefully examine the General Requirements sections, editing as required for each particular project and adding sections when appropriate to the Project. The basic provisions and wording of the Division 01 Sections reflect DGS policy. These provisions are to be changed only with the Design Manager's approval. Deviation from DGS Policy and Procedures is not acceptable.
- B. Do not repeat or change, in Division 01 Sections, items already addressed in the General Condition of the Construction Contract.
- C. Adding/Deleting Sections: Discuss with the Design Manager before adding additional Sections to Division 01. If additional sections are necessary, take care not to create conflicts with the General Conditions to the Construction Contract. Add Sections to incorporate requirements needed for an individual project that are not covered in the standard Sections. Do not add requirements without verifying that the requirement is not covered in the General Conditions. Do not use Division 01 sections of other published specifications, which may have conflicts with the DGS standard General Conditions to the Construction Contract, Division 01 – General Requirements, and/or Bureau of Construction Administrative Procedures. Delete Sections not applying to the individual Project.
- D. Editing Standard Sections: The Professional must edit the Sections to add, delete or modify provisions to suit the individual Project. Each Section includes notes to the specification writer, generally indicated in bold italicized text within brackets [***bold***]. Remove 'Notes to Specification Writer' as part of the editing process. Do not make changes simply to have the Requirements conform to the Professional's own preferred format or content.
- E. Sections 010400, Coordination and Control and Section 015000, Temporary Utilities: Contact the DGS Construction Regional Director and the Client Agency to discuss and determine items such as:

1. The size of the office space and equipment needed for the DGS Construction Project Manager or if the Client Agency has adequate available space for the DGS Construction Project Manager.
 2. The availability and restrictions on existing utilities that may be available to the construction contractors for temporary use.
- F. Section 010300, Base Bid Descriptions: The following paragraphs explain the Base Bid format used for all projects. Add or deduct Alternates are not used. Instead, a sequential series of Base Bids are used to provide bidding options.
1. The Work of each Base Bid shall be adequately summarized in Section 010300, Base Bid Descriptions, to establish the Scope of Work for each. The Drawings and Specification shall thoroughly describe and detail the changes required by each Base Bid, to the previous Base Bid.
 2. The Professional shall submit a minimum of three (3) Base Bids, additive and ascending in approximately equal value increments, each with its own Statement of Probable Construction Cost. Each Base Bid adds work to the previous Base Bid. All Base Bids must be acceptable to the Client Agency and approved by the Department. Example:
 - ❖ Base Bid No. 1 – Shall include all the work as shown on the Drawings, except work identified to be part of another Base Bid.
 - ❖ Base Bid No. 2 – Same as Base Bid No. 1, except add:
(or if there is no change from the previous Base Bid, use)
 - ❖ Base Bid No. 3 – Same as Base Bid No. 2.
 3. A fourth Base Bid is allowed if prior approval is obtained from the Design Manager.
 4. Base Bids will be sequentially uniform for all contracts, even if the addition of work in a particular Base Bid does not affect a contract. In other words, Base Bid No. 2 shall apply to all contracts; Base Bid No. 3 shall apply to all contracts, and so on. When a contract is not changed by a particular Base Bid, the description for the contract shall state that the work therein shall be the same as the previous Base Bid description.
 5. The Department will prepare the Proposal Form. The form will not describe the work of the various Base Bids, but will make reference to Section 010300, Base Bid Descriptions of the Division 01 - General Requirements.
- G. On projects for which the Client Agencies have special requirements, include the appropriate Client Agency generated Supplemental Provisions sections in Division 01, General Requirements.
- H. Some provisions included in other pre-written generic specifications are in conflict with DGS's standard General Conditions. The Professional must carefully coordinate the specifications with DGS's General Conditions and delete all conflicting language from the specifications. The General Conditions may not be changed without approval of DGS.

902.3 TECHNICAL SPECIFICATIONS SECTIONS. Technical Specification Sections for all prime contracts, based on six-digit section numbers, typically shall be as follows:

- A. General Construction Contract (.1)
 1. Division 02 – Existing Conditions through Division 14 – Conveying Equipment, and Division 31 - Earthwork through Division 33 – Utilities. Note: Certain Sections of Divisions 2, 3 and 31 may apply to other prime construction contracts. The Professional shall clarify the applicable sections to other prime contractors in the Division 1 Specifications.
- B. Heating, Ventilating and Air-Conditioning Construction Contract (.2)

1. Division 23 - Heating, Ventilating and Air-Conditioning
- C. Plumbing Construction Contract (.3)
 1. Division 21 – Fire Suppression and Division 22 - Plumbing
- D. Electrical Construction Contract (.4)
 1. Division 26 – Electrical through Division 28 – Electronic Safety and Security

Note: The Professional, with the approval of the Design Manager, may be permitted to use the previous five-digit section numbering system; however, some section numbers or division numbers referenced in this Manual may need to be converted/adjusted.

902.4 COPIES OF PERMITS. Include a copy of permits obtained for the project in an appendix to the Project Manual. Provide an itemized list of the permits in the Project Manual's table of contents and provide a cover page for each permit identifying the permit when assembling the appendix.

SECTION 903 - INSTRUCTIONS ON SELECTED FRONT-END DOCUMENTS

903.1 PROJECT MANUAL COVER PAGE. This document is to be prepared by the Professional, in conformance with the sample Project Manual Cover Page, Exhibit D1, included in e-Builder. For the Construction Documents Submission, Bidding and Construction sets the Professional Seal of the Registrant in charge of the work must appear on the Cover Page of the Project Manual, with the Registrant's signature applied near or across the seal.

903.2 NOTICE TO BIDDERS. This document will be prepared and uploaded to e-Builder by the Bidding Support & Contract Award Division, of the BOPC.

903.3 TABLE OF CONTENTS. This document is to be prepared by the Professional, in conformance with the sample Table of Contents. See Exhibit D2, Table of Contents, included in e-Builder.

903.4 INSTRUCTIONS TO BIDDERS, FORM OF CONTRACT, CONTRACT BOND, GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT, SPECIAL CONDITIONS. These documents will be prepared and uploaded to e-Builder by the Bidding Support & Contract Award Division, of the BOPC, in preparation for bidding.

903.5 PREVAILING MINIMUM WAGE PREDETERMINATION. This document will be obtained from the Department of Labor and Industry, and uploaded to e-Builder by the Bidding Support & Contract Award Division, of the BOPC, in preparation for bidding.

- A. Certain DGS projects which have federal funding will utilize federal wage rates, as dictated by the Davis-Bacon Act. When applicable, this document will be obtained from the federal government, and uploaded to e-Builder by the Bidding Support & Contract Award Division, of the BOPC, in preparation for bidding.

903.6 SPECIAL CONDITIONS. These are standard DGS documents; however, Special Conditions are not required on every project. When applicable, Special Conditions will be uploaded to e-Builder by the Bidding Support & Contract Award Division of the BOPC, in preparation for bidding.

- A. Special Conditions, when applicable, amend and supplement the Instructions to Bidders and the General Conditions to the Construction Contract (standard DGS documents).

SECTION 904 - NOT USED

SECTION 905 - INSTRUCTIONS ON TECHNICAL SPECIFICATIONS

905.1 STANDARD SPECIFICATIONS. Commercially available master guide specifications, such as ARCOM (AIA) MasterSpec, or SpecText, or BSD Speclink-E™, or similar are acceptable with certain editing

modifications. All paragraphs and subparagraphs must be numbered. DGS Standard Specification Requirements are referenced in this Chapter. These must be incorporated into the contract specifications, as applicable.

905.2 EDITING. Technical specifications sections are to be created to suit the specific requirements of each individual project. Professionals using a standardized specification must edit their specifications to exclude all non-pertinent or non-applicable information. Indiscriminate use of generic specifications, without deleting extraneous material, is sufficient cause for rejection of the entire submission. Procedures specified must not conflict with the DGS General Conditions to the Construction Contract.

905.3 MANDATORY STIPULATION PARAGRAPH. The following stipulation **MUST** appear as the first paragraph of each and every section of the technical specifications:

1.01 STIPULATIONS

- A. The specifications sections “General Conditions to the Construction Contract”, “Special Conditions” and “Division 01 - General Requirements” form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

905.4 PROPRIETARY SPECIFICATIONS. Proprietary specifications are discouraged, and may not be used without specific written approval. See Chapter 2 of this Manual.

905.5 BASIS OF DESIGN. For each product specified, indicate the manufacturer’s name and the product/model designation used as a “basis of design”, to establish a standard of quality, appearance, design, function, and performance. In addition, list the names of at least two (2) other manufacturers (product/model designations may be required) who produce products comparable to the “basis of design”, along with the clause “. . . or equal as approved by the Professional”. When additional product/model designations are required, they must be equal products, to the best of the Professional’s knowledge. In the event that three (3) manufacturers cannot be found, two (2) manufacturers may suffice, if specifically approved by the Department. Avoid designs using features specific to just one manufacturer. For requirements regarding approved equals or substitutions, refer to Article 9 of the General Conditions to the Construction Contract.

- A. Requests for the Department’s approval of “equal” products/systems or “substitutions” will not be considered during the bidding period.

905.6 MANUFACTURERS’ SPECIFICATIONS. Unedited manufacturers’ specifications may not be used. Specify aspects of the product critical to the desired quality, appearance and function for the required item. Avoid specifying unimportant or unnecessary details that may exclude comparable products by other manufacturers.

905.7 PRE-INSTALLATION MEETINGS. Where specialized or critical construction items, materials or equipment are being specified, the Professional should consider specifying the requirement for a pre-installation meeting to be attended by the Professional, Contractor, Supplier, BOC PM and/or APM, and others as may be appropriate.

905.8 REFERENCED STANDARDS. Entire published standards, such as PennDOT Form 408 or SMACNA are not to be referenced. If only a portion is required, include the specific Section, paragraph and subparagraphs being referenced and in the case where options are provided by the referenced specification, identify which option(s) applies to the Project. Provide copies of specific portions of applicable referenced standards/codes to the Bureau of Construction, when requested.

905.9 SPARES AND EXTRA MATERIAL. Unless specifically requested by the Department, extra maintenance material, such as flooring, ceiling tile and mechanical equipment, is not to be specified to be furnished and turned over to the Client Agency or Institution. Exceptions to this rule are electrical fuses and sprinkler heads (per NFPA 13A) required to get a system back on-line, as quickly as possible.

905.10 CORRELATION. The Professional shall cross-reference interrelated items. Subcontractors typically only read and bid on their “trade” portion of the specifications. The Professional should precisely specify what is included in each section of the specifications under “work included” and cross-reference related work or

materials. For example, if the leveling or plumb coat for ceramic tile is specified under “work included” in the Ceramic Tile Section, the Professional should cross-reference the Plaster Section and the Ceramic Tile Section.

905.11 QUALITY CONTROL TESTING. Quality Control tests to be performed by the Contractor are to be included in Section 014000 of the Project Specifications. See the requirement for coordination with Quality Assurance Services by the Professional in Chapter 13.

905.12 QUALITY ASSURANCE TESTING AND INSPECTION SERVICES. QA testing and inspection services by the Professional shall be performed as required by the Department and by Code, under a Work Order. All testing decisions during design must be coordinated with the Design Manager. See detailed requirements for Quality Control and Quality Assurance in Chapter 13.

905.13 BASIC CODES/REGULATIONS. Reference to an edited list of design codes, of the edition currently being enforced, shall be made in each appropriate section of each contract specification, as applicable. The following is a partial list, as a guide:

- A. Life Safety Code – NFPA 101
- B. Pennsylvania Uniform Construction Code (PA UCC)
- C. Pennsylvania Code – Department of Health regulations
- D. National Electrical Code – NFPA 70
- E. National Electrical Safety Code – ANSI C2
- F. ASHRAE
- G. Chapter 405 of the PA UCC “Elevators and Other Lifting Devices”
- H. Safety Code for Elevators and Escalators – ASME/ANSI A 17.1
- I. Accessibility Codes: ADA, UCC (IBC and IEBC) and ICC/ANSI A 117.1, “Elevators and Other Lifting Devices”.
- J. City or Local Municipal Codes

SECTION 906 - RECOMMENDED SPECIFICATION PARAGRAPHS

906.1 GENERAL. DGS standard specification paragraphs are to be included in the appropriate sections of the various contract specifications, when applicable. Standard specifications may be edited to suit the Project, without altering the intent.

906.2 UPDATING. Revisions to current standards and new standards may occur during project development. All revisions and new standards furnished by DGS must be incorporated into the contract documents.

906.3 COORDINATION. The Professional shall develop the design and specifications in accordance with the following:

- A. **Site Utilities:** The General Contractor shall be responsible for providing all site utilities beyond a line 5'-0" outside the exterior of the building walls, except for steam and condensate lines, which shall be the responsibility of the HVAC Contractor, and all electrical power and communication lines, which shall be the responsibility of the Electrical Contractor. When correctional facility security systems are included in work of the General Contractor, the site distribution is also by the General Contractor.
- B. **Earthwork and Concrete:** Each Prime Contractor shall be responsible for providing all trenching, excavation, filling, backfilling, and concrete work required by their respective contract work, and

shall comply with the requirements of the applicable specification sections of Division 3 and Division 31 for same.

- C. When one (1) Prime Contractor is required to perform items of work that are normally included under a different Prime Contract, those items of work shall be performed in strict accordance with the appropriate specification sections of that other Division. The specifications shall be written in such a manner as to refer the Contractor to the appropriate sections, rather than including duplicate specifications. For example, if incidental electrical wiring is required of the General Contractor, do not include electrical specifications in the General Contractors sections, but rather the General Contractor's specifications shall be written to indicate that the work should be performed in accordance with appropriate sections of Division 26, 27, and/or 28. Deviations from this instruction must be discussed with the Design Manager.

SECTION 907 - EARTHWORK SPECIFICATIONS

907.1 DGS REQUIREMENTS: Multiple sections containing earthwork requirements such as excavation, trenching, backfilling, grading, seeding, etc. are allowed as long as the specifications noted herein for unclassified excavation, subsurface information, approval of bearing strata, and quality control testing are incorporated into the main earthwork section. All other sections containing earthwork must reference the main earthwork section for the specifications noted herein. Do not duplicate earthwork sections (such as excavation, trenching, backfilling, grading, seeding, etc.) in the technical specifications of contracts other than General Construction. Where the HVAC, Plumbing, or Electrical specifications require earthwork, it should be specified by requiring compliance with the main earthwork specification in the General Construction specifications. The General Construction earthwork sections (where appropriate) shall incorporate the paragraphs provided below. If there are any special earthwork requirements for Prime or specialty contractors not covered by the General Construction earthwork specification, they should not conflict with the requirements of the main earthwork specifications.

- A. Include the following standard article defining "unclassified" excavation, verbatim:

BASIS OF CONTRACT

1. Excavation for this Project shall be considered unclassified and shall include all types of earth and soil, any pebbles, boulders, and bedrock, municipal trash, rubbish and garbage and all types of debris of the construction industry such as wood, stone, concrete, plaster, brick, mortar, steel and iron shapes, pipe, wire, asphaltic materials, paper and glass. Unclassified excavation does not include unforeseen concrete foundations, walls, or slabs. All such materials encountered which are identified by this paragraph as unclassified shall be removed to the required widths and depths to create a finished product as shown and/or noted on the drawings and as written in the specifications. No additional compensation shall be made to the contractor for this unclassified excavation. The materials defined by this paragraph as unclassified will not be considered to be concealed conditions or unknown physical conditions below the surface of the ground for purposes of interpreting the language in the General Conditions to the Construction Contract.

- B. Include the following standard article on test boring documents, verbatim:

SUBSURFACE INFORMATION

1. Any available data concerning subsurface materials or conditions based on soundings, test pits or test borings, has been obtained by the Department for its own use in designing this Project. The Test Boring location drawings and the Test Boring Logs, as well as the Laboratory Test Results, contained within the Geotechnical Report are incorporated into the construction contract as a Contract Document. The remainder of the Geotechnical Report, with all other exhibits, is available for informational/guidance purposes only; it is not to be relied on by prospective Bidders. The Report is available to Bidders but the Bidders must agree and acknowledge that the information and recommendations in the Report are not warranted for accuracy, correctness or completeness, and is not incorporated into the construction contract as a Contract Document.

2. Test Boring logs reflect the conditions at the specific locations of each Test Boring only. The Contractor accepts full responsibility for any conclusions drawn with respect to conditions between Test Borings. Bidders may perform their own investigation of existing subsurface conditions, with the Department's approval. Excavation for the Project is "Unclassified", as fully described in the Earthwork Section.
- C. Include the following standard article on approval of bearing, verbatim:

APPROVAL OF BEARING STRATA

1. The Contractor shall furnish adequate advance notification to the Department and the Professional of times when footing excavations or paving subgrades are to be completed, so that the Construction Stage Geotech Quality Assurance Agent can verify that the bearing quality of the soil has been properly inspected and/or tested by the Contractor. Formwork and concreting shall follow only after approval by the Construction Stage Geotech Quality Assurance Agent.
 2. Should the bearing at the levels indicated be found by the Professional and the Department to be inadequate, they may order the excavation carried down to sound bearing. Such excavation shall be classed as additional work and payment be made on the basis of an agreed price according to the General Conditions. Should suitable bearing be found at a lesser depth than indicated, the Professional and the Department may order the reduction of excavation specified or shown on the drawings, and the Contractor shall allow a credit for excavation thus omitted on the same basis.
- D. Include the following standard article on testing, verbatim.

QUALITY CONTROL TESTING

1. The Contractor shall perform all necessary Quality Control tests and procedures for the performance of the work, in accordance with Section 014000 and this section, to produce the end results specified. The Contractor's Quality Control Agent shall maintain clear and orderly records of such tests and procedures and make them available for field review and approval of the Professional and the Department. The Contractor's bid shall include the cost of all Quality Control tests and inspections.
2. The Contractor shall submit its plan for Quality Control testing to the Professional and the Department for review and comments. The Professional shall consult with its Quality Assurance Agent in arriving at its opinion.
3. Quality Control tests shall include tests on fill material, optimum moisture content and maximum density and field density tests of fill layers. The Quality Control Agent shall comment on the suitability of all subgrades, and the subgrades shall be acceptable to the Consulting Geotechnical Engineer.
4. Handwritten copies of field test reports shall be provided to the Contractor. They shall be given to the Contractor and inspector within two (2) hours of completion, but in no event shall the technician leave the site without providing the Contractor and inspector with a copy of the test results. This shall include density, % moisture, plan location, elevation, comments and any other relevant data. Comments shall include any condition that might have an adverse effect on the operations, including weather, drainage, etc.
5. The Contractor shall request consultation with the Consulting Geotechnical Engineer on any problems that arise during construction. Copies of the daily in-place soil density tests shall be faxed to the consultant by the Contractor through the testing agency within twenty-four (24) hours of the time the tests are made.

6. The Contractor shall approve each subgrade and each fill layer before proceeding to the next layer. Any area which does not meet density, % moisture or other requirements at any time, shall be suitably reworked and retested by the Contractor at his own expense.
 7. The Professional and/or the Department will perform all Quality Assurance Testing and Inspection Services deemed necessary for the assurance of the Professional and/or the Department. This does not relieve the Contractor of his responsibilities. The Department will bear the cost of Quality Assurance tests and inspections.
- E Compaction standards are to be based on Modified Proctor standards, as defined by ASTM D1557.

SECTION 908 - DRILLED PIER SPECIFICATIONS

908.1 DGS REQUIREMENTS. Drilled piers are to be specified as unclassified excavation. The scope of the unclassified excavation includes the designed quantities and all quantity changes which result in Unit Price adjustments. The Unit Prices for changes in quantities are to be prices per linear foot for each diameter drilled pier. The price is to apply to all quantity changes, Add or Deduct, based on unclassified material. The Unit Price presented in the bid for Adds must be the same cost submitted for Deducts. The Unit Prices shall include all work in connection with each drilled pier, including drilling, disposal of drilled material, casing as required, concrete, reinforcing, etc. and including all labor, materials, tools, equipment, overhead, profit, insurance and taxes for same.

SECTION 909 - CAST-IN-PLACE CONCRETE SPECIFICATIONS

909.1 DGS REQUIREMENTS. The cast-in-place concrete specifications, including site work related concrete (i.e. – sidewalks, curbing, paving, etc.), should be based upon requirements of ACI 301, except samples are to be taken and broken by the Quality Control Agent for each 50 cy of concrete. Slump tests and recording of temperature is to occur for each truckload. Air tests are to occur with each sampling that contains air. See recommended tests in table in Section 014000. As described above for earthwork, the Concrete specifications should not be duplicated in the technical specifications of contracts other than General Construction. Follow the instructions in paragraph 902.2 on adding a paragraph in Section 010400. Also, include a penalty for accepted under-strength concrete, by including the following language in the cast-in-place concrete specification:

“If compressive strength of in situ concrete is accepted, either without additional testing or on the basis of testing other than original cylinder compressive strength tests, the Contractor shall compensate the Department for the Contractor’s failure to meet specified strength requirements by paying to the Department one hundred dollars (\$100) per cubic yard for each one hundred pounds per square inch (100psi) below the specified compressive strength. The original laboratory cured 28-day cylinder compressive strength test results only shall be used to determine the difference between specified and furnished strengths.”

SECTION 910 - UNIT MASONRY ASSEMBLIES SPECIFICATIONS

910.1 DGS REQUIREMENTS. As an alternative method of fulfilling the requirement in Chapter 17 - Special Inspections of the IBC for “continuous” inspection of grout placement in CMU cores, the specifications shall require that the Contractor mark in an approved manner the location of filled cores for the QA Agent to verify the presence of reinforcing steel using a rebar locator and the presence of grout using an ultrasound device. For a complete list of Special Inspections exceptions granted by L&I, see Exhibit G2 (included in e-Builder).

SECTION 911 - STRUCTURAL STEEL SPECIFICATIONS

911.1 DGS REQUIREMENTS. As an alternative method of fulfilling the requirement in Chapter 17 – Special Inspections of the IBC for “continuous” inspection of high-strength bolting in slip-critical connections, the specifications shall require the Contractor to use Direct Tension Indicator Washers or Twist-Off bolts or other systems providing visual verification of proper tightening. Require the Contractor’s QC Agent to provide field proof of appropriate tightening methods and calibration of the Contractor’s equipment as necessary to ensure

compliance. This shall be approved by the Professional and its QA Agent. For a complete list of Special Inspections exceptions granted by L&I, see Exhibit G2 (included in e-Builder).

911.2 STEEL FABRICATORS. As an alternative method of fulfilling the requirement in Chapter 17 – Special Inspections of the IBC for inspection on the premises of a fabricator’s shop, the specifications shall include a requirement that the steel fabricator be AISC-Certified. Require the Contractor’s steel fabricator to provide documentation as described in Paragraph 1704.2.2 of the UCC. For a complete list of Special Inspections exceptions granted by L&I, see Exhibit G2 (included in e-Builder).

SECTION 912 - ARCHITECTURAL SPECIFICATIONS

912.1 PURPOSE. To specify construction materials, methods and/or contract requirements, determined to benefit the Department and required to be included in all applicable projects. The following provisions are to appear in all specifications, unless obviously inapplicable.

912.2 ROOFING WARRANTY. The Professional shall include the following paragraphs in each Roofing Section to specify the Department’s requirements regarding the required warranties required for roofing work. In addition, the Professional shall include in the specifications a requirement that a draft of the roofing warranty be included with the roof system submittal (shop drawings).

A. Quality Assurance:

1. Manufacturer Qualifications: The manufacturer shall have a minimum of ten (10) years’ experience in the production of the type of roofing herein specified, and shall be able to show experience with projects of similar size and complexity.
2. The Installer Qualifications: The installer shall have a minimum of five (5) years’ experience installing the type of roofing herein specified, on projects of similar size and complexity.

B. Contractor’s Warranty:

1. Contractor’s Responsibility: The General Contractor shall take, or cause to have taken, any and all corrective measures necessary to keep the roofing system free of all defects, to the satisfaction of the Department, and to maintain the roofing system in a watertight condition. The Contractor shall have the responsibility for said corrective measures for two (2) years after the date of Final Inspection. The Contractor shall be responsible for the removal and replacement of the roofing system, if in the judgment of the Department, removal and replacement is necessary to keep the roofing system free of all defects or to maintain the roofing system in a watertight condition. The Contractor shall also repair, or remove and replace, if the Department deems it to be necessary, any part of the building, including the interior, damaged as a result of leaks in the roofing system. The interior of the building includes, but is not limited to, the furnishings and fixtures. There shall be no limit to the Contractor’s liability for fulfilling the aforementioned responsibilities.
 - a. Final Inspection shall include a statement, supplied by the Contractor and signed by an authorized representative of the roofing manufacturer, attesting to the fact that the roofing installation and finished condition is acceptable for warranty by that manufacturer.
2. Exclusions: The Contractor shall not be responsible for repairs to, or replacement of, the roofing system, if repairs or replacement is necessary due to a natural disaster, such as lightning, hail, flood, tornado or earthquake.
3. Notification: The Department will notify the Contractor, as soon as reasonably possible, after it has knowledge of defects in the roofing system. Should the Contractor fail to promptly take corrective measures, the Department may undertake corrective measures. The Contractor shall be responsible for any and all expenses incurred by the Department in undertaking the necessary corrective measures. In addition, the Department’s undertaking of corrective measures shall in no way relieve the Contractor of any of the aforementioned responsibilities.

C. Manufacturer's Warranty:

1. The General Contractor shall provide the Department with a twenty (20) year warranty, furnished by the manufacturer, which shall warrant that the said manufacturer will repair any leaks in the roofing system, not to exceed the original cost of the installed roof over the life of the warranty, installed by an applicator authorized by said manufacturer.
2. Leaks from the following causes shall be covered by the manufacturer's warranty:
 - a. Defects in the roofing system material.
 - b. Workmanship of the authorized applicator.
3. The following exclusions are permitted in the manufacturer's warranty:
 - a. Natural disasters such as lightning, hail, floods, tornadoes or earthquakes.
 - b. Damage from traffic or storage of materials on the roof.
 - c. Structural failure of roof deck, parapet or coping.
 - d. Infiltration of moisture in, through or around walls, coping or building structure.
 - e. Movement or deterioration of metal counterflashing or other metal components adjacent to the roof.
 - f. Damage to the building (other than roofing and insulation) or its components adjacent to the roof.
4. The warranty shall provide that in the event a leak should occur within the warranty period, and if such leak is within the coverage of the warranty, the warrantor will, at no expense to the Department, make or have made, all necessary repairs to put the roof membrane, base flashing and roof insulation in a dry and watertight condition, using the same materials and specifications as the original application. There will be no limit to the warrantor's liability for making such repairs over the period of the warranty.
5. The warranty shall provide that if, upon proper notification, the warrantor fails to promptly repair the roof, and the Department may make temporary repairs to avoid damage to the facility. Such action shall not be considered a breach of the provisions of the warranty.
6. The Department shall be permitted to make alterations, additions and repairs to the roof, within the written approved guidelines of the warrantor without jeopardizing the unexpired portion of the warranty's original term.
7. Metal roofs and exposed fasteners shall be warranted against rust. Also, on metal roofs, the manufacturer, upon completion, inspection and written acceptance of the roof installation, shall furnish a warranty covering paint finish against cracking, checking, blistering, peeling, flaking and chipping for a period of twenty (20) years.

912.3 FINISH HARDWARE. The Professional shall include the following series of paragraphs in the Finish Hardware Section to specify DGS requirements regarding locks and keying. Edit as required for each particular project, but do not substantially alter the intent.

- A. All locks shall be furnished with removable core cylinders, and shall be a factory recorded continuation or extension of an existing keying system previously furnished for this institution.
 1. New building: A new keying schedule shall be started in accordance with Paragraph E. The keying records for both new buildings and existing buildings belong to the Commonwealth of Pennsylvania and on request, in writing, will be furnished in accordance with Paragraph B.
 2. Existing system where small quantities of cores are required: The Institution shall specify the keyway required and uncombined cores and key blanks needed. The combining will be done by the Institution.

3. Existing system where large quantities of cores are required: The Institution shall furnish the keying records to the Director of the Key Record Department of the Lock Company, so that cores can be combined in the factory and in accordance with paragraph B.
- B. The Key Coding records shall be sent by Registered Mail to the Institution's Facility Maintenance Manager at the completion of the Project. These records shall go directly from the Manufacturer to the Institution and shall not pass through the hands of the Hardware Distributor.
- C. Cylinders shall be furnished complete with collars, construction cores, 7-pin interchangeable cores, and two keys per cylinder. Cylinders shall be of correct type and length, fitted with correct cam or bar for operation of lock, and furnished with back plates and screws where required.
- D. Construction cores shall be supplied to the General Contractor during the period of construction. These construction cores shall be returned to the Manufacturer after the permanent master keyed cores are installed.
- E. Cores are to be Grand Master Keyed, Master Keyed, Keyed alike in Groups, and/or Keyed individually, as approved by the Institution. A Keying Schedule showing each door location, Manufacturer's lock number, Manufacturer's cylinder type number, finish, length, cam or bar type, and keying detail, shall be prepared by the Cylinder Manufacturer's Representative for the Hardware Supplier, and submitted to the Institution for approval. The Cylinder Manufacturer's Representative shall provide technical assistance and information to the Institution in establishing the keying system. Master keyed cores shall be installed by the General Contractor.
- F. Furnish six (6) Master Keys for each group. Furnish six (6) Grand Master Keys and one (1) Control Key, if a new Grand Master Key System is established. The above keys shall be included with the shipment of permanent cores.
- G. More specific requirements may be provided for locks and keying in State Correctional Institutions and if so, supersede these requirements."

SECTION 913 - HVAC SPECIFICATIONS

913.1 PURPOSE. To provide information to assist the Professional in the preparation of contract drawings and specification for the Heating, Ventilating and Air Conditioning systems, and to assure consistency in contract documents to reduce errors of omission and/or commission.

913.2 GENERAL INFORMATION. The Professional shall follow these general guidelines in designing and documenting the HVAC work for all DGS projects.

- A. The Professional shall comply with the latest applicable codes, standards and regulations:
 1. ASHRAE Handbooks to be used as Industry Standards
 2. ASHRAE Published Standards, as appropriate
 3. ASHRAE 62 – Ventilation for Acceptable Indoor Air Quality
 4. ASHRAE 15 – Safety Code for Mechanical Refrigeration
 5. ASHRAE 34 – Number Designation and Safety Classification of Refrigerants
 6. ASHRAE 90.1 – Energy Design New Buildings
 7. Life Safety Code – NFPA 101
 8. NFPA Published Standards, as appropriate
 9. SMACNA Standards for Ductwork
 10. International Energy Conservation Code
 11. Pennsylvania Air Pollution Control Act, Title 5 (DEP)
 12. Pennsylvania L&I Boiler Code
 13. Pennsylvania Code – Health Department
 14. Pennsylvania Uniform Construction Code (UCC)
 15. City and Local Codes, as applicable
 16. Other codes and regulations determined to be applicable

- B. Energy Conservation – To assure energy conservation in design of space heating and cooling systems in new and renovated buildings, the design criteria set forth in ASHRAE Standard 90.1 and the International Energy Conservation Code shall be used, whichever is more stringent.
- C. Vibration and Sound Controls: The Professional is to design HVAC systems with vibration and sound controls as appropriate for the spaces involved. The ASHRAE HVAC Application Manual shall be used as a guide for Vibration and Sound Design Criteria. Use of air-conditioning system condensers, especially air cooled units, are to be discussed with the Agency and the Department relative to sound and vibration criteria. Professional is to monitor design and field changes during construction with the effect of changes on sound and vibration distribution. Contractor shall perform measurements and provide report to Professional for approval.

Note: The Professional shall consult with the Client Agency and/or Institution to determine requirements for special usage areas. Special attention shall be taken for such areas as auditoriums, conference rooms, classrooms and hospital patient rooms.

- D. Seismic and Wind Restraint Design is required by Code and is to be designed using ASHRAE HVAC Application Manual for guidance.
- E. The Professional shall present in its documents flow diagrams for all air systems, indicating hot and chilled water distribution, outside air, exhaust air, supply air and air movement within buildings and spaces. An air flow diagram is to be included in Design Development Submission and all subsequent Submissions.

913.3 HVAC SPECIFICATION GUIDE. Guide information and direction may be distributed to the Professional by the BOPC during design.

- A. A first draft HVAC specification shall be provided with the Design Development Submission. See Chapter 9 for more specification format information.
- B. All engineering analysis and computations, drawings, specifications and other documents shall be prepared by a Registered Professional Engineer, or under the responsible supervision of a Professional Engineer, and must bear the Professional seal and signature of the Engineer.
- C. The Professional is to design to good engineering practices. The Department reserves the right to direct the Professional to use materials, systems, performance characteristics, or equipment that it determines to be in the best interest of the Client Agency, Project, and/or Department even if beyond the code requirements.
- D. Specifications for DGS projects are “or equal” specifications (see Section 905.5). The Professional must use care not to specify any requirements that may unnecessarily restrict bidders; such as geographic district, training by either union or non-union sources (specifically training for insulators), or products that are union-certified. Requirement for training by the product manufacturer is acceptable. If uncertain, discuss with the Design Manager.

913.4 BALANCING AND ADJUSTING HVAC SYSTEMS. The following paragraphs are intended to guide the Professional in preparing the Testing and Balancing (TAB) specifications.

- A. The balancing firm’s report shall include a section which will provide all information regarding all problems encountered prior to, during and remaining after test and what action should be taken to correct the problem(s).
- B. The Professional must review and approve the final test report. Should problems remain to be resolved, the Professional shall submit the reports for the Department’s review, with comments as to the nature of the problem and acceptability of the system(s) and/or action which may need to be taken.

- C. No Final Reports shall be submitted which indicate that the system(s) is incomplete, inoperative or that unresolved problems exist.
- D. Specification for the testing shall include:
1. The HVAC Contractor shall provide as part of this contract the services of an independent testing and balancing firm as listed by the Associated Air Balance Council (AABC), NEBB or a qualified firm as approved by the Department or the Professional. The HVAC Contractor will be responsible for all balancing work.
 - a. At the Department's discretion, a separate Prime TAB Contract may be required. If the Department determines that a separate TAB Prime Contract is warranted, the Professional shall coordinate this Prime with the HVAC Prime Contract, as required for test and retest requirements.
 2. The HVAC Contractor and its selected and approved balancing firm shall report to and review the work required with the Professional prior to beginning of work. At least two (2) 1-day inspections of the Hydronic and Air Systems at appropriate times during construction shall be made by the balancing firm and it shall report its findings to the Professional and DGS in a written report. The Professional shall impose upon the Contractor that all openings, pressure taps, wells and closures required, over and above those shown on the drawings, to perform the required test and adjustments shall be installed during or after construction at no additional cost to the Department.
 3. The Contractor shall furnish all services for a minimum of two (2) complete adjustments of water systems and air handling and exhaust systems, water and air distribution and controls, for the first cooling season and for the first heating season after the job is in complete operation under load conditions. The Testing and Balancing Contractor is responsible for all retests where equipment changes or adjustments are required.
 4. During all tests, it shall be demonstrated that the systems are free from leaks and that all parts of the system will operate correctly. The Testing and Balancing Contractor shall make final adjustments to all equipment and controls as may be required for proper operation, maintaining correct temperatures in all parts of the building. Controls shall be adjusted by the control manufacturer's mechanics, on the advice of the balancing firm.
 5. The final test report shall include appropriate reference to all problems regarding the system(s) encountered prior to, during and after testing and what action should be taken to correct the problem(s), including noise and vibration.
 6. The following work shall be included by the Balancing Firm: The Professional shall include this direction in the HVAC specifications.
 - a. Supervise the balancing of all water circulation systems and parts thereof installed under this contract to obtain the water quantities and temperature drops in all parts of the system specified in the plans and in the specifications, or as required by the Professional.
 - b. Supervise the balancing of the air conditioning and ventilating systems to achieve the air quantities specified at each air inlet, outlet and damper shown on the plans at the proper conditions of static pressure and temperature differential. Conduct all leakage tests on ductwork in a manner acceptable to the Engineer and the Department. Leakages shall not exceed 3% of total air to be delivered.
 - c. Study and report on noise and vibration problems, which may develop in the course of system balancing.
 - d. Submit reports on the cooling and heating water circulating systems, ATC system, and heating and ventilating systems. These reports shall certify test methods and instruments used, all readings obtained, temperature and pressure drops, rpm of equipment, amperage of all motors, air quantities at each outlet supply, return and air balancing problems encountered and suggestions. Reports to be submitted to the Professional and the Department shall include data on all tests in the form normally used

by AABC and NEBB. The reports must however, be varied to suit these specifications. Reports shall include fan and pump curves for the final speeds developed from the fan manufacturer's performance test data for all major equipment, and schematics for ALL systems tested. If the Department has contracted for Commissioning Services, the Contractor shall conform his forms and reports to the Commissioning Agents requirements. (See Chapter 13).

- e. Perform tests on heating systems when the outside temperature is averaging less than 30°F and on cooling systems when the outside temperature is above 80°F.
- f. Instruct the building maintenance employees for all shifts as required during the adjusting and balancing period. Obtain signed statements from each employee verifying this instruction has been received by each.
- g. Carry out the 'start-up' of the various systems with the Contractor and with any necessary assistance of the equipment manufacturer's representative.
- h. Furnish all instruments and provide all instrumentations required to perform the above work. The equipment and instrumentations shall remain the property of the balancing Subcontractor; however, all equipment must be first approved by the Professional before being used on the Project.

913.5 COAL-FIRED BOILERS. If coal-fired boilers are being installed on the project, contact the Department's Design Manager for specific requirements, procedures, and forms that must be utilized.

913.6 PIPE AND DUCT PENETRATIONS. In compliance with the requirements of NFPA 90A, it is essential that the Professional determine and indicate locations of all horizontal and vertical fire separations and the hourly requirement of the separation on the contract floor plans and building sections.

- A. The HVAC plans shall show where ducts, pipes and conduits pierce required fire rated separations with standard symbols for:
 1. Duct penetration of vertical separation.
 2. Duct or shaft penetrations of horizontal separation.
 3. Ceiling dampers for opening protection in a floor-ceiling or roof-ceiling assembly.
 4. Location of duct fire dampers.
 5. Location of duct smoke detectors.
- B. A duct access door shall be specified at each fire damper, and ATC sensor location, for inspection and resetting the fire damper. Typical detail(s) shall be shown on the drawings.
- C. There may be occasion where ceiling or wall access panels need to be provided to reach duct access doors or above ceiling pipe valves. In such cases, both the general construction and HVAC drawings shall so indicate where required and typical arrangement detail. All access panels shall be shown on the general construction drawings and the General Contractor shall provide and coordinate the access panel with the HVAC Contractor's duct shop drawings.
- D. Duct smoke detectors shall be furnished by the Electrical Contractor, installed into the duct by the HVAC Contractor and wired to the alarm system by the Electrical Contractor.
- E. When dampers and detectors are to be controlled by a Central Fire Management System, including sprinkler system monitoring, the HVAC Contractor shall install the dampers and detectors.
- F. Approved fire and smoke sealant shall be used at all pipe penetrations of fire rated walls, floors and ceilings.

913.7 ELECTRICAL EQUIPMENT WIRING. The Professional shall refer to Section 1317 for electrical equipment wiring contractual and coordination responsibilities by all Primes.

- A. Wiring for Heating, Ventilating and Air-Conditioning:
 1. All equipment, unless otherwise indicated, for the heating, ventilating and air conditioning systems shall be furnished and installed under the HVAC Contract. The Electrical Contractor

shall however, be responsible for furnishing all labor and materials required for the installation and connection of all electrical power wiring to and for this equipment.

2. In general, all special control equipment required for the heating, ventilating and air conditioning equipment such as water chiller, condenser, condensing units, air handling units, water heaters, pumps and air compressor, will be furnished and installed under the temperature control section of the HVAC contract.
- B. Temperature Control Wiring:
1. All interlocking control wiring in connection with the temperature control system for all heating and air conditioning systems shall be furnished, installed and connected under the HVAC contract.
 2. The Electrical Contractor shall provide a source of power and make final power connections at each air handling unit and at each apparatus control panel location where noted on the plans. Panels shall be furnished and installed under the HVAC contract.
- C. Coordinate with Other Contracts: **[Add to HVAC Specifications]** – “All wiring and conduit furnished and installed by the HVAC Contractor shall be in strict accordance with the Electrical specifications. The HVAC Contractor shall employ workmen who are skilled in the trades involved for the installation of this work.”

913.8 ABOVEGROUND STORAGE TANKS (AST) AND UNDERGROUND STORAGE TANKS (UST) SPECIFICATIONS. The Pennsylvania Storage Tank and Spill Prevention Act of 1989 dictates all installation, modification, removal and inspection activities related to regulated aboveground and underground storage systems. Therefore, the Professional shall prepare associated specifications and drawings to assure that such storage tanks comply with Chapter 245 – Administration of the Storage Tank and Spill Prevention Program.

- A. All removal, installation and repair operations shall employ DEP certified Contractors as required.
- B. Stand-alone projects related to storage tanks shall be performed as a (.6) specialty contract.
- C. All utility and regulatory permits, certifications, closure reports and fees must be addressed and satisfied by the Contractor.
- D. Underground Storage Tanks (UST): Tank removal shall include the following information in the specifications:
 1. Size of tank, type of fuel used in the tank, tank composition, how much fuel remains, whether ballast pad remains or not and scope includes soil backfilling and compaction per Earthwork Section.
 2. The specifications/drawings will direct the Contractor to dispose or remediate a finite amount of contaminated soil.
 3. Dewatering the excavation and proper disposal of any captured water, whether contaminated or not, is the Contractor's responsibility.
 4. The removal and disposal of contaminated soil and ground water will be supervised by the QA monitoring Consultant engaged by the Professional.
- E. Regulatory Compliance:
 1. Regulatory Submittals:
 - a. The certified tank installer shall be responsible for notification and/or submittals required by the Pennsylvania Department of Environmental Protection. All notifications and submittals shall be copied and turned over to the Bureau of Construction, which

shall file copies with project records and forward copies to the Agency for the purpose of record keeping required by DEP regulations.

- b. The Pennsylvania Department of Environmental Protection, Bureau of Water Quality Management Regional Office for this project site is:

[Professional to provide local regulating DEP office address and telephone number]

2. Soil Testing:

- a. The DEP certified installer shall conduct soil testing after removal of the storage tank(s) and pipe systems to measure for contamination which may have occurred during the operation of the system.
- b. The soil testing shall be conducted in compliance with all DEP and local regulations.
- c. The certified installer shall take separate samples of the soil and test for specific constituents.
- d. Samples shall be tested for presence of specific petroleum hydrocarbons, MTBE and lead at former leaded gas UST.
- e. The certified installer shall submit to DGS the laboratory test results, along with a copy of the methodology of testing, and a quality assurance plan from the testing laboratory.
- f. All analysis shall be conducted by DEP and EPA Methodology when available

3. Contaminated Materials:

- a. The certified installer shall notify DEP and obtain approval for disposal of contaminated materials. Materials shall be disposed of in accordance with DEP requirements.
- b. The landfill area used for disposal of materials shall be certified to receive and bury materials contaminated by petroleum products. The Contractor shall obtain from DEP, a list of certified landfill sites. The certified installer shall make arrangements with and obtain approval from landfill manager prior to hauling material.
- c. Disposal of contaminated water, sludge, or unusable product (fuel, oil, gasoline) shall be done by a method approved by DEP and the EPA.
- d. The certified installer shall submit copies of all DEP permits, approvals and letters of notification to the Department.

SECTION 914 - PLUMBING SPECIFICATIONS

914.1 PURPOSE. The purpose is to provide guide information to assist the Professional in the preparation of contract drawings and specification for the various plumbing systems and fire protection system, and to assure consistency in specifications.

- A. Generally, the interior fire protection system would fall within the Plumbing (.3) contract; however, when the extent of the fire protection system is large it may be determined by Department that the fire protection system shall be a separate Prime Contract.
- B. Specifications for DGS projects are "or equal" specifications (see Section 905.5). The Professional must use care not to specify any requirements that may unnecessarily restrict bidders; such as geographic district, training by either union or non-union sources (specifically training for insulators), or products that are union-certified. Requirement for training by the product manufacturer is acceptable. If uncertain, discuss with the DGS Design Manager.

914.2 GENERAL INFORMATION. The work covered by this specification includes the Plumbing Contractor furnishing all labor, material, equipment and services and performing all operations in connection with the plumbing installation, complete, in strict accordance with this specification and the applicable drawings.

- A. The work of the Plumbing contract shall consider the following:

1. Plumbing Contractor shall provide roof drains to General Contractor for installation. Roof drain selection shall be coordinated with the roof construction.
 2. The results of hydrant flow tests shall be listed on the drawings with the performance date. Note: If the fire protection system is of a major size, it is advisable to prepare a separate 'Fire Protection System' prime contract. Review the need for a separate contract with the Design Manager.
 3. If the condensate drains are provided under the HVAC Contract, the Plumbing Contractor shall provide appropriate indirect waste connections.
- B. The Professional shall comply with the latest applicable codes and regulations:
1. Pennsylvania Uniform Construction Code (UCC).
 2. Fire Protection Systems – NFPA
 3. Sprinklers NFPA 13
 4. Life Safety Code – NFPA 101
 5. Accessibility Codes: ADA, UCC (IBC and IEBC Chapter 11) and ICC/ANSI A 117.1
 6. Pennsylvania Code – Health Department
 7. Other codes, standards and regulations, as applicable
- C. The Professional is to design to good engineering practices. The Department reserves the right to direct the Professional to use materials, systems, or equipment that it determines to be in the best interest of the Client Agency, Project, and/or Department even if beyond the code requirements.
- D. Electrical Equipment Wiring:
1. All equipment, unless otherwise indicated, for the plumbing system shall be furnished under the Plumbing Contract. The Electrical Contractor shall however, be responsible for furnishing all labor and materials required for the installation and connection of all electrical power wiring to and for this equipment.
 2. In general, all starters and special control equipment required for electrically operated equipment furnished under the Plumbing Contract, such as the pumps and the electrical water heaters will be furnished and installed by the Plumbing Contractor.

SECTION 915 - ELECTRICAL SPECIFICATIONS

915.1 PURPOSE. To specify construction materials, methods and contract requirements, determined to benefit DGS included in all applicable projects. Information included shall be edited by the Professional to suit the project under design.

915.2 APPLICABLE CODES AND REGULATIONS. Electrical design shall comply with the latest applicable codes:

- A. National Electrical Code – NFPA 70
- B. National Electrical Safety Code – ANSI C2
- C. Life Safety Code – NFPA 101
- D. Pennsylvania Uniform Construction Code (UCC)
- E. Pennsylvania Code, Department of Health Regulations
- F. City or Local Codes, as applicable
- G. Accessibility Codes: ADA, UCC (IBC and IEBC 2012 Chapter 11) and ICC/ANSI A 117.1
- H. Other codes, as applicable

915.3 SPREAD OF FIRE, OR PRODUCTS OF COMBUSTION. The Project design and specifications shall be developed in accordance with the following.

- A. All lighting, power, control and fire alarm wiring shall be run in rigid metal conduit, intermediate electrical conduit, electrical metallic tubing, flexible metallic conduit, liquidtight flexible metal conduit, surface metallic raceways, or metal wireways within the parameters established by the National Electrical Code and applicable DGS design parameters.
- B. Plastic conduit, which may produce toxic smoke or contribute to the spread of fire, shall not be used without permission from the Department. Plastic conduit installed underground or in concrete encasement will be acceptable. Plastic conduit shall not be exposed outdoors.
- C. Non-metallic sheathed cable or armored cable is not to be used, except with special permission from the Department.
- D. All telephone, television, electronic data processing, sound and other telecommunication cables shall be run in conduit as specified above, except as follows:
 - 1. Data processing cables installed under raised floors shall comply with NEC Article 645.
 - 2. Plenum conductors shall be listed as having adequate fire resistant and low smoke producing characteristics. Conductors insulated with materials that produce toxic smoke are not acceptable. The manufacturer of the cable shall certify that its product complies with the above.
 - 3. All cables shall be supported per EIA/TIA standards.

915.4 SURGE PROTECTION. All electrical systems susceptible to damage by lightning or other surges shall incorporate surge protection to protect the equipment. The equipment shall be protected from surges on the downstream side of the equipment as well as from surges on the incoming lines. Surge protection shall be specified as factory installed on all input and output terminals where the transmitting control panel is interconnected with other buildings for remote annunciation, alarm or data interface.

915.5 INSTALLATION OF EMERGENCY OR STANDBY GENERATORS. Contract responsibilities for the furnishing and installing of materials and equipment associated with emergency or standby generators shall be broken down as described below. The project design and specifications shall be developed in accordance with the following.

- A. General Contractor (GC or .1):
 - 1. Install intake and exhaust air louver(s) furnished by HVAC Contractor.
- B. HVAC Contractor (HC or .2):
 - 1. Furnish and install all engine exhaust piping.
 - 2. Install engine exhaust muffler(s) furnished by Electrical Contractor.
 - 3. Insulate all muffler and exhaust line piping.
 - 4. Furnish and install drip loop(s) in exhaust line piping.
 - 5. Furnish and install LP fuel tank, and piping.
 - 6. Furnish and install UST or AST diesel fuel tanks with levelometers and piping.**
 - 7. Furnish, install and connect all natural gas or LP fuel lines; including flexible connectors.
OR
 - 7. Furnish, install all diesel fuel lines, including flexible connectors.**
 - 8. Install gas regulator(s) furnished by Electrical Contractor.
OR
 - 8. Install diesel fuel day tank furnished by Electrical Contractor.**
 - 9. Provide all excavation and backfill required for installation of underground tanks and fuel lines.

10. Furnish motorized intake louver(s)* to General Contractor for installation. (Wired by Electrical Contractor)
11. Furnish exhaust air louver(s)* to General Contractor for installation.
12. Furnish and install all intake air and exhaust air duct work, including flexible connectors.

C. Electrical Contractor (EC or .4):

1. Furnish and install concrete pad (minimum 6" high), vibration isolators and anchor bolts for the engine generator set(s).
2. Furnish and install the engine generator set(s).
3. Furnish and install the automatic transfer switch(s).
4. Furnish and install associated lighting and power panels, area protection monitors, etc.
5. Furnish pressure regulator(s) for natural gas or LP fueled engines to the HVAC Contractor for installation.
6. Provide day tank(s) for diesel-fueled generators in place. The HVAC Contractor shall do pipe installation, if not factory-installed.
7. Furnish, install and connect power and control wiring to the engine generator set(s) and all associated equipment.
8. Furnish exhaust mufflers to HVAC Contractor for installation.

* Finishes to be coordinated by the Professional.

** HVAC Contractor shall comply with the requirements of the Storage Tank and Spill Prevention Act of 1989 and shall be listed by the Department of Environmental Protection as a certified installer.

- D. Proper specifications and installation will require close coordination between the Professional, its Consultants, and Project Reviewers of the various design disciplines, as well as between all Contractors.

915.6 EMERGENCY AND/OR STANDBY GENERATOR TESTING. Emergency or standby generators shall be tested at full load for four (4) hours using resistance banks.

- A. Readings of all pertinent data shall be recorded at ten (10) minute intervals for the first two (2) hours, and at thirty (30) minute intervals for the remainder of the test.
- B. In the event that it becomes necessary to abort the test, another full four (4) hour test shall be made after correction of the problem(s).

915.7 MEDIUM VOLTAGE SHIELDED POWER CABLE AND FIELD TESTING. Following are cable and field testing specifications for XLP and EPR cable. The selection of the cable type will be the responsibility of the Professional in concurrence with the Client Agency or Institution.

A. EPR Cable:

1. General:

- a. Scope – This specification covers single conductor, ethylene propylene rubber insulated, shielded and jacketed power cable for use at 5,000 or 15,000 volts, 133% insulation level. Cable shall be rated at 90°C for normal operation; 130°C for short circuit conditions. Cables shall be UL listed and designated MV-90 in accordance with the National Electrical Code.
- b. Standards – The cable shall meet or exceed the industry standards of the latest edition of ICEA-NEMA Standard S-68-516, WC-8 and AEIC Standard CS-6.

2. Cable:

- a. Basic Construction – Cable shall have a single Class 'B' stranded bare copper conductor, extruded semi-conducting conductor screen, ethylene propylene rubber insulation, extruded semi-conducting insulation screen, copper tape shielding and extruded PVC

jacket. The cable conductor screen, insulation and the insulation screen shall be manufactured by employing an in-line triple tandem extrusion process.

- b. Conductor – Annealed copper with concentric lay Class ‘B’ stranding conforming to ASTM B 8 and ICEA S-68-516, Part 2.
- c. Conductor Screen – Extruded layer of semi-conducting ethylene propylene rubber compound shall be applied over the conductor. The DC volume resistivity of the screen shall not exceed 50,000 ohm/cm at 90°C when tested in accordance with AEIC No. CS-6. The conductor screen shall be clean stripping from the conductor and inseparably bound to the overlying insulation.
- d. Insulation – Ethylene propylene rubber with physical and electrical characteristics that comply with the requirements of ICEA Standard S-68-516. The insulation thickness shall be as follows for 133% insulation level.
- e.
 - 5 KV - 115 Mils
 - 15KV - 220 Mils

The thickness at any cross-section of the insulation shall not be less than 90% of the specified thickness.

- e. Insulation Screen – Extruded layer of semi-conducting ethylene propylene rubber compound shall be applied over the insulation. The DC volume of resistivity of the screen shall not exceed 50,000 ohm/cm at 90°C when tested in accordance with AEIC No. CS-6. Average thickness shall be in accordance with AEIC.
- f. Metallic Shield – Non-magnetic metallic conducting covering consisting of a 5 mil copper tape helically applied with a minimum overlap of not less than 12.5%.
- g. Cable Jacket – Polyvinylchloride jacket meeting the physical requirements of ICEA. The jacket shall have a minimum average thickness in accordance with ICEA S-68-516.
- h. Identification – The following information shall be permanently printed every 24” on the surface of the jacket.

- 1) Manufacturer
- 2) Conductor Size and Type
- 3) Insulation Type and Thickness
- 4) % Insulation Level
- 5) Rated Voltage
- 6) MV-90
- 7) Year of Manufacture

3. Factory Testing and Certification:

- a. DC Resistance Test – Conductor DC resistance shall meet the requirements of ICEA S-68-516.
- b. AC and DC Voltage Tests – Each reel of cable shall be subjected to AC and DC tests in accordance with Part 6 of ICEA per the cable rated voltage for 133% insulation level. The cable shall be given a five (5) minute AC voltage withstand test and fifteen (15) minute DC voltage withstand test.
- c. Insulation Resistance – Insulation resistance shall be measured and recorded in megohms per 1,000 ft. and when corrected to 15.6°C the series insulation resistance shall not be less the 50,000 megohms per 1,000 ft.
- d. Corona Discharge – Each reel of cable shall be given a corona discharge test. The test shall be in accordance with AEIC No. CS-6, latest edition. An X-Y recording graph shall be furnished showing corona test results. The maximum partial discharge allowed is 5 pico coulombs.
- e. Certification – For each reel of cable, a certified and notarized factory test report, reel numbers for cable identification with date of manufacturer and testing shall be submitted. Nine (9) copies of this certification and test report shall be submitted through the construction Project Manager for approval.

B. XLP Cable:

1. General:
 - a. Scope – This specification covers single conductor, cross linked polyethylene insulated, shielded and jacketed power cable for use at 5,000 or 15,000 volts, 133% insulation level. Cable shall be rated at 90°C for normal operation; 130°C for emergency overload conditions; 250°C for short circuit conditions. Cables shall be UL listed and designated MV-90 in accordance with the National Electric Code.
 - b. Standards – The cable shall meet or exceed the industry standards of the latest edition of ICEA-NEMA Standard S-66-524, WC-7 and AEIC Standard CS-5.

2. Cable:
 - a. Basic Construction – Cable shall have a single Class 'B' stranded bare copper conductor, extruded semi-conducting conductor screen, cross-linked polyethylene insulation, extruded semi-conducting insulation screen, copper drain wire shielding and extruded PVC jacket. The cable conductor screen, insulation and the insulation screen shall be manufactured by employing an in-line triple tandem extrusion process.
 - b. Conductor – Annealed copper with concentric lay Class 'B' stranding conforming to ASTM B 8 and ICEA S-66-524, Part 2.
 - c. Conductor Screen – Extruded layer of semi-conducting cross-linked polyethylene compound shall be applied over the conductor. The DC volume resistivity of the screen shall not exceed 50,000 ohm/cm at 90°C when tested in accordance with AEIC No. CS-5. The conductor screen shall be clean stripping from the conductor and inseparably bound to the overlying insulation.
 - d. Insulation – Cross-linked polyethylene with physical and electrical characteristics that comply with the requirements of ICEA Standard S-66-524. The insulation thickness shall be as follows for 133% insulation level.

5 KV	-	90 Mils
15KV	-	220 Mils

The thickness at any cross-section of the insulation shall not be less than 90% of the specified thickness.
 - e. Insulation Screen – Extruded layer of semi-conducting cross-linked polyethylene compound shall be applied over the insulation. The DC volume of resistivity of the screen shall not exceed 50,000 ohm/cm at 90°C when tested in accordance with AEIC No. CS-5. Average thickness shall be in accordance AEIC.
 - f. Metallic Shield – Soft drawn uncoated copper wires helically applied over the insulation shield. The drain wire shield shall meet the requirements of ICEA S-66-524, Part 4 and UL 1072; minimum of 5,000 circular mils per inch of insulated conductor diameter. A non-metallic separator tape shall be helically applied over the metallic wire shield.
 - g. Cable Jacket – Polyvinylchloride jacket meeting the physical requirements of ICEA. The jacket shall have a minimum average thickness in accordance with ICEA S-66-524.
 - h. Identification – The following information shall be permanently printed every 24" on the surface of the jacket.
 - 1) Manufacturer
 - 2) Conductor Size and Type
 - 3) Insulation Type and Thickness
 - 4) % Insulation Level
 - 5) Rated Voltage
 - 6) MV-90
 - 7) Year of Manufacture

3. Factory Testing and Certification:
 - a. DC Resistance Test – Conductor DC resistance shall meet the requirements of ICEA S-66-524.

- b. AC and DC Voltage Tests – Each reel of cable shall be subjected to AC and DC tests in accordance with Part 6 of ICEA per the cable rated voltage for 133% insulation level. The cable shall be given a five (5) minute AC voltage withstand test and a fifteen (15) minute DC voltage withstand test.
- c. Insulation Resistance – Insulation resistance shall be measured and recorded in megohms per 1,000 ft. and when corrected to 15.6°C the series insulation resistance shall not be less than 50,000 megohms per 1,000 ft.
- d. Corona Discharge – Each reel of cable shall be given a corona discharge test. The test shall be in accordance with AEIC No. CS-5, latest edition. An X-Y recording graph shall be furnished showing corona test results. The maximum partial discharge allowed is 5 pico coulombs.
- e. Certification – For each reel of cable, a certified and notarized factory test report, reel numbers for cable identification with date of manufacture and testing shall be submitted. Nine (9) copies of this certification and test report shall be submitted through the construction Project Manager for approval.

C. Field Testing:

1. General:

- a. Scope – Field testing cables, splices and terminations shall consist of a non-destructive, direct current, dielectric test for insulation of primary cable system using ICEA standard procedure.
- b. The Electrical Contractor shall notify the Department two (2) weeks prior to the date of tests. Tests must be witnessed by representatives of the Department.
- c. Testing shall be by an independent testing firm acceptable to the Department. Testing is not to be by the Electrical Contractor. All tests shall be made by a qualified field technician especially trained for dielectric testing and interpretation of results and regularly engaged in dielectric testing.
- d. The Electrical Contractor shall be responsible for disconnecting and reconnecting existing equipment as required to make these tests.
- e. If at any time during the test procedure, the test is stopped due to excessive readings, the installation shall be checked to locate the problems. Corrective measures shall be taken prior to continuing the test.

2. Cable, Splicing and Termination Testing:

- a. Scope – All new cables, including all splices and termination, shall be tested after installation prior to being energized. All cables not under test shall be properly grounded and tied to the shield of the cable under test. If it is necessary to repeat a test, the capacitance and absorption current shall be discharged by grounding the conductor for sufficient time to allow complete drainage. If the cable has been energized prior to testing, the capacitance shall be completely discharged by grounding the conductor in an approved manner.
- b. Field Testing – Tests performed and recorded shall be of the following types:
 - 1) Step Voltage Tests for New Cable Circuits
 - 2) Step Voltage and Time Resistance (Polarization Index) Tests for Existing Circuits
- c. An installation having only new cable, splices and termination shall be tested as follows:
 - 1) 5 KV System – Test to 25 KV DC
 - 2) 15 KV System – Test to 55 KV DC* (*64 KV DC for cable only)
 - 3) Under no circumstances is the test voltage to exceed 80% of the manufacturer's original DC over-voltage acceptance test
- d. An installation consisting of a combination of new and existing cables, splices and terminations shall be tested as follows:

- 1) 5 KV System – Test to 20 KV DC provided the existing system passes the meggar test
 - 2) 15 KV System – Test to 35 KV DC provided the existing system passes the meggar test
 - 3) Lower test voltages may be used upon direction from the Client Agency or the Department
 - 4) Under no circumstances is the test voltage to exceed 60% of the manufacturer's original DC over-voltage acceptance test
- e. The results shall be plotted in the form of a curve on kilovolt-megohm paper.
 - f. In the step voltage tests, voltage shall be applied evenly to the insulation in ten (10) consecutive steps of a specified magnitude or steps equal to the kilovolt rating (whichever is the lower), starting at a pre-selected and specified initial value. Voltage shall be held at each step for one (1) minute and current readings shall be taken and recorded at the end of each one (1) minute period for each voltage step. For certain very long cables, the test current will not have stabilized at the end of one (1) minute. In these cases, each step shall be held for two (2) minutes or for sufficient time to allow for stabilization of the capacitance and absorption currents. In conducting the test, the voltage shall not be increased or decreased during the time period. At the completion of the step voltage test and when the maximum specified voltage is achieved, the voltage shall be held at this maximum for ten (10) minutes and current readings taken and recorded.
 - g. In the Polarization Index Test, a specified constant test voltage shall be applied for ten (10) minutes to each conductor, recording insulation resistance at 1/4, 1/2 and 3/4 and one (1) minute and every minute thereafter. The Polarization index (ratio of ten (10) minute insulation resistance to one (1) minute insulation resistance) shall be at least 1.00 to permit application of high potential in the step voltage test.
3. Test Results:
 - a. Determination – A determination is to be made by the testing firm field technician as soon as the test is completed, as to whether or not the system should be energized.
 - b. Distribution – Nine (9) certified copies of the field test reports shall be furnished to the Professional through the construction Project Manager for approval, and shall include the following:
 - 1) All readings shall be recorded and plotted on kilovolt-megohm paper
 - 2) A written summary by the tester as to the conditions of the installation, and recommendations relative to the acceptability of the installation.
 - c. In the event that the Department concludes that the test results are marginal, another test shall be run prior to the expiration of the one (1) year bonding period. The test shall be arranged for and paid for by the Electrical Contractor.

SECTION 916 - GUIDELINES FOR VERTICAL TRANSPORTATION SPECIFICATIONS

916.1 PURPOSE. To specify construction materials, methods and contract requirements, determined to Professional to suit the project under design.

916.2 CONSTRUCTION CONTRACT. Generally, the elevator construction would fall within the General Construction (.1) contract; however, when the extent of the elevator work is large, the Department may determine that the elevator construction shall be a separate Prime Contract.

916.3 APPLICABLE CODES AND REGULATIONS. Elevator, escalator, dumbwaiter, chair lift, etc., design shall comply with the latest editions of applicable codes:

- A. Safety Code for Elevators and Escalators
- B. Chapter 405 of the PA UCC "Elevators and Other Lifting Devices"

- C. National Electrical Code – NFPA 70
- D. Pennsylvania Uniform Construction Code (PA UCC)
- E. Accessibility Codes: ADA, UCC (IBC and IEBC 2012 Chapter 11) and ICC/ANSI A 117.1 - 2009
- F. City and Local Codes, as applicable
- G. Other codes and/or regulations as applicable

916.4 DESIGN AND SPECIFICATIONS. The following items shall be incorporated into the design and appropriate section of the specifications, as applicable.

- A. Installation shall comply with accessibility requirements for the individuals with disabilities.
- B. Specify emergency power for all passenger elevators in hospitals, and other buildings requiring same by code.
- C. Specify battery or standby power in buildings not required to have same, when directed to do so by DGS at the request of the Client Agency.
- D. Specify electrically-operated lowering devices for hydraulic elevators when the elevators are not connected to a battery or standby power source.
- E. Specify fireman’s control, when required by code.
- F. Specify emergency lighting in all elevator cars.
- G. Specify telephones in all elevators.
- H. Specify smoke detectors and interconnection to fire alarm system of all elevators. Specify that smoke detectors shall be installed at the top of each elevator shaft and in the elevator machine room.
- I. Specify coordination with the HVAC Contractor to provide ventilation and heating of elevator machine rooms.
- J. Specify that hole-less elevators are not acceptable under this specification. (Note: With special permission from the BOPC, hole-less elevators may be specified. This must be determined prior to preparation of the specifications.)
- K. Specify coordination with Electrical and Plumbing contracts to ascertain that elevator pit lighting, switching, receptacles and sump pump provisions are made. No sump pumps are permitted for hydraulic elevators.
- L. Certificate of Operation:
 - 1. UCC Elevator Permit Application (UCC – 21 Part A): For the purpose of the application, the .1 Contractor or Elevator Contractor shall identify the “Owner” and the owner’s address as follows:
 - a. Department Buildings: DGS Facilities Management Director’s Office, North Office Building 414, Harrisburg, PA 17120.
 - b. Client Agency Buildings: Client Agency representative and the address of the actual building in which the permitted improvements are to be installed.

SECTION 917 - HAZARDOUS MATERIALS SPECIFICATIONS

917.1 PURPOSE. Based on past project experience, the Department has developed the “Protocol Regarding Asbestos, Lead, PCB’s/Mercury, Radon and Other Hazardous Materials”, which includes guidance specifications for handling of hazardous materials.

917.2 GUIDANCE SPECIFICATIONS. When permission is granted by the Department to use the 5-digit spec numbering system, the Professional shall locate all hazardous materials specifications in Division 17 (immediately following Division 14) of the Project Manual. The Department’s Protocol and Guidance Specifications for hazardous materials work include the following, a copy of which can be found as Exhibit H1, HazMat Protocol, included in e-Builder.

- A. Professional's Responsibilities To The Department
- B. Sample Hazardous Materials Survey RFP Letter
- C. Sample Quality Assurance Hazmat Monitoring RFP Letter
- D. Guidance Spec for Removal of Asbestos-Containing Materials*
- E. Guidance Spec for Disturbance of Lead-Containing Surface Coatings*
- F. Guidance Spec for Removal/Disposal of PCB and Mercury-Containing Materials*
- G. Guidance Spec for Radon Testing and Mitigation Design*
- H. Lead-Based Paint Guidance Note for Drawings*

* Sections D through H are available upon request; contact the DGS Design Manager.

917.3 EDITING. These specifications are provided for guidance only, and should not be copied verbatim. Edit specifications accordingly to suit project scope and field conditions. All guidance documents are provided to indicate the level of detail that the Department is expecting in the Construction Documents. The use of competent qualified individuals should be used for design.

SECTION 918 - BUILDING PLAQUE

918.1 DGS PLAQUE. Unless the requirement has been waived in the Special Conditions of the Agreement, all Projects, including new and renovation projects, shall include a standard cast aluminum DGS building plaque, as per Exhibit E5, Standard Plaque Detail, included in e-Builder. The Professional shall include the plaque detail and specifications in the Construction Documents. Consult the Client Agency for exact location of the plaque, and indicate location on the Drawings.

CHAPTER 10

DGS STANDARD DESIGN PRACTICES

SECTION 1000 - GENERAL

1000.1 PURPOSE. This Chapter provides information concerning design and drawing standards adopted by DGS as standard for Public Works projects. This section in no way limits the responsibilities of the Professional and its Consultants stated or implied elsewhere. Commonwealth buildings must be designed and constructed with integrity, and substance to perform satisfactorily for a protracted length of time, and materials and methods must be selected accordingly. For existing facilities, conduct a thorough survey of current conditions prior to start of design for all Architectural and Engineering disciplines.

1000.2 BUILDING LIFE EXPECTANCY. The anticipated life expectancy for new DGS buildings is as follows:

- A. Monumental Buildings: Those buildings in the Main Capitol Complex or similar monumental areas in other locations - - 100-year life expectancy.
- B. Highly Significant Buildings: Those buildings on campuses or state system and PASSHE locations costing over 20 million dollars - - 75-year life expectancy.
- C. Standard Buildings: For most other Agency projects - - 50-year life expectancy.
- D. Utilitarian/Storage Buildings, Simple Repairs or Additions to Existing Structures: As designed - - 30-year life expectancy.

1000.3 ACCEPTABLE DGS PRACTICES. The practices included are both those written by DGS and standards referenced from other agencies. It is not the intent of this Manual to furnish a complete and up-to-date list of all acceptable industry standards. Questions should be discussed with the Design Manager.

1000.4 DESIGN RESTRICTIONS. See Chapter 2 for restrictions placed on design, in addition to the standards included in this Chapter.

1000.5 STANDARD SPECIFICATIONS. See Chapter 9 for DGS standard provisions and specification requirements.

1000.6 FINAL CONNECTIONS OF EQUIPMENT. The General Contractor furnishes and installs architectural equipment including kitchen, laboratory, hospital equipment, laundry equipment, systems furniture, high-density storage, and other general construction items requiring utility connections. Rough-in of all services is installed by the HVAC, Plumbing and Electrical Contractors, as applicable, from "rough-in" shop drawings based on equipment catalog cuts, and approved by the General Contractor and the Professional. The following shall be accomplished:

- A. The Professional shall coordinate the final connection requirements for all trades as part of the drawings and specifications. The lack of coordination in specifications and drawings between contracts is a frequent cause for Change Orders. The Professional shall also coordinate the final connections requirements for items/systems to be furnished or provided by the Client Agency.
- B. The HVAC, Plumbing and Electrical Contractors must cross check the approved "rough-in" shop drawing with those of the other Prime Contractors, before installing any lines or services, and report conflicts and discrepancies to the Professional and General Contractor.
- C. Final connections to all plumbing services shall be done by the Plumbing Contractor.
- D. Final connections of ductwork for exhaust systems and steam and condensate connections are to be done by the HVAC Contractor.

- E. Specify that all wiring of equipment, both internal and external must be in accordance with the National Electric Code. All switches, controls and wiring integral to a specific unit or piece of equipment are to be furnished and installed by the Contractor furnishing that piece. Final connections are to be done by the Electrical Contractor.
- F. Likewise, items/equipment furnished and installed by the HVAC, Plumbing and Electrical Contractors which require utility services/connections of other trades shall be accomplished as described above, in a similar manner, with rough-ins and final connections by the appropriate trade.

SECTION 1001 - ARCHITECTURAL

1001.1 SPACE ECONOMY. The net-to-gross floor area ratio for each floor of new buildings is to be provided with the Schematic Design Submission and the Design Development Submission.

- A. The DGS standard net space allotments appear in Chapter 13. These allotments are a guide. Idiosyncrasies of each space must be considered.

1001.2 LANDSCAPING. Landscaping, including trees, shrubs and other improvements, are a legitimate part of the design and construction, if within the Base Construction amount. Its extent must be judged against the programmed space cost and intent of the Project. Grading and seeding are the minimal accepted improvements.

1001.3 ROOF DESIGN. Roof designs must provide a positive slope to roof drains of at least 1/4" per foot. Crickets and similar fabrications shall be employed to eliminate ponding in valleys. In this regard:

- A. Achieve the minimum slope by sloping the structural framing system, or justify other methods such as tapered insulation.
- B. Roof drains are to be 4" minimum, unless justified otherwise, and are furnished by the Plumbing Contractor, and set and flashed by the General Contractor. Rainwater conductors, including connection to the drain, are by the Plumbing Contractor. Insulation of the underside of the roof drain is by the Plumbing Contractor, along with the RWC insulation.
- C. Provide secondary drainage system, as required by Code.
- D. The roof system, including structure, deck and roofing materials must be designed to resist a 90-mph wind speed, as indicated on the Basic Wind Speed map in the UCC/IBC. The Professional shall check with the Client Agency to see if the Client Agency or its insurance carrier requires design for a higher wind speed than required by code. Requirements must be noted on the drawings and in the specifications.

1001.4 ROOF DECK. Metal roof decks, new or existing, shall not be used for suspension or support of ductwork, conduit, ceiling systems, lighting fixtures, or any other miscellaneous equipment or items.

- A. All suspended items shall be supported from the structural members or a suspension system supported by the structural members. Include the above provisions in the contract specifications.
- B. When ponding occurs because of design of secondary drainage system, the ponded water load should be included in the live load.

1001.5 BUILDING JOINTS. Expansion joints and control joints are required in partitions, walls, and floors to control cracking. These must be specified and shown on the drawings. Expansion joints in exterior walls are to have a mechanical weatherstop, in addition to any compressible sealant used.

- A. Structural members must be permitted free movement. It is preferred to keep the main structural members within the building insulation envelope to minimize its expansion and contraction.

1001.6 FINISH CARPENTRY. The Quality Standards of the Architectural Woodwork Institute (AWI) are to be used for designing and specifying custom woodwork, cabinetry and finish carpentry.

1001.7 WINDOWS. The standards of the American Architectural Manufacturers Association (AAMA) are to be used for designing and specifying aluminum windows. Specific trade requirements and standards will govern for other types of windows. All metal windows shall incorporate a thermal break. All windows shall have insulating glass. All operable windows shall have insect screens.

1001.8 LIGHTING USE. Standards of design for illumination shall be Lumens per Watt for equipment selection, except where special effect is sought.

1001.9 FIRE EXTINGUISHERS. Fire extinguishers needed for occupancy of the Project (whether in cabinets or wall-hung) are included in the construction project.

- A. Bubble-face cabinets are preferred to flush or surface mounted cabinets.
- B. Extinguishers are to be the type and size recommended by NFPA 10, Portable Fire Extinguishers. Fire extinguishers shall bear the label of UL or FM, as required by the Client Agency's insurance provider.

1001.10 PROVISIONS FOR FUTURE RADON PROTECTION. All new buildings and additions to existing buildings shall include the following minimal cost features for radon protection. The following features should be included as recommended in EPA/625/R-92/016 dated January 1993:

- A. Use a minimum 4" layer of #57 stone with a vapor barrier under all basement slabs on grade. Minimum vapor barrier thickness is 10 mils, and vapor barrier sheeting shall be taped where overlapped and shall extend wall-to-wall with sealant at perimeter walls.
- B. If basement walls are made of concrete block they should be selected for minimum porosity and filled solid.
- C. Where crawl spaces occur, install a vapor barrier over the earth and seal all floor penetrations.

1001.11 SIGNAGE. Design and documentation of exterior and interior signage is part of Basic Services, and signage is to be included in the construction project to the following extent:

- A. All exterior building and site signage.
- B. Interior wayfinding signage and room signage needed to meet applicable code requirements, at a minimum.

1001.12 BOLLARDS. For protection from standard vehicle traffic, bollards shall be minimum 8" diameter concrete-filled schedule 40 steel pipe. Where heavy trucks are involved, increase to minimum 10" diameter.

1001.13 INTERIOR DESIGN. As part of Basic Services, the Professional shall design furniture/equipment layout, as required to enable location of wall receptacles, etc. In addition, the Professional shall assist the Client Agency/Institution with product, texture, pattern and color selections to accomplish an integrated interior design scheme.

SECTION 1002 - CIVIL

1002.1 CIVIL. Site design shall be by a Civil Engineer Licensed as a Professional Engineer in the Commonwealth of Pennsylvania. Comply with all codes, and federal, state and local regulations and obtain required design approvals. Information to be provided shall include, but not be limited to:

- A. Drawings:
 - 1. Existing site plan with all above ground and underground improvements, property line metes and bounds if the site borders property lines, and site demolition, indicated and described in detail. Locate and describe two (2) or preferably three (3) benchmarks, and indicate the source, datum and date of the survey. Note PA One Call design notification serial number.

2. Site improvements indicating all visible surface improvements. Provide building layout dimensions from control points. Locate the Limit of Contract Line and the Contractor staging and parking areas.
 3. Grading and drainage with existing and new contours, existing and new building floor elevations and spot grades to allow construction. Show stormwater management system. Show all drainage and sanitary sewer structures with invert and top elevations; provide profiles with pipe types, sizes, slopes and crossings indicated.
 4. Utility drawings showing the General Construction work in detail and lines of other Contractors for general site coordination with reference to their drawings for construction.
 5. Landscaping drawings.
 6. Soil erosion and sedimentation control plan drawings, and narrative.
 7. Details of all work with section cuts on plans.
- B. Specifications: The Civil Engineer shall write or review the specification sections governing all work that he has designed. Where specifications sections are provided in Division 32 for work (such as concrete paving) which is a sub-category of the main category subsequently specified (Concrete, in Division 03) they shall be fully coordinated, so that requirements of the main specification are required by reference.

SECTION 1003 - STRUCTURAL

1003.1 STRUCTURAL. Structural design shall be by a Professional Engineer, licensed in the Commonwealth of Pennsylvania.

- A. General: Design all primary and secondary structural elements and comply with all requirements of the Pennsylvania UCC. Major regional Commonwealth office buildings, potentially subject to future change of use, are to be designed for live load of 125 psf. Where renovating an existing building, the structural adequacy shall be analyzed for code compliance.
- B. Drawings: Coordinate with the Architect and verify that all architectural details reflect structural design. Provide design notes with design load criteria and notes on all structural systems. Information shall be provided on drawings, which includes but is not limited to:
1. Foundation Systems: Following the recommendations of the Geotechnical Engineer Consultant, provide a complete design of foundation systems. Fully define the work, providing bearing elevations necessary to establish a clear scope of work for bidding. Consider ground water conditions and accommodate foundation drain and waterproofing systems. Drilled piers requiring inspection are to be a minimum of 30" diameter.
 2. Concrete: Design in accordance with applicable current ACI specifications.
 3. Structural Steel: Design in accordance with applicable current AISC specifications.
 4. Steel Joists: Design in accordance with applicable current SJI specifications.
 5. Steel Deck: Design in accordance with applicable current SDI specifications.
 6. Cold-Formed Steel Framing: Design in accordance with applicable current AISI specifications.
 7. Masonry: Design in accordance with applicable current ACI specifications.
 8. Wood framing: Design in accordance with applicable current NDS specifications.
 9. Other Systems: Other structural systems shall be designed in accordance with requirements of stated applicable specifications required by Code or, where no code governs, by engineering judgment.
- C. Specifications: The Structural Engineer should write or review the specification sections governing the work he has designed. The Specifications, not the Drawings, are to contain testing requirements. Tests and inspections to occur are to be listed in Sections 014000 and 014010; clarification/details should be included in the technical sections. See Chapter 13 and the Exhibits included in e-Builder.
- D. Performance-Specified Structural Systems: All structural systems and/or components are required to be designed by the Professional's structural engineer, unless the structural element or component is permitted by DGS to be designed by the Manufacturer or the Contractor.

1. If a structural system or component is selected, where the manufacturer or contractor provides the design, instead of the Professional's structural engineer, it must meet the following criteria:
 - a. The system must be selected because it is superior to other systems in quality, longevity, efficiency, cost or other features innate to the system. It is not to be selected simply to avoid the effort of design.
 - b. The Professional may base its design on that of a specific manufacturer/supplier of its choosing, and document that design on the Drawings and in the Specifications, as the "Basis of Design". The design must be detailed sufficiently by the Professional to clearly indicate intent and functionality. Other manufacturers are to be permitted only to substitute their technology, without changing the design configuration shown, unless specifically permitted.
 - c. The system used as the "Basis of Design", and the equals named in the specifications, must be available to all bidders. At least three (3) manufacturers/suppliers must be specified.
 - d. The design criteria and loads must be fully defined in the Contract Documents, including specifics on locally applied loads. The system must be designed using best design practices and comply with all codes and regulations.
 - e. The system is not to be selected unless the Project structural engineer is capable of checking the manufacturer's shop drawings for structural adequacy, and when shop drawings are processed the Project structural engineer must state that he has approved the design of the manufacturer and checked it for structural adequacy. The Professional's approval need not be based on more analysis than he deems necessary to make this statement.
 - f. Where there is an industry association which exercises quality control over its members, membership shall be required.
 - g. The manufacturer's design engineer must be licensed in the Commonwealth of Pennsylvania.
 - h. If the system is a complete building system, the specified system and its equals must be available to all bidders.

2. The following structural systems or components may be delegated to the Contractor for design and detailing, provided that the structural system or component is sufficiently detailed on the Contract Documents, structural design loads are provided on the Contract Documents, preliminary structural calculations are performed (and provided to DGS for review) to ensure project viability, and the following additional conditions are met:
 - a. Pre-Engineered Metal Buildings:
 - (1) Pre-engineered metal building may be delegated to the Manufacturer or Contractor provided that the building foundations are designed by the Project structural engineer.
 - (2) The Contract Documents must adequately show column locations, lateral framing system concepts with available locations, frame sections, secondary member depths/widths, and other design requirements.
 - (3) Building column loads shall be estimated by the Professional and the foundations must be designed for the estimated building loads during the Project design. Provide building foundation calculations for review by DGS during the Project Design Stage. The foundations shall be checked for actual building loads during the shop drawing review stage.
 - (4) The foundations must not rely on the concrete slab on grade for lateral stability of the piers/footings supporting the metal building columns.
 - (5) The Contract Documents must indicate the required design loads (including any additional concentrated loads from building systems or occupant loading). Under no circumstances shall any loads be supported from the cold-formed secondary elements. All building system framing must be supported by either the structural

steel building columns or independent structural steel support framing isolated from the building.

b. Structural Steel Connections:

- (1) If structural steel Fabricator is allowed to select or complete the Connection details, the following information shall be provided in the structural Design Drawings (per AISC 303-05):
 - (a) Any restrictions on the types of Connections that are permitted;
 - (b) Data concerning the loads, including shears, moments, axial forces and transfer forces, that are to be resisted by the individual members and their Connections, sufficient to allow the Fabricator to select or complete the Connection details while preparing the Shop and Erection Drawings;
 - (c) Whether the data required in (b) is given at the service-load level or the factored-load level; and,
 - (d) Whether LRFD or ASD is to be used in the selection or completion of Connection details.
- (2) When the Fabricator selects or completes the Connection details, the Fabricator shall utilize the requirements in the AISC Specification and the Contract Documents and submit the Connection details to the Professional for approval.

c. Stairs:

- (1) Stringers, risers, treads, supports, landings, handrails, and etc. must be sufficiently specified on the Contract Documents to convey design intent.
- (2) All stair elements (including handrails) must be preliminarily sized to confirm that sizes shown on Contract Documents are structurally capable of meeting code required design loads.
- (3) Landings (including intermediate landing between floors) must be adequately detailed (location, elevation, supports, and etc.) to show stair configuration. Structural supports (hangers, post-ups, wall supports) must be specified and detailed on the Contract Documents to convey framing concept to steel fabricator/manufacturer and to determine loads on adjacent support members.
- (4) Provide preliminary calculations to DGS for review.

d. Handrails/Guardrails:

- (1) Handrails and guardrails must be adequately detailed on the Contract Documents to convey design concept.
- (2) All handrail/guardrail elements (including posts, connections) must be preliminarily sized to confirm sizes shown on Contract Documents are structurally capable of meeting code required design loads.
- (3) Provide preliminary calculations to DGS for review.

e. Non-Load Bearing Cold-Formed Metal Framing:

- (1) The design of non-load bearing cold-formed steel framing may be delegated to the Contractor for design, provided that the entire system is designed in accordance with the Project design parameters set forth by the structural engineer of record.
- (2) The Contractor's engineer must submit signed and sealed drawings and calculations by a registered professional engineer in the Commonwealth of Pennsylvania to the Professional or Project structural engineer for design approval.
- (3) All exterior cold-formed steel framing shall have a minimum G90 galvanization, and all jamb and sill framing and sill cripples shall be a minimum of 16 gauge.

f. Cold-Formed Metal Roof Trusses / Wood Metal Plated Floor or Roof Trusses:

- (1) The Project Structural Engineer is responsible for all permanent bracing and lateral load-resisting systems for the roof framing.
- (2) Temporary Installation Restraint/Bracing and Permanent Individual Truss Member Restraint/Bracing is required to be designed by the Professional per IBC 2303.4.1.3 & IBC 2210.3.4 for trusses spanning over 60'-0" feet or greater.
- (3) Trusses must be adequately detailed on the Contract Documents including required design loadings (including snow drifting, pattern loading, etc.).
- (4) The Contractor's engineer must submit signed and sealed drawings and calculations by a registered professional engineer in the Commonwealth of Pennsylvania to the Professional or Project structural engineer for design approval.
- (5) Truss hold-downs or fasteners must be preliminarily estimated and designed on the Contract Documents for bidding purposes and verified during the shop drawing approval process.

g. Fences:

- (1) Foundations for fences must be designed by the Professional.
- (2) Posts and Horizontals must be adequately detailed on the Contract Documents to convey design concept.
- (3) All fence elements (including posts, horizontals, footings, and connections) must be preliminarily sized to confirm that sizes shown on Contract Documents are structurally capable of meeting code required design loads.
- (4) Provide preliminary calculations to DGS for review.

h. Bollards:

- (1) Foundations must be designed by the Professional
- (2) Bollards must be adequately detailed on the Contract Documents to convey design concept.
- (3) Provide preliminary calculations to DGS for review.

i. Open-Web Metal Joists

j. Engineered Wood Products

k. Structural Insulated Panels (SIP)

l. Translucent Wall and Roof Panels

m. Skylights

n. Metal Decking

o. Metal Composite Panels or (MCM)

p. Precast Concrete

q. Packaged Precast Treatment Plants: Foundations must be designed by the Professional

r. Sheet/Shoring

s. Pre-fabricated storage units: Foundations must be designed by the Professional

t. Segmented Retaining walls

2. The following structural systems or components are not to be delegated:

- a. Main Frame Load Resisting Systems
- b. Insulating Concrete Forms (ICF)
- c. Construction/Control Joint locations for concrete slabs on grade

E. Metal Stud Bearing Walls: DGS policy does not allow Commonwealth buildings to be constructed with metal stud bearing walls. However, load-bearing cold-formed metal framing for Standard Buildings (1000.2C) & Utilitarian/Storage Buildings (1000.2D) may be considered with DGS approval for small, one or two story buildings. Prior approval must be obtained during Programming or Schematic Design stages. If approval is granted, the Professional must design the gravity and lateral load resisting systems and NOT delegate the engineering/design to the Contractor. Exterior gypsum panel shear walls will not be acceptable for the lateral load-resisting system.

- F. Slabs-On-Grade within Buildings: Slabs are to be designed to allow removal and replacement, without disturbing exterior walls or the supporting structure, unless specifically authorized otherwise.

SECTION 1004 - HEATING, VENTILATING AND AIR CONDITIONING

1004.1 GENERAL. The HVAC system shall comply with all the state's UCC requirements, including ASHRAE standards and guidelines set forth herein and/or state and local codes, whichever is more stringent. Refer to Chapter 9 regarding DEP Boiler Approval Permits, and additional design and testing requirements. Refer to Chapter 2 for clarification of the division of work.

- A. The number of air changes shall conform to recommendations established by ASHRAE standards and/or the PA and local Health Department.
- B. The design and installation of air duct distribution, exhaust and return systems shall conform to requirements of SMACNA standards.
- C. Exhaust hoods for kitchens and laboratory facilities shall conform to NFPA requirements and bear the NSF seal of approval, and be UL listed or classified. Hoods shall adequately collect and exhaust air, fumes, smoke and vapors from the area in which the hood is installed. Provide outside air so that the room area is sufficiently ventilated, and maintains the required negative pressure.
- D. Locate fire dampers to conform to NFPA 90A. Fire dampers are to comply with UL 555 and be so labeled by an approved testing or inspection agency.

1004.2 STEAM AND HOT WATER HEATING SYSTEMS. All equipment used for steam or hot water heating systems shall be constructed and installed in accordance with requirements of the Department of Labor & Industry, Boiler Division and ASME Boiler and Pressure Vessel Codes.

- A. Steam and HWHS and HWHR pipes shall be steel per ASTM A 53, A 106 or A 120 Schedule 40. Condensate return pipes shall be steel per ASTM A 53, Schedule 80.
- B. All valves for hot water boilers, hot water pressure vessels, high and low pressure steam boilers and pressure reducing stations shall be marked in accordance with ASME, Boiler and Pressure Vessel Code indicating type of service, capacity of valve in BTU/hr or lbs. steam per hour and operating pressure. Pressure relief valve rating shall not exceed the maximum allowable working pressure of the boiler.
- C. Pipe joints for steel piping shall be threaded up to and including 2" diameter. Pipes 2-1/2" diameter and over shall be joined by welding or flanged fittings. Copper tubing shall be joined by brazing or soldering. For 3" diameter or larger, mechanical couplings may be used for low pressure hot and cold water systems only in accessible locations. Seals for mechanical couplings shall be designed for the specified operating and type service.
- D. Include expansion/contraction compensation features and properly support all piping to permit expansion and contraction.
- E. Piping for branches to baseboard radiation, fan coiled units and such other local heating equipment which may require servicing or replacement shall be provided with a union and a shut-off valve on each side of the device.
- F. Connections to pumps, circulator, and all other equipment which may require servicing or replacement shall be provided with a union and a shut-off valve on each side of the device.
- G. Insulate all heating and cooling system pipes within the building with the minimum thickness as prescribed by the International Energy Conservation Code (IECC). Pipe insulation and covering shall have a flame-spread rating not exceeding 25 and a smoke-developed rating not exceeding 50 in accordance with ASTM-E64.

- H. When specifying underground pre-insulated conduit systems, all related vaults/pits shall be equipped with sump pits, sump pumps, and high water level alarms. Conduit jacket shall be vented to a location visible to facility staff. Cathodic protection shall be as required by the manufacturer.

1004.3 COAL-FIRED BOILERS. If coal-fired boilers are being installed on the project, contact the Design Manager for specific requirements, procedures, and forms that must be utilized.

1004.4 INCINERATORS. Incinerators used for burning of trash or medical waste shall conform to the requirements of DEP, and/or the local Health Department. File permit applications with DEP and other regulatory agencies prior to the Design Development Submission.

1004.5 TESTING, ADJUSTING AND BALANCING (TAB) AGENCY. The services of a qualified TAB agency shall be provided by the HVAC Contractor. Such agency shall employ a Professional Engineer licensed in the Commonwealth of Pennsylvania. The TAB agency shall be certified by AABC or NEBB, and shall have a minimum of five (5) years' experience in the testing, adjusting and balancing of all water, hydraulic and air systems.

- A. The testing and recording of all data shall in general conform to standards of AABC or NEBB or as may be approved by the Professional.
- B. All TAB reports shall be certified by the testing agent and reviewed and approved by the Professional. The report shall make record of any and all deficiencies found by the testing agent prior to, during and after testing. The Professional, prior to approval, shall provide to the Bureau of Construction appropriate comments regarding such deficiencies indicating how such deficiency, if any, was corrected. See Chapter 9 for additional information, and additional requirements due to Commissioning Agents, if applicable.

1004.6 REFERENCE CODES AND STANDARDS. All codes and standards applicable to design, installation and material requirements shall be of the latest date of issue.

1004.7 GEOTHERMAL HVAC SYSTEM DESIGN. To ensure proper initial operation and ongoing serviceability, the following requirements shall be incorporated into all closed-loop geothermal piping systems.

- A. Bring each borehole piping individually back to supply and return headers in the Mechanical Room. For a very large system (over 60 boreholes), a maximum of two (2) boreholes per circuit will still allow the potential to flush dirt and debris adequately.
- B. Add shutoff/balancing valves at each header connection to allow breaking the borehole circuit for flushing.
- C. Incorporate a duplex basket strainer on the return leg from the wellfield, before the pumps.
- D. Add wording in Contract Specifications to require the Contractor to monitor the amount of grout pumped down each borehole to insure complete filling of all voids, which would impair heat transfer.
- E. Utilize, to the extent possible, two-pipe, reverse-return piping configurations for house piping from headers to heat pumps.
- F. Insulate house piping where it passes thru finished spaces, or where extremes in building temperatures could either cause condensation, or affect thermal performance of the equipment.
- G. If aqueous glycol is proposed for the geothermal heat transfer fluid, specify and design around propylene glycol rather than ethylene glycol, for environmental reasons.
- H. Install sufficient instrumentation in the geothermal piping system to enable maintenance personnel to monitor and troubleshoot individual borehole performance.

- I. The HVAC (.2) Contractor shall be responsible for installation of geothermal wellfield. This provides the Department a single point of responsibility in the event of performance issues with the system.

1004.8 HVAC WATER TREATMENT. All chemical feeders shall be provided with associated feeder filter kits.

1004.9 COOLING TOWER DESIGN. Cooling Tower make-up water lines shall be metered. The Condenser Water Supply piping shall be filtered immediately downstream of the Cooling Tower.

SECTION 1005 - PLUMBING

1005.1 GENERAL. The design and installation of plumbing systems, including sanitary and storm drainage, sanitary facilities, water supply, gas piping, fire protection, storm water and sewage disposal, shall comply with the requirements of Pennsylvania UCC and/or local municipal plumbing codes, whichever is the more stringent.

1005.2 SCOPE. The work of the Plumbing (.3) Contract is generally limited to within a point five (5) feet outside the building.

1005.3 BASIC REQUIREMENTS. The following provides basic requirements for the design and construction of plumbing systems. This guide does not supersede any state, municipal or other governing agency's codes and regulations.

- A. Toilet Fixtures:
 1. All public toilet rooms shall be provided with wall hung lavatories, urinals (for men) and water closets using appropriate fixture carriers. Private toilet rooms may use floor mounted water closets. Provisions for handicapped fixtures shall conform to all applicable codes.
 2. Lavatories shall be rectangular (20" x 18" minimum) with combination faucets and pop-up waste stoppers, except in state parks. Use screen guards in state parks.
- B. Service Sinks: The number of service sinks required in any building should be determined by the janitorial requirements and the location of the building plumbing. Sinks will be installed in a separate janitor service closet.
- C. Water Coolers and Drinking Fountains: Provide chilled drinking water in all buildings, except residences. Coolers are to be lead free in soldering and tank construction.
- D. Special Temperature Controls: Hot water for baths and showers in all hospitals, health care centers and other such Institutions shall be provided with temperature-pressure controllers, so that the delivered hot water temperature does not exceed 110°F.
- E. Emergency Showers and Eyewash Stations: Emergency showers and/or eyewash stations shall be provided and strategically located in all chemical laboratories and other facilities where individuals are exposed to chemical or fire harm. Emergency showers shall be supplied with tempered water.
- F. Materials: Unless otherwise instructed, plumbing fixtures shall conform, as a minimum, to the following indicated standards. All fixtures shall be of a water conservation type and conform to applicable codes.
 1. Toilet Fixtures: Water closets, urinals and lavatories shall be vitreous china.
 2. Service Sinks and Bath Tubs: Shall be porcelain cast iron, or as approved by the Department.
 3. Piping and Fittings:
 - a) Water Service: Schedule 40 (Type A), galvanized steel per ASTM A 53 or ASTM A 120.
 - b) Water Distribution: Copper tubing Type A or Type B per ASTM B 88.
 4. Sanitary Drainage System and Vents:

- a) Aboveground: Type A, Type B or Type D (cast iron ASTM A 74 – service weight)
 - b) Underground: Type C (cast iron ASTM A 74 – heavy weight) (Type D).
 - c) Vents: Galvanized steel (per ASTM A 53 or cast iron per ASTM A 74 light weight). Vents through roof shall not be less than 3" diameter.
5. Rainwater Conductors: Type D (cast iron ASTM A 74 light weight).
Note: Downspout and roof gutters are to be within the scope of work of the General Contractor.
 6. Storm Sewer: Refer to National Plumbing Code and/or local codes.
 7. Pipe Fittings: Malleable iron per ANSI B 16.3.
 8. Acid Waste: Shall be a separate system and shall be neutralized before entering the sanitary sewer system. Pipe shall be high silicon alloy iron, or brass pipe and fittings. Borosilicate glass pipe and fittings may be used for acid waste lines within the building only, not below grade.
 9. Vent Flashing: Coordinate with the General Contract for material required and Prime Contractor responsibility.
 10. Solder: Shall be lead free, 95/5 solders.
 11. Water and Fire Protection Piping: Mechanical fittings for pipe sizes 3" diameter or greater may be used in accessible locations, but shall not be used in inaccessible locations, above finished ceilings or light fixtures. Piping for fire protection systems shall conform to NFPA 13 and as may be modified by the Department and/or local codes.

1005.4 REFERENCE CODES. All codes and standards applicable to design, installation and/or material requirements shall be the currently applicable edition. Basic references are:

IPC	International Plumbing Code
IFC	International Fire Code
ANSI	American National Standards Institute
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
MSS	Manufacturers Standardization Society of the Valves and Fittings Industry
PDI	Plumbing and Drainage Institute
ASME	American Society of Mechanical Engineers

SECTION 1006 - ELECTRICAL

1006.1 REQUIREMENTS. Electrical design shall comply with all applicable codes, regulations and good engineering practices. Design and installation of electrical systems shall comply with the requirements of the National Electrical Code (NEC), latest edition, and the Uniform Construction Code (UCC), whichever is more stringent. Refer to Section 905.12 for a listing of Basic Codes/Regulations. It is the Professional's responsibility to verify the version of each Code followed by the Permitting Agencies involved with the Project (such as the Department of Labor and Industry and the Department of Health).

1006.2 MINIMUM DESIGN CRITERIA. Electrical design shall meet or exceed the following:

- A. Lighting levels shall use Illuminating Engineering Society (IES) recommendations as maximum and 80% of IES standards as minimum, unless directed otherwise by the UCC or the Department. Construction stage lighting shall meet OSHA, Standards for Light Levels.
- B. Voltage drop in feeders shall not exceed 2% and in branch circuits shall not exceed 3%.
- C. All specified equipment shall be designed to safety interrupt and/or carry the available fault current at the equipment. Evaluate existing systems required to determine value of short circuit at equipment.

- D. Energy conservation shall be a prime consideration in all design. Dry type transformers shall be rated 80°C rise with 40°C ambient, with copper coils. Fan cooling shall be permitted for units over 300KVA
- E. All conduits, raceways, etc. shall be equipped with a green colored insulated grounding conductor. The conduit system shall not be relied upon as the only grounding path.
- F. Set screw and die-cast fittings are not acceptable on Electrical Metallic Tubing (EMT) – use steel compression fittings.
- G. Specify security screws and device covers – always discuss need for same on DOC, DHS and DMVA projects.
- H. Light fixtures shall use ballasts and LED drivers with maximum of 10% THD.
- I. Specify 10% spare breakers and 15% additional space/bussing for future breakers in all panels including switchboards.
- J. Panelboard schedules shall follow Exhibit F6, Sample Electrical Panel Schedule, included in e-Builder, listing connected loads.
- K. Conduct a thorough survey of existing conditions. Identify Code violations and defective equipment.
- L. Coordinate electrical layouts and plans with layouts and plans of all other design disciplines for each submission.
- M. Pull strings shall be included in all empty conduits.
- N. Detail on drawings all methods of controlling spread of fire and smoke. Specify fire-rated sealants and 'poke through' fittings.
- O. Emergency lighting levels shall be in accordance with the UCC requirements. Tritium exit signs are not permitted.
- P. Maintain adequate working space around and in front of all electrical equipment. Coordinate with existing and proposed conditions.
- Q. Do not attach any electrical items to the metal roof deck. Support lighting cable and conduit independent of ceiling framing.
- R. Limit use of metal clad cables to fixture whips.
- S. Provide resistance heater strips in outside housed switchgear.

1006.3 REGULATORY AGENCY AND UTILITY COMPANY APPROVALS. The Professional must meet standards and obtain approval of the following, for the Design Development Submission, the Interim Construction Documents Submission, and the Construction Documents Submission:

- A. Emergency and Exit Lighting Systems.
- B. Fire Alarm and Detection Systems.
- C. Service Size, Location, etc.
- D. Telephone and Data Communications and Computer Service Entry and Details.
- E. Cable TV Service Entry Details.
- F. Natural Gas or Propane to Emergency/Standby Generators – Service Location.

- G. Diesel Fuel to Emergency/Standby Generators – Service Location.
- H. The approval of local regulatory agencies where required.

1006.4 IT/DATA/TELECOM. These systems typically will be included in the Project in one of two (2) ways, as described below. Confirm specific project requirements with the Design Manager.

- A. Conduit without Wiring: This system is by special exception only. Include all necessary wall outlet boxes, the conduit/ducts/trays from the wall boxes back to the IT/Data/Telecom room, and terminate inside the room. Include pull wires in conduits. Do not include jacks/outlets. Do not include any racks or equipment in the IT/Data/Telecom room. All racks and equipment in the IT/Data/Telecom room are considered “loose equipment” and are not to be included in the Project.
- B. Conduit with Wiring: This system governs all DGS projects and shall be the default design. Include all necessary jacks/outlets, wall outlet boxes, the conduit/ducts/trays from the wall boxes back to the IT/Data/Telecom room, along with the patch panel(s) and the rack that holds it (them). All cabling should be terminated and tested in accordance with the Client Agency protocol. All other racks and equipment in the IT/Data/Telecom room are considered “loose equipment” and are not to be included in the Project.

Note: Some Client Agencies or tenants may have an existing IT support contract that covers this infrastructure.

SECTION 1007 - VERTICAL TRANSPORTATION

1007.1 REQUIREMENTS. Elevator, escalator, dumb-waiter, chair lift, etc. design shall comply with the UCC, L&I, ASME, and all applicable codes, regulations and engineering standards. The Professional shall engage the services of an Elevator Design Consultant for all vertical transportation designs.

1007.2 DRAWING CRITERIA. Vertical transportation equipment shall be shown on the drawings of the various design disciplines and coordinated between all of the design disciplines, i.e., Architectural, Structural, HVAC, Plumbing and Electrical.

1007.3 REGULATORY AGENCY APPROVALS. The Contractor will obtain approval of the Vertical Transportation System(s) by all agencies having jurisdiction; however, the Professional must assure that what he designs and specifies is approvable.

CHAPTER 11

CONSTRUCTION PROCUREMENT

SECTION 1100 - GENERAL

Note: The DGS Modernization process and the use of e-Builder process management software may require revisions to the instructions to the Professional regarding the Procurement process, including all Sections of this Chapter.

1100.1 INTRODUCTION. The Construction Procurement Stage encompasses the activities from the BOPC Construction Documents Submission Approval to the Award of Construction Contracts. Specific instructions for proceeding with the Construction Procurement stage are given to the Professional following Construction Documents Submission approval. The Procurement process is considered to be part of the Design Stage Basic Services.

1100.2 ADMINISTRATION. The Bureau of Pre-Construction (BOPC) is the primary DGS project administrator during the Construction Procurement Stage. Its Bidding Support & Contract Award Division is the contact point for bidding schedule and other administration activities. Consult the Design Manager on all matters of design, construction contracts and bidding requirements.

1100.3 PROCESS. The Procurement (Bidding and Award) Process will take place in e-Builder. When the Contract Documents submission is approved, the Design Manager will upload the Drawings and Project Manual into the Bidding Documents folder in e-Builder, in PDF format. The construction period, will be based on the recommendations of the Professional and the BOC. The Project will be advertised on PA e-marketplace at www.emarketplace.state.pa.us. The major steps in the Procurement Stage are listed below.

- A. When all approvals and permits have been obtained, and all review comments have been satisfactorily addressed, and the Documents are 100% complete and ready for bidding and construction, the Design Manager approves the Construction Document Submission in e-Builder.
- B. The Design Manager uploads the approved Construction Documents (Project Manual and Drawings) to the Bidding Documents folder.
- C. The Design Manager working with the Bidding Gatekeeper establishes the date for Bid Issue, as well as the date and time for the Bid Opening.
- D. The Design Manager notifies the Professional and the Client Agency of the Bid Issue and Bid Opening dates, and gives a range of three (3) days for the Pre-Bid Conference to occur (approximately 21 days prior to the Bid Date). The Professional and the Client Agency together decide on a date, time and location for the Pre-Bid Conference, and notifies the Design Manager, who then inputs the information into e-Builder.
- E. After the Construction Documents have been approved, the Professional shall solicit proposals for Structural Quality Assurance Services, Construction Stage Geotechnical Quality Assurance Services, and Hazmat Air-Monitoring Quality Assurance Services, as applicable.
- F. The Bidding Support & Contract Award Division requests the Prevailing Wage Rates from Labor and Industry or, if federally funded, Davis-Bacon Wage Scale determinations are obtained. The Notice to Bidders, Instructions to Bidders, Form of Agreement, General Conditions to the Construction Contract, Administrative Procedures, Prevailing Minimum Wage or Davis-Bacon Wage Predeterminations, Special Conditions and the Financial Questionnaire Forms (if applicable) are uploaded to e-Builder.
- G. The Design Manager provides all the information required for bidding and the Bidding Support & Contract Award Division advertises the Project for bidding, at the PA e-Marketplace portal.

- H. Bidders visit Pennsylvania eMarketPlace portal, and follow the links provided to gain access to e-Builder to review all the bidding documents and any Addenda issued.
- I. On the Bid Date, the Design Manager electronically opens bids.
- J. The Department and the Professional evaluate the bids.
- K. The Department awards contracts or rejects bids, as applicable.
- L. If bids are rejected and rebidding is required, the Department will provide instructions to the Professional.

SECTION 1101 - SCHEDULE

1101.1 GENERAL. The bidding dates and construction completion dates provided to the Professional at the beginning of the project are tentative anticipated dates. Actual dates are established by the Department during the Construction Procurement process. The actual dates are dependent upon the Professional's recommendation (see Recommended Days of Construction, Chapter 7), the Client Agency's Occupancy Schedule, the Budget Office priority in funding and other factors, as determined by DGS. There is no set time period between Construction Documents Submission approval and bidding.

1101.2 ADVERTISING. The date for advertising to bidders and the Date of Issue are determined by the Design Manager working with the Bidding Gatekeeper. The Bidding Support & Contract Award Division places the advertisement on the Pennsylvania eMarketplace portal. The bidding period is generally five (5) weeks in length. All bidding documents in PDF format will be available as soon as the Project has been advertised through e-Builder.

1101.3 PRE-BID CONFERENCE. The Professional must advise the Design Manager of the need for a Pre-Bid Conference, at the Construction Documents Submission. The Design Manager will make the final decision, considering the Professional's and the Client Agency's recommendations. The Design Manager will coordinate the date, time and location for the Pre-Bid Conference with the Client Agency and Professional (typically three weeks prior to the Bid Date), and will advise the Bidding Support & Contract Award Division by uploading the information into e-Builder. The date, time and location of the Pre-Bid Conference will appear in the Notice to Bidders and the Advertisement.

1102.4 BID OPENING. The Design Manager sets the Bid Opening Date and Time. Only the BOPC can change the Bid Opening Date by addendum. The Professional shall advise the Design Manager of all circumstances at any time during the Construction Procurement stage that might warrant changing or extending the bid date.

1101.5 QUALITY ASSURANCE SERVICES PROPOSALS. When Structural Quality Assurance, Geotechnical Quality Assurance, and/or Hazmat Air-Monitoring Quality Assurance services are required, the Request for Proposals shall be issued during the bidding period. See Chapter 13 for further directions.

SECTION 1102 - PRE-BID CONFERENCE

1102.1 PURPOSE. Pre-Bid Conferences are scheduled for critical or complicated projects, or as determined by the Department. The purpose is to briefly present the basics of the Project to the attendees, with emphasis on the special aspects of the Project that will affect bidding and construction, such as special working hours, required sequencing of the work, etc. Administrative and technical questions about the proposed construction are received from prospective bidders. A tour of the Project site is generally included, when bidders' access is otherwise restricted. Unless otherwise determined by the Department, it is not mandatory for Bidders to attend the Pre-Bid Conference.

1102.2 WHEN AND WHERE. When it has been determined that a Pre-Bid Conference is required, the Design Manager will contact the Professional and the Client Agency and coordinate the scheduling of the date, time and location of the Conference. The Pre-Bid Conferences should occur no less than three (3) weeks prior to the Bid Opening Date.

1102.3 THE CLIENT AGENCY. The Client Agency is responsible for providing appropriate meeting space for the conference. Some Institutions, such as DOC, will have some specific requirements that need to be met ahead of time (names of attendees, etc.); coordinate with the Institution.

1102.4 THE PROFESSIONAL. The Professional must attend and chair the Pre-Bid Conference. Consultants' attendance is at the Professional's discretion. The BOPC and the BOC representatives may attend if available, but normally will not. The Bureau of Diversity, Inclusion and Small Business Opportunities (BDISBO), if represented, will explain the DGS minority participation policy and procedures.

1102.5 RESPONSE TO QUESTIONS. The Professional must make it clear to the attendees that all oral clarifications or explanations to prospective bidders during the Conference are informal and non-binding. Only clarifications and explanations addressed by Addendum are considered official. Addenda formally clarifying or amending the Contract Documents must be issued as soon as possible following the Pre-Bid Conference. All questions regarding the documents are to be submitted in writing by perspective bidders in e-Builder. Other clarifications and/or corrections of errors and omissions discovered by the Professional will also be issued by Addenda.

- A. Attendance records and minutes of the Pre-Bid Conference are to be forwarded to the Department by the Professional within two (2) days following the Conference. The Conference minutes and attendance records are not to be distributed to Conference attendees, nor are they to be issued to Bidders in an Addendum.

SECTION 1103 - MODIFICATIONS

1103.1 ADDENDA. Preparation and approval of all Addenda will occur in the bidding process in e-Builder. The Professional or the Design Manager initiates all Addenda. All Addenda approved by the Design Manager are posted in e-Builder by the Bidding Admin with the following guidelines:

- A. Post Addenda at least nine (9) days prior to Bid Opening Date.
- B. Post only after the Design Manager's authorization.
- C. Addenda must be written in the standard DGS Addendum format. A template is available within the e-Builder addendum process for addendums containing only a few items. For addendums containing many items and attachments, use Exhibit F7, Sample Addendum included in e-Builder and upload the document and attachments when initiating the e-Builder addendum process. Refer to the process training guide in e-Builder for more detailed instructions.

1103.2 "EQUAL" PRODUCTS AND SUBSTITUTIONS. Requests for Approvals of "equal" products/systems, or for "substitutions" are not considered until after award. Bidders are to bid the work as specified.

1103.3 CONTRACTOR QUALIFICATION. Contractors and/or subcontractors are not pre-qualified, or approved prior to receipt of bids. For certain types of projects and only in very rare instances when the Pennsylvania Historical and Museum Commission is the Using Agency, the PHMC may request pre-qualification of the Contractors. If a request is made for pre-qualification discuss the matter with the Portfolio Manager and the Director. In most other cases, required qualifications can be included in the applicable technical specification section. The evaluation process takes place after Award.

SECTION 1104 - BID OPENING/AWARD

1104.1 BID OPENING. Web Conference Link for Public Bid Opening can be found on the DGS website www.dgs.pa.gov > Businesses > Design & Construction > Bidding and click Bidding Opportunities and select the appropriate project. Please note, only the moderator of the Web Conference will have audio enabled, all participate lines will be muted. Please be advised that the Bid Opening will occur close to but no sooner than the specified bid opening time noted. Each contract point will stay viewable for no less than 5 minutes.

1104.2 EVALUATION. The DGS Legal Office and the BOPC evaluate the Bids. The acceptance of the bid and award of contracts is the sole decision of the Secretary of the Department of General Services or the

Deputy Secretary for Public Works. A tabulation of the Bids is displayed after the bid opening on the DGS website www.dgs.pa.gov.

1104.3 TIME. Bids are good for sixty (60) days. Any extension of time will be requested by the DGS Legal Office or BOPC.

1104.4 QUALITY ASSURANCE SERVICES AWARD. The Professional shall not award Quality Assurance Services work or other construction-related contracts before construction contracts are awarded and approval is given by the Department. See Chapter 13, for more information.

SECTION 1105 – REBIDDING AND REVISED REBIDDING

1105.1 CAUSES. Projects may be rebid when all bids received in the initial bidding exceed the Base Construction Amount, when bids are not responsive or responsible, or for other reasons at the Department's discretion. If substantial changes are required to the documents, it may be termed a Revised Rebid. Instructions for rebidding or revised rebidding will be issued by the Department.

1105.2 DOCUMENTS. The Department will advise the Professional if any design or document modifications are required. Incorporate all Addenda issued during the initial bidding period into the revised contract documents, by Addendum. Mark all documents (Project Manual Cover, Drawing Cover Sheet, etc.) with the word "REBID" or "REVISED REBID", followed by the new issue date.

1105.3 ADMINISTRATION. Rebidding, advertising, and all other administration follows the same procedures prescribed for the initial Construction Procurement Stage. DGS will reimburse the Professional for rebidding costs when the rebid was not caused by Professional error, which may include the low bids exceeding the Base Construction Amount.

CHAPTER 12

CONSTRUCTION CONTRACT ADMINISTRATION

SECTION 1200 - GENERAL

1200.1 GENERAL. The Professional's activities during the Construction Contract Administration Stage are presented in general terms. This Chapter should be used in concert with the Professional Agreement, the BOC's Administrative Procedures, and the General Conditions to the Construction Contract.

1200.2 OVERVIEW OF RESPONSIBILITIES. The Construction Contract Administration Stage commences with the issuance of a Letter of Intent, or a Notice of Award of construction contracts. The Professional shall administer the Construction Contracts and review the Contractors' work for compliance with the Contract Documents, including the Construction Contract, General Conditions, and the BOC's Administrative Procedures. The scheduling of the Final Inspection shall certify that the contract work is substantially complete and ready for final inspection and final payment. The Professional shall then revise the original Contract Documents to reflect all changes recorded during the course of construction. These revised drawings shall be uploaded to e-Builder and be identified as "Record Drawings".

1200.3 ADMINISTRATION. The Bureau of Construction is the lead DGS project administrator during the Construction Stage. The BOC administers projects from four (4) Regional Offices, which are supervised by Construction Regional Director for each Region. The Project Manager or Assistant Project Manager (as designated), from the Regional Office is the prime contact for the Professional and the Contractors. The Department may, at its discretion, appoint a full-time independent Construction Manager to oversee the Construction Administration.

Note: The DGS Modernization process and the use of e-Builder process management software may require revisions to the instructions to the Professional regarding the Administrative Procedures during the Construction Stage.

1200.4 ROLE OF THE BUREAU OF PRE-CONSTRUCTION. The BOPC Design Manager serves as an assistant to the BOC during construction and as the contract manager for the Professional Agreement. The BOPC should be copied on all design-related correspondence, except shop drawings and product/material submittals.

1200.5 JOB CONFERENCES. The BOC PM or APM chairs regular bi-weekly Job Conferences at the site. Attendance of all Contractors and the Professional is mandatory at all Job Conferences, whether it is a regularly scheduled bi-weekly conference or a special meeting called for by DGS. In this regard:

- A. The Initial Job Conference generally is held within thirty (30) days of the execution date of the construction contracts. On-site work begins within ten (10) days following the Initial Job Conference.
- B. The Professional shall fully familiarize itself with the appropriate General Conditions to the Construction Contract and the Administrative Procedures prior to the Project Initial Job Conference.
- C. An Orientation Meeting is held in advance of the Initial Job Conference when DGS wants to orient a new Contractor and/or Professional to DGS procedures and forms.

1200.6 SPECIFIC TASKS. The Bureau of Construction's (BOC's) Administrative Procedures details the timing and process of administrative tasks and the distribution of documents and correspondence. The BOC's Administrative Procedures are available on the DGS website and in e-Builder.

SECTION 1201 - PROJECT REPRESENTATION

1201.1 BASIC SERVICES. The Professional shall visit the project site at least bi-weekly for regular Job Conferences during periods of construction. In addition to bi-weekly visits to project sites, the Professional is required to attend, at the request of the BOC PM or APM, any/all project site conferences that may be necessary

to clarify the Contract Documents. Refer to “Construction Contract Administration” within the Professional Agreement for this and other tasks to be accomplished by the Professional during the Construction Contract Administration Stage. The Professional Agreement stipulates the number of meetings that are included in the Basic Services.

- A. In addition to attending meetings, the Professional is required perform “site visits” as necessary to evaluate the work, and shall visit the site at intervals appropriate to the stage of construction, to become generally familiar with the progress and quality of the portion of the project completed, and to determine, in general, if the work observed is being performed in compliance with the Contract Documents and in a manner indicating that the work, when fully completed, will be in accordance with the Contract Documents.

1201.2 CONSULTANTS. It shall be the duty of the Professional to have its Consultants visit the project site periodically during their respective disciplines’ period of active construction, at least monthly, or at such intervals as required by DGS to ensure the progress and quality of the work and to determine if work is proceeding in accordance with the Contract Documents.

1201.3 REPORTS. The Professional must prepare a written report of each site visit, and submit to the Bureau of Construction within three (3) calendar days after each visit by the Professional or its Consultants.

1201.4 QUALIFICATIONS. The Professional’s Representative (full time or not) must be qualified by training and experience to make decisions and interpretations of the Construction Documents. The Professional will submit resume(s) of Representative candidates to the Director of the BOC for approval in advance of the beginning of the Construction Stage. Registered Architects or Professional Engineers are preferred, but others are acceptable depending on qualifications for the Project. The Department reserves the right to request the replacement of any Project Representative assigned to the Project who is not performing satisfactorily.

1201.5 FULL TIME ON-SITE REPRESENTATION. When recommended by the Professional and/or deemed necessary by DGS, full time on-site representation for the construction period is included in the Professional Agreement (Basic Services) or as an Additional Service. DGS will review and approve the qualifications of candidates for the position of Full Time On-Site Representative and will request additional candidates, if necessary. The scope of the tasks that the Full Time On-Site Representative is to perform will be described in detail at the time the services are requested and negotiated. The Professional will only be entitled to additional compensation for tasks over and above those already included in the Professional’s Basic Services.

1201.6 OVERRUN PERIOD. The Professional is required to continue Construction Administration Services to the date of the last Final Inspection of all construction contracts, even when it occurs after the period of scheduled construction, as specified in the Construction Contract Documents. When the Professional is not at fault, the Professional will be compensated for Construction Administration Services beyond the scheduled contract completion date, in accordance with the Professional Agreement. Full Time On-Site Representation, if required during the Overrun Period, will be negotiated as an Additional Service, in accordance with the General Conditions to the Agreement for Professional Services.

1201.7 CONTRACTORS’ EXTENSIONS OF TIME. The Construction Contract Completion Date is the date of the last Final Inspection. It is the calendar date calculated by adding the number of calendar days specified in the Construction Contract to the date of the Initial Job Conference. If the Contractor fails to complete the Project on time, as per the Contract Documents, the Contractor is liable for liquidated damages, until such work is completed and accepted. A request for Extension of Time (EOT) via the e-Builder Change Order Process shall be made by the Contractor, if the Contractor is delayed for some reason over which the Contractor has no control. In this regard:

- A. The Contractor in accordance with the General Conditions to the Construction Contract and Administrative Procedures, must forward the Extension of Time Change Order request to the Professional with substantiating data, to include the following: actual beginning date of delay, actual ending date of delay, the number of days requested, the reason for the delay and how the Contractor was halted in its construction period.
- B. The Professional shall make its recommendation concerning the Contractor’s delay by inserting the number of days recommended and by processing the related Change Order. Should the

Professional not agree to the number of days requested, the Professional must state its reason for disagreement in the comments section of the Change Order Process and provide all substantiation to the Regional Construction Project Manager.

1201.8 CONTINUED DELAYS. If the Contractor is continually delayed, it must report an EOT no more than thirty (30) days from the beginning of the initial EOT request date. When the work is completed, the Contractor notifies the Department and the Professional of its request for termination of the EOT request. The Professional is required to submit its recommendation within five (5) days of receiving the Extension of Time Change Order. If the Professional agrees with the Contractor's request, the number of days the Professional is recommending should be indicated. If the Professional does not agree with the Contractor's request, the reason for disagreement must be clearly substantiated and included in the Extension of Time Change Order Process.

SECTION 1202 - DOCUMENTS

1202.1 CONSTRUCTION SETS. After the execution of the construction contracts, the successful Contractors will be able to download complete Construction Contract Documents from e-Builder for use during the Construction Stage.

1202.2 SUBMITTALS. The Professional must promptly review and approve/reject shop drawings, samples and other submissions of the Contractors. The Submittal Register is maintained in e-Builder. The Professional shall alert DGS and the Contractors when submissions lag behind the shop drawing submission schedule prepared jointly by Contractors and Professional at the job commencement, as provided in the General Conditions to the Construction Contract.

- A. The Professional shall review and return all Submittals within fourteen (14) calendar days of the date of receipt of the Submittals. Resubmissions shall be acted upon by the Professional within ten (10) calendar days of its receipt. Professional shall not send Submittals (approved or otherwise) to the BOPC. See General Conditions to the Agreement for Professional Services and the BOC's Administrative Procedures for details of this process. The Department may extend the review period if the Contractor violates the Submission Schedule.
1. Review for conformance with the design concept.
 2. Review for compliance with the Contract Documents.
 3. Review for Contractors' coordination with other work of that contract and of other Contractors. In critical areas require that all affected Contractors indicate acceptance on the shop drawing.

1202.3 SUPPLEMENTAL DRAWINGS. Interpretations of the Project Manual and the Contract Drawings must be reviewed and approved by BOC PM or APM prior to being issued to the Contractors. Drawings issued to clarify the work must be marked as "SUPPLEMENTAL", followed by the date of issue. Supplemental Drawings, whether a response to an RFI, or part of a change Order, will be uploaded to e-Builder. When Supplemental Drawings become too extensive, DGS may require the Professional to issue updated Construction Documents.

1202.4 RECORD DRAWINGS. The Professional must check the Contractors' field documents at each site visit to see that as-built conditions are being properly recorded as the work progresses. The Professional must also maintain a set of drawings in PDF format that indicates all addenda, RFIs, change orders, etc. This set of record drawings shall be electronically shared with DGS and updated routinely as required by the Agreement for Professional Services. This drawing set will be used for the Department of Labor and Industry Plan Revision Submission. See Section 1206, Project Close Out, for more information on Record Drawings and the L&I Plan Revision Submission.

SECTION 1203 - QUALITY CONTROL AND QUALITY ASSURANCE SERVICES

1203.1 GENERAL. The Professional must appraise and direct all specified tests and inspections of materials and equipment that are required, that the Professional recommends, and all tests required by laws, ordinances or regulatory authorities. The Professional must exercise authority to reject and stop non-conforming work by making recommendations to the BOC Director to stop the work and conduct re-testing or remediation in accordance with the General Conditions to the Construction Contract.

1203.2 QUALITY CONTROL AND QUALITY ASSURANCE TESTING/INSPECTION. Testing and inspections pertaining to each Contractor's contract may be performed by one or more testing laboratories or independent agents, retained either by the Prime Contractor or by a contract through the Professional or both. The Professional must edit the specification Section 014000 and Section 014010, and the RFP for Quality Assurance Services, to indicate lists of all required tests and coordinate testing to assure orderly progression of the work.

- A. **QUALITY CONTROL TESTING BY PRIME CONTRACTOR:** The Contractor is responsible for primary testing of all work. The Professional is to review the qualifications of the Contractors' proposed testing agents, and then review and accept test reports.
- B. **QUALITY ASSURANCE TESTING AND INSPECTIONS BY PROFESSIONAL:** Follow directions in Chapters 13 for contract administration of Quality Assurance Testing and Inspection services contracted to the Professional through Work Orders to the Professional Agreement. Construction Stage Geotechnical QA Services is a separate Work Order to the Geotechnical Engineer who, in effect, is acting as the Quality Assurance Agent for earthwork. Hazmat Air-Monitoring QA, when required, is a separate Work Order to the Professional.

1203.3 COSTS FOR RE-INSPECTIONS AND RE-TESTING. If routine inspection or testing reveals a failure to comply with the requirements of the Contract Documents or any laws, ordinances, rules, regulation or orders of any public authority having jurisdiction, the Contractor shall bear all costs thereof for re-inspection and re-testing, including the Professional's Additional Services made necessary by such failure unless Quality Assurance tests are found to be in error.

1203.4 BUREAU OF CONSTRUCTION ADMINISTRATIVE PROCEDURES. The Professional is to be guided by BOC's Administrative Procedures for testing procedures. Similar procedures must be used for all tests. Refer to the General Conditions to the Construction Contract, for additional requirements and procedures. All procedures are to be approved by the Department.

1203.5 PAYMENT. The Professional must follow the BOC's Administrative Procedures for payments for testing agents under contract to the Professional. Payments for testing agents subcontracted to the Contractor(s) are included in regular payments for work completed.

SECTION 1204 - CHANGE ORDERS

1204.1 AUTHORIZATION. Immediately refer Client Agency or Institution requests for Change Orders to the Department for direction. The Professional shall prepare Change Orders only when authorized by DGS.

Note: All processes, all documentation, all correspondence and all actions shall be initiated, processed and/or completed in e-Builder. The DGS Modernization process and the use of e-Builder process management software may require revisions to the instructions to the Professional regarding the Change Order process as experienced is gained with e-Builder.

1204.2 PROCESS. The Change Order sequence must be followed in detail as provided by the BOC's Administrative Procedures, which can be found on the DGS website and in e-Builder. The sequence is tied to the tracking system used by the DGS Fiscal Office to assure funding availability for approved Change Orders. The Professional must check the BOC's Administrative Procedures for guidelines in issuing all Change Orders.

- A. The BOC PM or APM may stop a Change Order at any time in the process. See the General Conditions to the Construction Contract (Changes in the Work) and the Administrative Procedures for additional direction.

1204.3 EVALUATION. The Professional must evaluate all Change Orders as defined in the e-Builder Change Order Process. The initial request must be evaluated to determine that it is a valid change and is not work already in the Contract. Further, the reasonableness of the Contractor's cost and time proposal must be evaluated. Unreasonable proposals should be negotiated with Contractors if agreement can be reached without delay. If agreement cannot be reached quickly, the forms and proposal are to be forwarded to the next step in the Process with explanation of disagreement. The BOC will authorize Force Account Change Orders, but only

under very specific conditions and only when normal Change Order methods for accomplishing the work have been determined to be inappropriate.

1204.4 COMPENSATION. The Professional will invoice for fees on approved Change Orders at the Basic Services fee percentage set for the Project in the Agreement for Professional Services.

1204.5 ADDITIONAL SERVICES. Additional compensation may be paid when the Services required for a change are more extensive than will be covered by the set fee. In such a case, the Professional must request additional compensation by letter to the Design Manager. The Professional should not proceed without a determination, except in emergency situations. The Professional shall not stop work or delay the construction process while awaiting a determination on whether a Work Order will be issued; nor shall the Professional delay the work while waiting for the Work Order to be executed, if one is deemed to be necessary.

1204.6 ERRORS/OMISSION. No fee is paid to the Professional, and damages may be assessed, for Change Orders determined to result from Professional error or omission. The Department's preliminary determination is marked on the approved Change Order e-Builder process. Opinions noted during the approval process are considered, but not binding. A final determination and damage assessment is made with the Professional's participation prior to Project Close-out.

1204.7 FIELD ORDERS. Minor changes not involving cost or time, and consistent with the extent of the Work, may be made without a Change Order. Discuss such changes with the Contractor and the BOC PM or APM. The BOC PM or APM will issue a Field Order when all agree. See the General Conditions to the Construction Contract, (Minor Change in the Work).

SECTION 1205 - CONTRACTOR DISPUTE PROCESS

1205.1 GENERAL. Contractors' disputes with the Department are addressed through a 3-step progression of increasingly more formal proceedings. The progression is described in the General Conditions to the Construction Contract. The Professional participates with Consultants throughout the proceedings as a Basic Service without additional compensation except as provided in the Professional Agreement's General Conditions. The Professional shall exercise impartiality in interpretations and judgments of performance throughout.

1205.2 FIELD DISPUTE REVIEW MEETING. This is the first step in identifying and attempting to reach a timely and equitable resolution of the variety of issues that arise on any construction project. The nature and structure of each Field Dispute Review (FDR) Meeting shall be flexible and consist of an informal, good-faith discussion of the current status of the Project, and identification of potential and actual disputes. The Prime Contractors, the Professional, and the BOC PM and APM shall attend. The Department's Designated Representative will chair the Meeting. If any party is dissatisfied with the decision reached at the FDR Meeting, they may appeal the decision to the second step in the dispute process. Only claims raised during an FDR Meeting may be appealed to the Claim Conference stage.

1205.3 CLAIM CONFERENCE. The second step in the dispute resolution process is a Claim Conference, which is a more formal step in the process and is described in the Commonwealth Procurement Code. Disputes not resolved in Field Dispute Review Meeting may be appealed by submitting a written claim to the Deputy Secretary for Public Works. At a minimum the Contractor, the Professional, and a representative from the Bureau of Construction shall attend the Claim Conference.

1205.4 BOARD OF CLAIMS. The third step in the dispute resolution process is filing a Statement of Claim with the Board of Claims, which is a more formal step in the process and is described in the Commonwealth Procurement Code. The Professional shall assist DGS in preparing for the hearing and testify both as to facts and as to expert opinion relating to the execution and progress of the work and on all other related matters. The provisions in the Agreement for Professional Services determine when additional compensation will be paid for these services.

SECTION 1206 - PROJECT CLOSE-OUT

1206.1 DEPARTMENT OF LABOR AND INDUSTRY "PLAN REVISION" SUBMISSION. The Professional is responsible for submitting to the Department of Labor and Industry a revised set of Construction Documents

for approval of design and construction changes made after the UCC Building Permit is issued. This “Plan Revision Submission” is also referred to as the “Department of Labor & Industry Record Drawings” and shall be submitted in accordance with PA L&I and PA UCC requirements. The Professional shall upload the approved L&I Plan Revision Submission in PDF format to e-Builder. Receipt of the approved Plan Revision Submission is required before an L&I Occupancy Permit will be issued.

1206.2 DGS RECORD DRAWINGS. Within ninety (90) days from the last Final Inspection of the Project, the Professional shall submit Record Drawings showing all changes from the Construction Documents made during the course of construction. The Record Drawings shall indicate the vertical and horizontal alignment of concealed pipes, conduits and similar items. Recorded changes shall be obtained from clearly marked field prints provided by the Construction Contractors and from Change Orders and incorporated into the AutoCAD Construction Document drawing files. Record Drawings shall become the property of the Department.

- A. All drawing sheets, whether affected by changes or not, shall be identified as “RECORD DRAWINGS”.
- B. On each sheet or sheets not affected by changes, write the words “NO CHANGES” and the date, in the Revision column.
- C. On each sheet or sheets affected by changes made during construction, show in the Revision column the date and a reference mark identifying the revision. At the point of change on the drawing, show a “cloud” around the changed area, with a descriptive note.
- D. When the Record Drawings have been completed, the Professional shall upload to e-Builder, all of the following:
 1. A complete set of final Record Drawing files in Auto CAD format. All Files shall be unlocked (no protection scheme or encryption) and bound AutoCAD drawing files, showing all changes made during Construction, and identified as described above.
 - a. Note: For AutoCAD drawings, bind all xref-dependent objects, including non-standard fonts, shape files, and line types, to the final drawings included in the final Record Drawings. A standard AutoCAD workstation shall be capable of opening and printing the drawings, as provided to the Department by the Professional.
 2. A complete set of final Record Drawing files, in PDF format, created to the full size of the original prints, showing all changes made during Construction, and identified as described above.
 3. A copy of all land survey (boundary/topographic) drawings, all test boring location and results drawings, all geotechnical, hazardous materials and other investigations and reports in PDF format (if not previously provided to DGS in electronic format).

1206.3 OPERATION/MAINTENANCE MANUAL. (Note: Certain permit applications like DEP Dam Safety permits require operation and maintenance manuals to be submitted with the permit application. The Professional shall provide these manuals at the time of making application for the permit.) After Final Inspection the following shall be collected from each Contractor: all shop drawings, catalog data, manufacturer’s operating and maintenance instructions, warranties, guaranties, certificates, test reports and other material pertinent to operating and maintaining the facility. They must be correlated and indexed, into an organized Operation/Maintenance Manual by the Contractor. The Contractor shall submit a rough draft of the manual through the Submittal Process in e-Builder for approval by the Professional. The Professional must review the Operation/ Maintenance Manual for completeness and accuracy. If unacceptable, it is to be returned to the Contractor with specific criticisms. After approval and before final payment, Contractor shall furnish the corrected and indexed Operation and Maintenance Instruction Manual in PDF electronic format to the Professional to be turned over to the Department for issuance to the Client Agency. The complete Operation and Maintenance Instruction Manual shall also be uploaded to e-Builder. See the General Conditions to the Construction Contract, and the General Conditions to the Agreement for Professional Services.

- A. Special warranties, such as roofing warranties, must be reviewed and approved by the Professional, before being submitted to the Department.

1206.4 CERTIFICATE OF OCCUPANCY. Inspections required by the code enforcement agencies to obtain Certificate of Occupancy, or Partial Occupancy, must be arranged by the Professional. All permits needed to permit occupancy must be obtained. Refer to requirements in the General Conditions to the Agreement for Professional Services.

1206.5 FOLLOW UP INSPECTION. After Final Inspection, the Professional is to perform follow up inspections. The Professional will attend the inspections and/or meetings, with Consultants as needed. The BOC will coordinate the Inspection with all involved.

SECTION 1207 - MISCELLANEOUS

1207.1 ESTIMATED MONTHLY EXPENDITURES. On selected projects, the Department may be required to furnish the Budget Office with an estimated drawdown schedule of monthly payments to the Contractors. When this is required, the Professional will be requested to furnish a schedule of estimated monthly construction payments to the anticipated completion date. The projected drawdown schedule is to be based on the Contractors' Construction Cost Breakdown and approved Progress Schedule or Critical Path Schedule.

CHAPTER 13

MISCELLANEOUS INSTRUCTIONS

SECTION 1300 - INTRODUCTION

1300.1 INTRODUCTION. Chapter 13 contains instructions to the Professional on specific topics for which the Department has standards that it wants the Professional to observe, if applicable. Applicability is determined by the nature of the Project and what is included in Basic Services by the Professional Agreement.

SECTION 1301 - QUALITY CONTROL AND QUALITY ASSURANCE SERVICES

1301.1 GENERAL. The Professional is to adopt the DGS system for specifying Quality Control (by Contractor's Quality Control Agency) and Quality Assurance (by the Professional's Quality Assurance Agency) testing and inspection. The Professional is to adopt DGS terminology and approach, with the end result of ensuring that all materials deemed to require testing are tested or inspected to ensure a quality project and to comply with requirements of the UCC, including Special Inspections and Test in Chapter 17 of the IBC.

- A. The Department requires that Professionals follow the Department's strict guidelines regarding testing and inspection in the interest of uniformity of administration by the BOC. The Professional is to include Section 014000 - Quality Control Testing Services and Section 014010 - Quality Assurance Testing and Inspection Services, adopt the Department's program and Project Manual format and terminology, and assign testing and inspection responsibilities to the recommended parties. QC and QA are not restricted to structural materials; however, non-structural materials and systems which are to be independently tested or inspected are to have the requirements specified within the appropriate technical specifications sections. The Department does not require shop testing during fabrication of structural components, when an appropriate trade association provides independent QC oversight, such as is provided for structural steel fabricators under the AISC Quality Certification Program. The Department does not ordinarily require testing of materials for which manufacturers can provide Certificates of Compliance from independent testing laboratories. These policies are not in conflict with IBC requirements.

1301.2 SCOPE. Quality Control Testing (performed/inspected by the Contractor's QC Agent) is the responsibility of the Contractor for verifying and enforcing compliance with all requirements of the Contract Documents. Quality Assurance Testing is intended to not only satisfy all Special Inspection requirements of the UCC, but also oversee the Quality Control Testing performed by the Contractor. Quality Control tests/inspections shall be required by specific type and frequency or quantity of tests as listed in Section 014000, or within the technical specification sections of the Project Manual. The exception to this is soils testing. Soils testing is to be Quality Control with no specified quantities or frequencies. The Contractor is to do whatever testing is required, without limitation, to comply with specification standards.

- A. Construction monitoring of earthwork and soils testing, which consists of reviewing Contractor QC tests, witnessing and or reviewing Contractor soil bearing tests, approval of soil bearing, and general oversight, is typically performed by the Professional's Geotechnical Engineer, who acts as the QA Agent for soils monitoring work. The earthwork monitoring may however, also be performed by the Professional's Quality Assurance Agent if approved by DGS on a project by project basis. Refer to Exhibit G1 (CS), Construction Stage Geotechnical Quality Assurance Services and Sample RFP, included in e-Builder for instructions and sample RFP for Geotechnical Services.
- B. When structural Quality Control Testing is required, the technical specifications shall refer to Section 014000 for all testing requirements, where types and frequencies of tests shall be listed in detail. Testing requirements shall not be stated on the Drawings, or in the technical specification sections. Detailed descriptions of testing may be included in the specifications where necessary.
- C. When structural Quality Assurance Testing or Inspections are required, the technical specifications shall refer to Section 014010 for all testing and inspection requirements, where types of tests and inspections only are listed. Quality Assurance Testing and Inspection requirements shall not be stated in the technical specification sections.

- D. In addition to the UCC-6 Form, Paragraph 1705 in Chapter 17 of the IBC requires the Professional to submit a Statement of Special Inspections, where all Testing and Inspections proposed are stated in detail. This Plan should have the approval of the QA Agent for structure and soils. UCC-6 is entitled "Special Inspections and Observations Statement", but does not require detailed information.

1301.3 WORK ORDER FOR QUALITY ASSURANCE TESTING AND INSPECTION SERVICES.

- A. If Quality Assurance Testing or Inspections are required, the Professional is responsible to provide this service as an Additional Service under a Work Order. The RFP for Quality Assurance Services and instructions for the entire process are outlined in Exhibit G2 included in e-Builder. These procedures and RFP format shall be strictly observed in order that the responsibilities in the Work Order are clear and are in accordance with DGS requirements. Based upon Project conditions, Contractor performance, and QC test results, the Professional and the Department are to authorize Quality Assurance tests and inspection hours during construction as deemed necessary to assure the Professional and the Department of Contract compliance and as required to comply with the Pennsylvania Uniform Construction Code (UCC) and the International Building Code (IBC). Tests shall be standard tests that are identified by ASTM or other designation. The budget, as well as the recommended firm for the Quality Assurance Services for the Project, will be established by the Work Order, which will be based on the accepted Proposal.
- B. The Construction Documents Submission shall include a draft of the RFP documents for Quality Assurance Testing and Inspection Services. It shall be coordinated with the requirements for testing and inspections in the Project Manual.
- C. The Professional shall solicit proposals for the Quality Assurance services sometime during the Project bidding period. Obtain at least three (3) proposals. Submit the proposals to the BOPC with a cover letter indicating a recommendation using the Amendment and Work Order process in e-Builder. The Professional shall allow sufficient approval time by the Department in order to have the Quality Assurance Agent ready for mobilization at the Initial Job Conference.
- D. After approval, the Department will issue a Work Order for Additional Services.
- E. The Professional is responsible for directing the Quality Assurance program. It shall solicit advice from its Consultants as it deems appropriate. The Professional shall direct the testing and inspection program based on the need to confirm tests by the Quality Control Agent, and to perform additional inspections required to determine condition of the work independently, and other work necessary to assure full compliance with UCC/IBC requirements, specifically Special Inspections.
- F. The BOC PM or APM shall be consulted prior to implementing any action by the Quality Assurance Agent. The purpose of this consultation shall be to bring areas of concern to the Department's attention and assure that all involved parties are aware of the rationale being used. The BOC staff shall also bring to the attention of the Professional any items that may be of concern that would require further review and supplemental testing. Implementation of the Quality Assurance Agent shall be a collective effort that must be closely coordinated between the Professional and the BOC staff.
- G. The Department's BOC staff is to coordinate the performing of tests and inspections, to ensure that they are authorized by the Professional, are completed as specified, and test data/results are submitted to the necessary parties. When unsatisfactory test results occur, the BOC staff is to confer with the Professional and ensure that appropriate action is initiated.

SECTION 1302 - UTILITY REQUIREMENTS

1302.1 GENERAL. All new DGS building projects, as well as many additions, rehabilitations, and alterations projects, may require new utility services or upgrades to existing utility services. This Section describes the basic requirements regarding the need for and the obtaining of easements and agreements for the required services. The Professional is responsible for requesting all easements, utility agreements, and license agreements necessary for the work of the Project. All information must go through the Design Manager for

tracking purposes. All necessary Easements, Utility Agreements, and License Agreements must be obtained before the Project can be cleared for bidding.

1302.2 ORIENTATION. At the Orientation Conference, Professionals are advised of their responsibility to arrange the installation of all required utilities for the Project, as well as the critical importance of arranging for the utilities in a timely manner, so as not to cause unnecessary delays to the project. Refer to Chapters 3, 4, 5, 6, and 7 for detailed instructions regarding utility requirements at each Design Stage.

1302.3 UTILITY AGREEMENTS AND UTILITY LICENSES. The Professional shall contact all utility companies serving the site and affected by the work to discuss the details of the Project to determine the extent of the work that the utility company itself may be required to perform. A determination should be made whether or not any charges for providing gas, water, electric, telephone service or other utility service to the facility, or charges for relocating existing services, will be levied by the utility company. Depending upon the magnitude of the charges, a determination will be made by the Department whether to include the charges in the Electrical or General Contract or whether to negotiate a direct payment by DGS or the Client Agency to the utility company.

- A. A License Agreement is necessary when there is zero cost to the Project, but the Utility Company needs a right-of-way on Commonwealth property, which allows the Utility Company to access the property to construct, install, repair, maintain, and/or replace their line.
- B. A Utility Agreement is necessary when there is a cost to the Project, and Project funds are to be used to pay the Utility Company for work they perform for the Project or, depending on the circumstances, when project funds are to pay some type of fee to the Utility Company. The Utility Agreement includes a right-of-way on Commonwealth property, which allows the Utility Company to access the property to construct, install, repair, maintain, and/or replace their line.
- C. If it is determined that a Utility License or Utility Agreement is required for the project, contact the Design Manager to discuss the procedure.

1302.4 SPECIAL AGREEMENTS. The Professional shall provide the Design Manager with information for review with DGS Legal when special utility agreements need to be negotiated and drawn up with local authority or utility companies to bring offsite or other utilities to the project site. Associated costs may or may not come from the Base Construction Amount, as determined by the Department. During Design Development, the Professional should have a clear understanding of utility service requirements for the Project.

1302.5 LEGAL REQUIREMENTS. When a License Agreement or a Utility Agreement will be necessary for a project, the DGS Legal Office will require certain information, in order to be able to write the Agreement. The Professional must obtain the required information from the Utility Company and provide it to the Design Manager, who will in turn contact DGS Legal Office to discuss the development of an Agreement. The Professional must obtain and provide the following information:

- A. A Service Routing Plan, showing the location of the Utility, the extent of the Utility Company's Work, the extent of the Contractor's work, and the demarcation point.
- B. A narrative description of the Utility Company's scope of work.
- C. A narrative description of the Contractor's scope of work.
- D. The Utility Company's Cost Proposal on the Utility Company's letterhead. (Note: The requirement for a Cost Proposal is not applicable for a License Agreement.)
- E. The Utility Company's point-of-contact information (name, address, telephone and email address).

1302.6 SEWER AND WATER. The requirements for Sewer and Water may be different. The Professional may have to work with Local Authorities, as opposed to Utility Companies. Tap fees may be involved, which would need to be described in the Construction Documents. In this case, the following additional information may need to be obtained:

- A. Tap/Connection Fees, if any.
- B. A copy of the Ordinance establishing the fees (tap fees must be in a fee schedule).
- C. Local Authority's solicitor contact information.

1302.7 CONSTRUCTION. Service applications are applied for by the Contractors on behalf of the Department, designating the initial payer of use charges according to requirements of the Construction Contract. The Department will authorize changing the name of the payer at the appropriate time, also in accordance with the terms of the Construction Contract.

SECTION 1303 - VALUE ENGINEERING

1303.1 SCOPE. Basic Services include value engineering as required to design the Project within the Base Construction Amount. On certain projects, as determined by DGS, more extensive Value Engineering may be required as an additional service.

- A. Value Engineering is a systematic application of recognized techniques to obtain maximum value of every dollar spent. Value Engineering utilizes an organized, creative analysis of the functions of systems, products, equipment, materials and/or services in order to provide these functions at a most efficient cost without sacrificing quality, aesthetics, or operation and maintenance capability.
- B. Value Engineering on DGS projects will be applied by recognized/certified firms/individuals using accepted techniques to identify the function of a component, system or service in order to establish lowest overall cost, while meeting project objectives and specifications.
- C. Value Engineering can be performed by a separate entity retained by the Professional, the Department or its Client Agency. Direct involvement, participation or cooperation/ coordination in the process will be an Additional Service, in accordance with the Professional Agreement's General Conditions (Value Engineering).

SECTION 1304 - CONSTRUCTION MANAGER

1304.1 LIMITED-SERVICE CONSTRUCTION MANAGEMENT. The Department may determine at any point in the design, bidding or construction stage, that an independent Construction Management firm will be used to provide limited/selected services, including but not limited to, cost estimating, scheduling, constructability reviewing, value engineering, and/or construction administration. The Professional shall generally cooperate with the Construction Manager (CM) throughout the course of the Project. The CM shall have access to the drawings, specifications and other information pertinent to the selected CM services within the Project's e-Builder documents folder structure. Note: The fact that the Department has provided a CM to assist during the Design Stages does not relieve the Professional of his contracted responsibilities for Scheduling or Cost Estimating.

- A. If after the CM's review of the Professional's estimate of probable cost, the CM's opinion differs significantly from the opinion of the Professional, the CM shall meet with the Professional and attempt to reconcile the differences. If the differences cannot be reconciled, an additional Base Bid may be provided to reflect the CM's opinion.
- B. Where the Project Scope has been significantly reduced based on the Professional's estimate of probable cost, the Department reserves the right to have the CM provide an independent detailed cost estimate of the Project. If the CM determines that the Project scope does not need to be reduced to the extent proposed by the Professional, an additional Base Bid may be provided to address the Project scope reduction issue.
- C. Incorporating the CM's suggestions into the project documentation, where applicable, is considered part of the Professional's Basic Services.

1304.2 FULL-TIME CONSTRUCTION MANAGEMENT. The Department may also determine that an independent Construction Management firm will be used to provide full-time in-depth CM services. In this case,

the scope of the Construction Manager's tasks and services will be established prior to the Orientation conference, including but not limited to, programming, project oversight, team management, cost estimating, cost monitoring, scheduling, constructability reviewing, value engineering, division of work, construction administration, and/or inspection. The Professional shall generally cooperate with the Construction Manager (CM) throughout the course of the Project. The CM shall have access to the drawings, specifications and other information pertinent to the selected CM services within the Project's e-Builder documents folder structure. The Professional's fee negotiated before commencement of the Project will include all costs for cooperating and exchanging documents and information to the Construction Manager through e-Builder.

- A. Where required by the Master Schedule, the construction work may commence prior to completion of the Professional's overall Design Development and or Construction Documents. The Professional shall provide design and contract administration services in an overlapping manner, rather than in the traditional chronological sequence, in order to expedite construction. The CM shall, with the assistance of the Professional, designate and coordinate the portions of the work to be performed as segregated overlapping subdivisions of the overall Project.
- B. The Professional shall coordinate the drawings and specifications of all separate prime contracts to ensure against omissions, conflicts, overlaps or duplications, regardless of the actual number of bid packages/prime contracts scheduled by the CM and entered into by the Department.

SECTION 1305 – SUBSURFACE INVESTIGATIONS AND REPORTS

1305.1 SCOPE. The Professional shall obtain assistance from its Civil/Structural Engineer as set forth in these instructions and in Exhibit G1 included in e-Builder, and be responsible for obtaining subsurface and related data that will yield sufficient information for an accurate evaluation of the existing subsurface and related conditions for the following purposes:

- A. Analysis, design and construction of foundation and substructure.
- B. Analysis, design and construction of site work, including embankments, slopes, retaining structures, underground structures, site and subsurface drainage, roads and pavements.
- C. Soil erosion and sedimentation control.
- D. Infiltration for stormwater management design.
- E. Cost analysis and estimating of 'Unclassified' excavation by Professional and Contractor/Bidders.
- F. Analysis of excavation and fill conditions.

1305.2 INITIAL SUBSURFACE AND RELATED SITE INVESTIGATION REPORT.

- A. Prior to Schematic Design Submission the Professional's Civil/Structural Consultant shall, with the Professional's help, contact the BOPC's Design Manager for relevant data obtained from previous projects. In addition to this, other sources of information shall be explored. The Civil/Structural Engineer shall then visit the site of the proposed project and inspect by visual or physical means the topographical and geological conditions that are prevalent. Particular attention shall be directed to the following items:
 1. Evidence of fill material.
 2. Outcrops of rock strata.
 3. Type of overburden.
 4. Features of the terrain.
 5. Substructures.
 6. Evidence of distress of adjacent buildings.
 7. Water levels (ground and other).
 8. Information pertaining to, or observation of, any evidence of buried fuel or other underground storage tanks.

9. Previous boring results and foundation reports on projects in the vicinity of the proposed facility.
- B. At the Schematic Design Submission, the Professional's Structural Engineer shall submit the Initial Subsurface and Related Site Investigation Report. The Report shall state observed conditions, indicate possible foundation systems and recommend whether Test Borings and/or other site investigations are required. If test borings are required, the Professional and his structural engineer shall prepare Contract Documents for Geotechnical Services. A copy of the RFP documents shall be included in the Schematic Design Submission for review and approval.

1305.3 PRE-CONSTRUCTION GEOTECHNICAL SERVICES. Geotechnical Services for the Design Stages shall include test borings, test pits and other Pre-Construction Geotechnical Investigations, along with the Geotechnical Report, to be quoted by the Geotechnical Consultant.

- A. Specifications for Test Borings and the Geotechnical Report shall be based upon best practices, and shall include a test-boring plan based upon the proposed footprint of the work and the expected foundation type to be used.
- B. The Geotechnical Report shall include specific recommendations for designing structures, slabs on grade and paving.
- C. The Geotechnical Consultant shall be required to submit with the Construction Documents submission a sealed statement to the effect that the design drawings and specifications are in accordance with his recommendations. See Exhibit G1 included in e-Builder for detailed Instructions for Pre-Construction Geotechnical Services and Sample RFP.
- D. The Professional shall solicit not-to-exceed Proposals from as many Geotechnical Consultants as may be deemed reasonable, not less than three (3). The Geotechnical Consultants shall be qualified and have a minimum of five (5) years of experience doing similar consulting. Principles shall be Registered Professional Engineers in the Commonwealth of Pennsylvania. Solicitation of Pre-Construction Geotechnical Services shall not take place until the footprint of the work, and the RFP, have been approved.
- E. Upon receipt of Proposals, the Professional shall prepare an analysis consisting of a comparative statement, proposal evaluation and recommendations for contract award. All proposals received shall be submitted to the Design Manager, along with the cover letter, for written approval to award the Work Order.
 1. The Professional shall try to obtain proposals from firms local to the Project location, so that costs will be minimized for the Construction Stage Geotechnical Services.
- F. The Geotechnical Report shall not contain a broad disclaimer that excuses the consultant of responsibility.

1305.4 TIME OF COMPLETION OF INVESTIGATION. The Pre-Construction Geotechnical Investigation and Geotechnical Report must be completed prior to, and the results shall be part of, the Design Development Submission. Contact the Design Manager if it is not possible to have the results and report in time to be incorporated into the design/documentation in time for the submission.

1305.5 SUBMISSION OF DOCUMENTS TO THE DEPARTMENT. The Final Geotechnical Report shall be prepared, signed and sealed by a Professional Engineer registered in Pennsylvania.

- A. Reference should be made to Chapters 4 through 7, regarding documents to be submitted for various Design Stage reviews.

- B. Upon completion of the test boring contract, the Geotechnical Consultant shall submit a complete report to the Professional covering the field work and laboratory testing, with complete analysis of each boring and with recommendations for foundation types, based on soil and rock bearing capacities. The Professional shall provide a copy to its Civil/ Structural Consultant and upload a copy in electronic format into the Project files in e-Builder.

1305.6 CONSTRUCTION DOCUMENTS SUBMISSION. The Professional shall submit with the Construction Documents Submission, a letter stating that this Project was designed in accordance with the recommendations of the Geotechnical Consultant. If exceptions are taken, they must be justified.

1305.7 RELEASING THE GEOTECHNICAL REPORT. The Test Borings location drawings, test boring logs, and the lab test results contained within the Geotechnical Report are for the purpose of providing factual data and information for the Professional, as well as the prospective bidders and are incorporated into the construction contract as a Contract Document. The remainder of the Geotechnical Report is subjective, analyzing the data, drawing conclusions and making recommendations for the guidance of the design team. The complete Report, other than the Test Borings information, is for informational/guidance purposes only; it is not to be incorporated into the construction contract as a Contract Document and any conclusions drawn from them are not warranted as accurate by the Department or the Professional. Bidding Contractors are permitted to review the complete Geotechnical Report and submit a bid, provided they indicate they agree to a disclaimer included in the Bidding Module in e-Builder.

1305.8 CONSTRUCTION STAGE GEOTECHNICAL SERVICES. In order to assess the Contractor's Quality Control Testing program, earthwork monitoring during construction shall be provided by the Geotechnical Consultant. The Professional shall obtain a not-to-exceed proposal for Construction Stage Geotechnical Services, from the Geotechnical Consultant. See Exhibit G1 included in e-Builder for detailed Instructions for Construction Stage Geotechnical Services and Sample RFP. On-site presence and laboratory tests during the construction period shall be provided at rates stated in its Proposal for Construction Stage Geotechnical Services, to be requested of the Department after the project Bid Date is determined.

- A. If the Department decides that the proposal from the Geotechnical Engineer is not competitive, the Design Manager may require the Professional to obtain two (2) or more additional proposals.

SECTION 1306 – SPECIAL SITE INVESTIGATIONS

1306.1 WETLANDS IDENTIFICATION AND DELINEATION. The Professional's responsibility in site selection and site expansion includes the determination of the absence/presence of wetlands. The Professional is to contact the DEP Regional Office's Bureau of Waterways Engineering and Wetlands and coordinate a site visit where DEP personnel will make an absence/presence determination. If it becomes problematic to obtain DEP regional personnel to make the determination the Professional may then use in-house staff or a consultant that is a qualified wetlands delineation specialist, familiar with state and federal criteria and regulations. This initial investigation is part of "Basic Services." If wetlands are present and need to be delineated, the Professional shall prepare a program outline and submit it to the BOPC for approval. After approval, proposals shall be solicited from at least three (3) suitable consultants. The proposals shall be submitted to the Design Manager for written approval, and to write the Work Order for the Additional Services. The Design Manager will accept a letter from the Professional stating that wetlands are not found on the site. The Professional may determine this based on general observations without hiring a consultant and is encouraged to do so where conditions are apparent. The Professional shall submit the completed study to the Department, in electronic format through e-Builder.

1306.2 ARCHAEOLOGICAL STUDIES. The Professional shall, in accordance with Act 1988-72, perform an initial investigation, and contact the Pennsylvania Historical and Museum Commission (PHMC) before commencing any field investigation or project design. If PHMC requires any archaeological investigation, the Professional shall obtain necessary information from PHMC and prepare suitable documents for soliciting proposals and a list of at least three (3) suitable consultants. The proposals shall be submitted to the Design Manager for written approval, and to write the Work Order for the Additional Services. The Professional shall upload the completed study, in electronic format to the Project Files in e-Builder.

1306.3 ENDANGERED SPECIES. As part of “Basic Services” for all projects, the Professional shall perform an initial investigation, and screen the site with the Pennsylvania Natural Diversity Inventory (PNDI) maintained by the Pennsylvania Natural Heritage Program in the Department of Conservation and Natural Resources and provide to the Department, a copy of the findings of the initial investigation. If the screening results in any potential conflicts or impacts on plant or animal species of concern, the Professional shall prepare a program outline for a biologist to investigate the site and identify what, if any, impacts are anticipated and provide recommendations for mitigation. This shall be submitted to the BOPC for approval. After approval, proposals shall be solicited. The proposals shall be submitted to the Design Manager for written approval, and to write the Work Order for the Additional Services. The Professional shall upload the completed study in electronic format to the Project Files in e-Builder.

1306.4 ENVIRONMENTAL IMPACT STUDIES. For all projects, the Professional shall make a preliminary Environmental Assessment (EA) as part of Basic Services, to include any environmental and historic/archeological considerations for the Project. This would include the initial investigations mentioned in 1306.1, 1306.2 and 1306.3 above. When required, especially those projects that involve Federal funding, the Professional shall formalize those findings in a written report as an Environmental Assessment (EA) meeting the requirements of the National Environmental Policy Act (NEPA) in the form required by the Federal Agency providing funding. If more extensive investigation is required, then the Professional shall prepare an Environmental Impact Statement (EIS) in accordance with the requirements of NEPA and the Federal Agency providing funding. The work required to prepare the formal EA or EIS will be considered as an Additional Service. The Professional shall prepare suitable documents for soliciting Proposals and a list of at least three (3) suitable consultants. The Proposals shall be submitted to the Design Manager for written approval, and to write the Work Order for the Additional Services. The Professional shall upload the completed study in electronic format to the Project Files in e-Builder. Note: An EA may only be required to support a federally-funded project and is different from a hazmat survey of existing conditions.

SECTION 1307 - HAZARDOUS MATERIALS

1307.1 PROFESSIONAL’S RESPONSIBILITIES TO THE DEPARTMENT. (For additional information, refer to Exhibit H1, Protocol Regarding Asbestos, Lead, PCB’s/Mercury, Radon and other Hazardous Materials, included in e-Builder). Most major building renovations or additions will encounter some kind of hazardous material (Asbestos, Lead, PCB, Radon, Misc. Hazmat Items, etc.) during the Project. See Chapter 2 for requirements regarding contaminated soil. The Professional is responsible for addressing hazardous materials to the extent they may impact the Project. Professional services necessary for the remediation of such hazardous materials will be covered under Basic Services, except as noted below, or in the Project Scope and Professional Agreement. Prior to beginning the Project design, the Professional, through consultation with the Department and the Client Agency, shall determine whether hazardous materials are present on site, requiring a hazardous material study and evaluation. A hazardous material Study and Evaluation and Quality Assurance Consultant services are considered Additional Services as described herein, and the Design Manager will process a Work Order. Additional Services protocol is described below:

- A. The Professional must establish the qualifications for, and solicit proposals from qualified consultants in their fields, assuming its staff will not be providing these services (Sample proposal letters are provided in Exhibit H1, Protocol Regarding Asbestos, Lead, PCB’s/Mercury, Radon and other Hazardous Materials, included in e-Builder). The Professional must submit a draft of the RFP for Department approval. The work is to be completed prior to the Schematic Design submission, so that it can be part of the approved project scope.
- B. After the Professional has received the proposals back from three solicited firms, it is responsible to recommend the firm, which can best provide the services at the lowest cost to the Department. The Professional shall document and justify to the Department the reason for its selection, if the lowest price is not chosen. The documents submitted to the Department must include the original solicitation and all proposals received. A Work Order will then be processed by the Department.
- C. Based on the results of the Study and Evaluation Report, the Professional will engage a Certified PA L&I Asbestos Designer to develop the design documents for hazardous materials work. The Professional will prepare all specifications, drawings and obtain approvals as outlined by the Department. The design shall meet EPA, OSHA, DEP, L&I regulations and Local codes. Guidance specifications are available upon request from the Design Manager, and indicate the level of detail

expected for the project work. All Hazmat remediation work is included within the construction allocation and thereby included in the Basic Services fee.

1307.2 EXAMPLES OF HAZARDOUS MATERIALS PROPOSAL LETTERS. See Exhibit H1 included in e-Builder for samples of Proposal letters for identification survey for hazardous materials. Amend the example letter accordingly to suit the project scope. (The Professional should coordinate a walk-through of areas to be surveyed so proposals reflect field conditions of the Project.)

SECTION 1308 - PROPERTY AND TOPOGRAPHIC SURVEYS

1308.1 INITIAL DATA AND SITE INSPECTION. Shortly after the Orientation Meeting the Professional shall collect all available Property/Topographic survey information for the site and surrounding area by contacting the Design Manager, Client Agency and the Institution. After collection and evaluation of initial data the Professional and its Consultants must inspect the site, including roads, storm drainage system, sewage treatment and disposal, water supply, primary and secondary structures, parking lots, walkways, lawns, grades, drainage, utilities, existing structures, physical features and other significant items.

1308.2 REQUEST FOR LAND (PROPERTY/TOPOGRAPHIC) SURVEY. After analyzing the data and the Project requirements the Professional shall promptly submit to Design Manager, a draft copy of the RFP for Land (Boundary and/or Topographic) Survey services, containing all the details and information therein required. See Exhibit G3, Instructions for Land (Boundary and/or Topographic) Survey and Sample RFP included in e-Builder.

- A. The Professional must provide to the proposers, along with the RFP, attached site maps showing the limits of the area(s) to be surveyed. Such maps shall become part of the proposal.
- B. GPS work will require an OPUS Report.

1308.3 AUTHORIZATION OF SURVEY WORK. The Design Manager will review the Draft RFP for Land (Boundary and/or Topographic) Survey and inform the Professional whether revisions are required or if the RFP is ready to be sent out to obtain proposals from outside Professional Land Surveyors.

- A. The Professional shall obtain proposals for performing the required survey work from a minimum of three (3) Professional Land Surveyors located in the Project vicinity. All proposals received shall then be submitted to the Design Manager, with the Professional's recommendation for awarding the work.
- B. If the Professional has in-house capability to perform the necessary survey work, it may submit its own Proposal based upon the rates stated in the Agreement.
- C. Upon review and approval, a Work Order will be issued by the Department for Additional Services.

1308.4 AERIAL SURVEYING AND MAPPING. Where this type of work is required, it shall be performed in accordance with requirements of the Pennsylvania Department of Transportation specifications for 'Aerial Photography, Field Control Surveys and Topographic Mapping', Division 02, Publication 122M, latest version.

1308.5 ACT 287, UTILITIES. The Professional shall comply with the current Act 287 (as amended), and PA One Call provisions. The Professional shall contact the institutions and utility companies for location and identification of utilities on project site prior to survey. The Surveyor shall identify and record PA One-Call paint marks on the survey.

1308.6 SURVEY DOCUMENTS/DELIVERABLES. Deliverables, including Survey drawings (signed, sealed and dated) and data files covering all survey work performed, shall be uploaded in electronic format to the Project Files in e-Builder, before the submission of an invoice for the last 10% these Additional Services by the Professional.

SECTION 1309 - SUBSURFACE UTILITY INVESTIGATION

1309.1 OVERVIEW. Where the consequences of not knowing precisely where the underground utilities are located may result in substantial Contract Change Orders or may imperil the safety of workers, the Professional's request for Subsurface Utility Investigation (SUI) will be considered.

1309.2 SCOPE. Subsurface Utility Investigation (sometimes referred to as Subsurface Utility Engineering), shall be an Additional Service provided by the Professional to precisely locate all underground utilities on the construction drawings.

- A. This service will be approved by the BOPC only after all available information and records concerning utility locations have been investigated by the Professional, in accordance with the Basic Services requirements of the Professional Agreement.
- B. Appropriate geophysical prospecting techniques, including radio frequency electro-magnetic, magnetic, acoustic emission sonics, terrain conductivity and ground penetrating radar, shall be used to provide a comprehensive horizontal map and give an indication of vertical position. Select excavation may be used to determine precise depth when the Project requires.
- C. The results of the Subsurface Utility Investigation, where possible, are to be furnished to the Professional in a graphic format that will allow layers to be shown on appropriate drawings, in order that said lines, located by the investigation, can be identified. The results of the SUI shall be incorporated into the Utility Plans in the Construction Documents. The Professional shall not be entitled to more than 90% of the Work Order fee, until deliverables are provided to the Department.

1309.3 PROCEDURE. After approval of the Schematic Design Submission the Professional shall determine if Subsurface Utility Engineering is necessary for development of the Project. Information shall be gathered and plotted on the Design Development documents.

- A. The Professional's request to the BOPC for Subsurface Utility Engineering shall be in writing and must include a detailed plan of the area to be investigated. The BOPC will review the request and reply with written authorization to solicit proposals for this service.
- B. The Professional shall establish the qualifications for and solicit proposals from at least three (3) qualified Subsurface Utility Engineering firms. Proposals must include any local permits required for excavation. Restoration of all excavation or disturbed areas shall be included. There shall be full agreement prior to awarding the Contract on the limitations of accuracy and responsibility of the Subsurface Utility Engineering firm with respect to its work.
- C. The Professional shall review the proposals and submit them to the Design Manager with its recommendations for contract award. The Department will approve the Additional Service and initiate a Work Order.

SECTION 1310 - FUEL FEASIBILITY STUDY

1310.1 INTRODUCTION. Deciding which of the several energy sources provides the optimum means for space conditioning is a problem that becomes increasingly complex. Changes in energy economics, improvements in construction methods and materials and increased labor costs for construction and operation have contributed to the need for comprehensive economic studies to determine the best energy source. The purpose of this instruction is to provide a reference for the Professional preparing energy selection studies for Department. Contact the Design Manager to discuss the requirements for each specific project.

1310.2 PROCEDURE . After review of the Schematic Design Submission, the BOPC will determine if a Fuel Feasibility Study is required for further development of the project. The BOPC will notify the Professional in writing and request a cost proposal to provide the study. Once a Work Order to the Professional Agreement is approved, the Professional will be notified to proceed with this Additional Service.

- A. Preparation of a Fuel Feasibility Study does not relieve the Professional of providing a Coal Non-Use Justification Letter (a Basic Service as described in Chapter 4), as part of the Schematic Design Submission.

1310.3 PRESENTATION. The study shall be developed in two (2) parts. The first part contains the pertinent information regarding the costs involved in constructing, owning and operating the system. The second part is a summary of calculations for the information of the BOPC engineering staff. All information appearing in the outline shall be substantiated by a detailed submission of calculations. Coal and oil prices, and gas and electric rate schedules shall be included verifying energy costs used in this study.

1310.4 ECONOMIC COMPARISONS. Determination of the type of space heating system that will be the most economical to the Commonwealth for a project requires that all costs connected with the installation be projected over the life of the installation. Merely comparing the operating costs of two (2) or three (3) equivalent systems for one (1) year will not suffice. In order that all costs be compared on an equitable basis, it is necessary to express each cost item and the frequency of payment in equitable terms. Confusion is avoided when initial or construction cost and yearly operating costs are presented on a common basis.

- A. The construction cost of the project is amortized over the life of the installation. With projects constructed by DGS this amortization cost is paid to DGS as a 'rental fee' as determined by policy. By adding up the anticipated, individual yearly costs, including 'rental', the ultimate cost of the installation to the user can be determined. Where cost factors vary from year to year it becomes necessary to tabulate the individual costs over the life of the installation when using this method of predicting ultimate cost.
- B. The average owning and operating cost of the project over its expected life can be determined as the tabulated costs divided by the number of years.

SECTION 1311 - COAL FUEL NON-USE JUSTIFICATION

1311.1 COAL FUEL NON-USE JUSTIFICATION. State Act 1990-28 requires that any heating system or heating unit installed in a Facility owned by the State on or after April 9, 1990 shall be fueled by coal produced from mines in Pennsylvania. The Act also states that any heating system or heating unit shall be exempt from this requirement, if it has been determined that:

- A. Using coal as the fuel for that heating system or heating unit would violate existing or reasonably anticipated environmental laws or regulations; or
- B. Using coal as the fuel for the heating system or heating unit would not be cost-effective when compared to using other forms of energy; or
- C. Using electricity generated primarily from the combustion of coal would be more cost effective when compared to using coal as the fuel for that heating system or heating unit; or
- D. The principle fuel for the heating system or heating unit would be natural gas from wells located in Pennsylvania or wood from forests located in Pennsylvania, if such fuels were at least as cost effective as using coal as the fuel; or
- E. That heating system or heating unit was in or beyond the Design Stage prior to the effective date of this act.

The Coal Non-Use justification will be submitted and reviewed through an e-Builder process. Refer to the training guides provided for the process in e-Builder.

Note: In determining cost-effectiveness, the Professional shall perform a 25-year (min.) Life Cycle Cost Analysis, that shall include equipment costs, fuel costs, and operations, labor costs and maintenance costs. The fuel costs used in the analysis shall be current, local, and verifiable. The yearly inflation rate used in the analysis should generally not exceed 3%, unless approved by the Department. In addition, the Professional shall provide all compelling reasons (space limitations, ash removal, environmental issues, or other) as to why PA coal should not be used.

Documents for the Coal Non-Use Justification analysis shall be submitted with the Schematic Design Submission.

SUMMARY OF REQUIRED INFORMATION						
FUEL SOURCE	EQUIP. COST	ADD'L BUILDING COST	EQUIP. OPERATION & MAINT. \$/YR *	BUILDING MAINT. \$/YR *	FUEL COST \$/YR	25 YR LIFE CYCLE COST
COAL	\$	\$	\$ /YR	\$ /YR	\$ /YR	\$
PROPOSED	\$	\$	\$ /YR	\$ /YR	\$ /YR	\$
SAVINGS	\$	\$	\$ /YR	\$ /YR	\$ /YR	\$

* Include labor costs

The determination that the proposed heating system or heating unit be exempt from the Pennsylvania coal-use requirement will be reported to the Appropriations Committee of the House of Representatives and the Senate, as required by State Act 1990-28.

SECTION 1312 - CONDUCTING AN INDOOR AIR QUALITY (IAQ) ASSESSMENT PROGRAM

1312.1 SCOPE. Indoor Air Quality (IAQ) assessment may be conducted as a Basic or Amended Additional Service by the Project Design Professional. The requirement to assess IAQ in new construction and major building renovation projects will be established by the Department early in Project planning or Design Stage and will be conducted upon completion of construction.

- A. Upon direction, the Professional shall conduct a series of indoor air quality assessments to insure the absence of chemical emissions and out-gas contaminants resulting from building materials and furnishings. All testing, recommendations and concluding reports shall be performed under the direct supervision of a Certified Industrial Hygienist.
- B. The scope and intent of services to be provided will be determined by the Department in consultation with its Client Agency in advance of the Final Inspection.

1312.2 THE BASELINE ASSESSMENT. After Final Inspection, when the carpeting, ceiling tile, painting, wall finishes and rubber based products have been installed, and after the HVAC system is balanced and fully operational, an IAQ baseline assessment shall be performed.

- A. The purpose of the baseline assessment is to establish baseline criteria prior to the installation of furnishings. It will allow the Professional to determine if the carpeting, ceiling, wall finishes, or even the outdoor make-up air contribute any potential IAQ problems. The building HVAC system shall be operating, for a minimum period of one (1) week, in a normal comfort mode to simulate occupancy conditions, as close as possible.
- B. The baseline assessment shall provide baseline data throughout the building, in the air handling units, and for the outside air. The IAQ baseline assessment shall consist of, but not limited to, performing the following tasks:
 1. Review shop drawings, catalog cuts and descriptive data of the building materials and become familiar with their composition for future reference if similar type contaminants are discovered in the air.
 2. Verifying the ventilation air flow rates at selected diffusers throughout the building, percent of outside air introduced into the system, direct building exhausts; and comparing to design criteria.
 3. Collecting air samples for formaldehyde and organic vapors, and comparing to NIOSH and OSHA threshold limit values.

4. Collecting temperature and relative humidity readings, and comparing to ASHRAE comfort zone criteria.
5. Recording any additional general observations or conditions, which may affect IAQ (such as dust, vermin, water leakage, odors, mold, etc.).
6. Preparing a written report documenting the IAQ assessment, including all specific test data results, identifying problems and potential problems and recommendations.

1312.3 BUILDING AIROUT. This procedure shall be initiated, if required:

- A. If the baseline assessment reveals air contaminants above the threshold limits, the building HVAC system shall be operated using the maximum amount of outdoor air possible to attempt to purge the building of any unwanted airborne substances while furnishings are moved into the building and while still maintaining reasonable temperatures (65°F to 80°F).
- B. The systems shall be operated as such until the data received indicates that the air sample levels in the building have dropped below the recommended threshold limits as verified by follow-up assessments described in the following paragraphs. If baseline limits are below recommended limits, the HVAC system shall remain in the normal operating mode.

1312.4 FOLLOW-UP ASSESSMENT. A follow-up assessment will be made, if required:

- A. The follow-up assessment shall be a series of assessments in each zone and with the HVAC system set in the normal comfort mode for at least twenty-four (24) hours prior to testing. The purpose of these assessments is to determine if the building air-out has improved the discovered indoor air quality problems prior to occupancy. The HVAC system should be returned to 'air-out' mode after testing, until the test results and report have been received. An assessment shall take place in every zone. In those zones which test positive for contaminants, a second follow-up assessment shall take place after corrective actions are determined and have occurred.
- B. An initial follow-up assessment shall consist of performing all of the tasks outlined in Paragraph 1312.2 B. If the air samples show formaldehyde and/or organic vapor levels above the NIOSH and OSHA exposure limits in the initial follow-up assessment, then additional follow-up assessments may be required by continuing the air-out in the unacceptable zone(s) for two (2) weeks.
- C. A partial follow-up assessment, consisting of performing tasks found in Paragraph 1312.2 B (3) and 1312.2 B (6), will be performed to determine if the additional period of 'air-out' process has dropped the levels below the recommended threshold limits. A partial follow-up assessment may not be required if the initial follow-up assessment addressed above indicates that the levels are already below the recommended limits.
- D. Subsequent periods of air-out and assessment shall continue on approximately two (2) week intervals until all the zones reach acceptable IAQ levels, or an alternative abatement method is decided upon.
- E. After each assessment, a report shall be generated documenting and analyzing the results of the assessment. The report will also contain any recommendations or corrective actions that may be required.

1312.5 POST OCCUPANCY ASSESSMENT. When required, a post-occupancy assessment will be made.

- A. Testing will occur after all of the building is furnished and occupied. The purpose of this test will be to determine if there are unacceptably high levels of VOC's, formaldehyde or CO₂ during period of occupancy and equipment operation (VOC – Volatile Organic Compound).
- B. The post occupancy assessment will include all of the tasks outlined in Paragraph 1312.2 B, plus testing for CO₂ and be included in a Final Building Indoor Air Quality Report.

1312.6 SUMMARY OF ACTIVITIES. The IAQ assessment program will be implemented in a direct and scientific manner to render the DGS construction program, with sensitive and extensive human habitation and

interface, free from all construction and furnishings related irritants and contaminants prior to occupancy. The IAQ standards will be modified over time as the IAQ knowledge and standards in the industry and agencies such as EPA, NIOSH, and OSHA grow and more guidance, based on expanded research, becomes available. All assessment and testing will be performed under the direction of a Certified Industrial Hygienist and Independent Testing Lab.

- A. The Professional shall coordinate with the HVAC system Automatic Temperature Control Contractor to ensure that the building systems are operated as directed, but within limitations to avoid non-compliance with all construction warranties.

SECTION 1313 - SPACE STANDARDS FOR DGS PROJECTS

1313.1 PURPOSE. DGS will participate in the space planning effort for all projects in order to promote a uniform and efficient use of office space throughout all state agencies and to modernize office spaces with the newest proven concepts. DGS through its Commonwealth Consultant will provide guidance and review of office space layouts. Updated DGS space standards will be provided in the future, but the information presented herein should be used until new standards are developed. The current guidelines below are based on the area required for each individual workstation or function. Deviations from the guidelines may be made to accommodate innovative approaches to work space design, special needs and idiosyncrasies of specific projects, but only with the BOPC's approval.

1313.2 STANDARDS FOR OFFICE AREA REQUIREMENTS. Provide the standard space allowances, as listed below, in accordance with DGS Management Directive No. 625-1 and Form STD-564 (Rev. 12-95):

PERSONNEL	STD. ALLOWANCE	SQ. FT./EA.
EXECUTIVE I	25 FT. x 17 FT.	425
EXECUTIVE II	15 FT. x 17 FT.	255
SENIOR MANAGER	15 FT. x 15 FT.	225
MID MGR/PRIVATE OFFICE	10 FT. x 15 FT.	150
SUPERVISOR/TECHNICAL	8 FT. x 12 FT.	96
ANALYST/ADMIN/SECRETARY	8 FT. x 8 FT.	64
CLERICAL/FIELD	6 FT. x 8 FT.	48
Note: The first four (4) categories above are constructed offices, and the last three (3) categories are work stations.		

AUXILIARY AREAS	DETERMINE	SQ. FT./EA.
CONFERENCE ROOM	PER PERSON MEETING	17
RECEPTION	PER PERSON MEETING	7
STORAGE ROOM	AREA REQUIRED	--
LIBRARY	AREA REQUIRED	--
WAITING ROOM	AREA REQUIRED	--
LUNCH ROOM	LEASED SPACE ONLY	4
COMPUTER ROOM	AREA REQUIRED	--
FILE ROOM	AREA REQUIRED	--
MAIL ROOM	AREA REQUIRED	--

SHARED EQUIPMENT		
FILE CABINETS	1.5 FT. x 4.5 FT.	7
TABLES	5 FT. x 5 FT.	25
PC/WP/CRT	5 FT. x 5 FT.	25
COPIERS	5 FT. x 6 FT.	30
STORAGE CABINETS	3 FT. x 3 FT.	9
PLAN FILES	4 FT. x 6.5 FT.	26
BOOKCASES	2 FT. x 3 FT.	6

COAT VALET	2 FT. x 2 FT.	4
LATERAL FILES	2.5 FT. x 4 FT.	10

1312.3 SPACE ALLOCATION PERSONNEL CATEGORIES. The personnel categories equate as follows:

EXECUTIVE I	Cabinet Officer
EXECUTIVE II	Deputy Secretary, Independent Board Commissioner
SENIOR MANAGER	Bureau Director, Executive Director, etc.
MID MGR/PRIVATE OFFICE	Division Chief, Attorney, other position requiring privacy
SUPERVISOR/TECHNICAL	Supervisory positions or technical positions requiring special equipment or positions involving many 2-3 person meetings
ANALYST/ADMIN/SECRETARY	Analyst, Accountant, Programmer, clerical position with administrative duties, etc.
CLERICAL/FIELD	Single task clerical positions, fiscal techs, field staff, etc.

SECTION 1314 - COMMISSIONING

1314.1 COMMISSIONING AGENT. The Department may, at its discretion, decide to contract for an independent Commissioning Agent (CA) to be part of the Design Team. The CA will be contracted directly to the Department, either on a project-specific contract or selected from a Statewide Qualification List, to work on the Project. It is expected that the CA will work with the Professional during the Design Stage to assist in preparing the Design Intent Documents, develop the Commissioning part of the various Prime Contract Specifications, and review the design for testing and operational adequacy based on their experiences. The Professional shall review and incorporate CA comments, as appropriate, into the design documents. The bulk of the CA's work will occur during the latter part of the Project construction, generally covering the development of Pre-functional and Functional Testing Plans, review of O&M Manuals, observing and documenting equipment start up and testing, observing and documenting building operator training, and performing the System Functional Tests. The Commissioning efforts will usually be concerned with HVAC Systems (Air and Water), Automatic Temperature Control Systems, Testing and Balancing the HVAC Systems, Electric Switch Gear, Emergency Generators, Transformers and Automatic Transfer Switches. Other systems and equipment may be included as the Project demands. Functionally, the Commissioning effort will be based on ASHRAE Guideline 02005 and No. 1.1-2007. The Professional shall generally cooperate with the Commissioning Agent (CA) throughout the course of the Project. The Professional shall provide the Commissioning Agent with drawings, specifications, shop drawings, O&M Manuals, and other information pertinent to the selected Commissioning Agent services. The CA shall have access to the drawings, specifications and other information pertinent to the selected CA services within the Project's e-Builder documents folder structure. The Professional shall also attend commissioning meetings, review commissioning reports, and assist with Client Agency training. The CA will provide specification sections (for Divisions 01, 21, 22, 23, 26, 27, and 28) to the Professional, for inclusion into the Project Manual.

1314.2 PROFESSIONAL'S TASKS. Following are representative individual tasks that DGS expects the Professional to perform on projects that include Commissioning. The task descriptions are general in nature and are not intended to be all-inclusive for any assigned project.

A. DESIGN STAGE:

1. In conjunction with the selected Commissioning Agent (CA) and DGS, participate as part of the commissioning team.
2. Provide initial design intent information to the CA.
3. Work with the CA within the commissioning process, so that interfaces between systems are recognized and coordinated. This includes reviewing and incorporating any comments by the CA, based on the preliminary submission documents.
4. Incorporate all required specification sections for commissioning, provide by the CA, in the final submission. Modify the format of these sections as required to match the rest of the specifications. (Alternatively, the Professional could send the CA a copy of the format for the CA to match).
5. Review and incorporate comments on the final plans and specifications provided by the CA.

B. CONSTRUCTION STAGE:

1. Attend the construction phase coordination meetings, organized by the CA.
 2. Review the CA's action list of all deficiencies, and include in the contractor's punch list.
 3. Prior to initiation of TAB work, attend a TAB coordination meeting to review TAB procedures.
 4. Review the CA's TAB verification report.
- C. TRAINING:
1. Participate in the initial Client Agency HVAC training session. The HVAC design professional will conduct this session, with assistance from the electrical design professional, giving an overview of the system, the system design intent, and the reasoning behind the selection of the equipment.
 2. Attend the O&M training sessions.
- D. FINAL DOCUMENTATION:
1. Review the preliminary Final Commissioning Report, and provide any comments to the Design Manager.

SECTION 1315 - SUSTAINABILITY GUIDELINES AND LEED PROJECTS

1315.1 PURPOSE. In order to provide the highest standards of energy efficiency, indoor air quality, and interior working environments in Commonwealth buildings, the BOPC recommends incorporation of the following sustainable materials, systems, and principles in DGS projects, when the Budget allows.

1315.2 SITE PRINCIPLES.

- A. Use of 'Best Management Practices' for stormwater management – See "Pennsylvania Handbook of Best Management Practices for Developing Areas" (Available from the Department of Environmental Protection, Bureau of Watershed Conservation).
- B. Use of pervious pavement reduces water run-off.
- C. Use of landscaping elements to reduce energy consumption and minimize site maintenance.

1315.3 BUILDING PRINCIPLES.

- A. Recycled Post-Consumer Insulation Material is required on all DGS Projects; see the General Conditions of the Construction Contract.
- B. The International Energy Code (Compliance required by PA Department of Labor and Industry); reduces energy consumption through insulation of the entire building envelope.
- C. 'Light Reflective' Roofing Membranes; reduce cooling loads in the building.
- D. Window systems using thermal breaks, low 'E' and insulating glass; reduces heating and cooling loads in the building.
- E. Operable windows; allows use of outside, non-conditioned air.
- F. Daylighting (skylights, atriums, light shelves); used in conjunction with open floor plans, reduces artificial lighting required by allowing natural light to transfuse through the floor area.
- G. Toilet/Shower stall partitions manufactured from recycled plastic or steel.
- H. Recyclable carpet (and carpet with recycled backing material).
- I. Use of tile made with recycled glass.

- J. Use of products with low V.O.C. emissions.
- K. Use of Certified Wood Products (a Pennsylvania renewable resource).
- L. Use of natural energy and elements from the environment (solar, wind, and landscaping) to reduce energy consumption.
- M. Use of recovered coal fly ash in concrete mixtures.
- N. Use of thermal mass of building to reduce heat flow through the building envelope.

1315.6 ELECTRICAL LIGHTING PRINCIPLES.

- A. The use of LED - solid-state source lighting reduces electricity required for lighting. Use fluorescent or HID lighting only where matching existing installations.
- B. Use of electronic scheduling, occupancy sensors, and daylighting controls to regulate electric lights; reduces electricity used.

1315.7 MISCELLANEOUS. Incorporate any other proven, cost effective materials or systems that improve indoor air quality standards, enhance the interior working environment, and contribute to the overall sustainability of the Project.

1315.8 LEED-RATED/CERTIFIED PROJECTS. On certain projects, where determined by the Department, the Professional will be required to design the site/building with the goal of obtaining a specified LEED Rating and/or Certification. It will be the responsibility of the Professional to be thoroughly familiar with the complete LEED Rating System, as developed by the U.S. Green Building Council (USGBC), its design implications, and the processes necessary to achieve the desired rating/ certification. If the Professional is not adequately experienced in the process, the Professional shall hire a specialty LEED consultant to guide its efforts and assure that the Project's goal is achieved.

- A. These projects will necessarily include, but not be limited to: Integrated design efforts, building energy modeling, daylight modeling, green materials investigation, and LEED Certification documentation. These, and all tasks associated with obtaining the LEED Rating, will be considered Additional Services, and the Professional will be entitled to additional compensation for these services.
- B. The required specialty services may be performed by the Professional's own HVAC Consultant (listed in its proposal), if it has the capability. Otherwise, the Professional shall solicit proposals from three (3) qualified firms for specialty services, as required.
- C. These projects will also require full service Building Commissioning. The Department will contract directly with the Commissioning Agent, as described in Section 1314, Commissioning.
- D. Include the DGS Commissioning Agent and the Design Manager as Project Team members.

SECTION 1316 - ELECTRICAL EQUIPMENT WIRING RESPONSIBILITIES

1316.1 WIRING RESPONSIBILITIES. The Professional shall develop the Project design and specifications in accordance with the following:

- A. Electrically Operated Equipment:
 1. The General, HVAC and Plumbing Contractors shall furnish all motors, starters, pushbuttons for local and remote control controllers, pressure switches, aquastats or similar items together with all appurtenances, accessories and control wiring required to operate the equipment furnished under their respective contracts, as necessary to perform the operating functions as specified, shown on the drawings or as otherwise required.

2. The General (.1), HVAC (.2) and Plumbing (.3) Contractors shall set and mount all motors, starters and controls. The Electrical (.4) Contractor shall furnish and install all safety switches and disconnects. All control wiring necessary for the required performance and operation of the equipment shall be installed and connected under each respective and associated contract. Where the starter and/or safety switch is an integral part of the equipment assembly, the assembly shall be furnished with the power wiring being complete between the starter, controller and motor and the Electrical Contractor shall make the power connections only at the unit. The Electrical Contractor shall make the power connections between remote mounted starter/motor control center and the motor.
 3. If procurement requirements necessitate a change in the electrical characteristics of any motor or equipment being furnished under the General, HVAC and Plumbing contracts, the respective Contractor shall first obtain approval of such changes from the Professional and the Department. This same Contractor shall also be responsible for all necessary arrangement and shall pay all costs, if any, for all required changes to the Electrical Contract.
- B. General Requirements: The Electrical Contractor shall furnish, install and connect all power wiring to all equipment and all associated controls and appurtenances provided under the Electrical contract. In addition, the Electrical Contractor shall furnish, install and connect all power wiring to all equipment, associated controls and appurtenances provided under other contracts, unless otherwise specified herein or indicated on the drawings. All necessary and required control wiring for this equipment and systems shall be furnished, installed and connected by the respective Contractors providing the equipment, unless otherwise specified herein or indicated on the drawings.
- C. The Electrical Contractor shall be responsible for proper rotation of 3-phase equipment.
- D. Coordinate with Other Contracts (Add to Other Contract Specifications): All wiring and conduit furnished and installed by the Prime Contractors shall be in strict accordance with the appropriate Sections of the Electrical Specifications. The Prime Contractor shall employ workmen who are skilled in the trades involved for the installation of this work.

SECTION 1317 - ARCHAEOLOGICAL AND HISTORICAL REQUIREMENTS

1317.1 PHMC REVIEW. The Pennsylvania Historical and Museum Commission (PHMC) is required to review all renovation work on State-owned buildings for Historical significance, and all excavation work for Archaeological significance. Prior to the Schematic Design Submission, the Professional shall contact the PHMC for their review of the location and scope of the work.

- A. Inquiries for PHMC review should be initiated by visiting the PHMC website, completing the "Project Review Form: Request to Initiate SHPO Consultation on State and Federal Undertakings", then printing and submitting by mail, with all required information and attachments, to:

Pennsylvania Historical and Museum Commission
State Historic Preservation Office
400 North Street
Commonwealth Keystone Building, 2nd Floor
Harrisburg, PA 17120-0093

- B. Upon completion of their evaluation, PHMC will provide a response letter to the Professional, either indicating a finding of no significance, or requesting additional information.

1317.2 ARCHAEOLOGICAL. For their archaeological review process, PHMC generally needs a map (preferably a portion of a geological survey map) showing the Project location and a brief description of any ground-disturbing activity. Even an activity such as parking lot construction can be significant enough to disturb archaeological resources.

- A. If PHMC's evaluation indicates a potential for archaeological resources, they may ask for a Phase I survey to identify any archaeological resources at the Project location. The survey must be done

by a person or persons whose qualifications meet certain requirements. PHMC has a list of some qualified people, but this list is not exclusive.

- B. Based on the results of the Phase I survey, PHMC may ask for a more intensive Phase II survey to evaluate the archaeological resources at the Project location. In some cases, PHMC may then ask for a Phase III survey to mitigate adverse effects to the site.

1317.3 HISTORICAL. After initial contact with the applicant, PHMC checks whether the building is on, or is eligible for, the National Register. A survey form may be used to determine eligibility. If required, the Professional shall complete the form to the best of its ability; a historical analysis or survey is not required for this.

- A. If National Registry eligibility is determined, PHMC reviews the Project based on the Secretary of the Interior's Standards for Rehabilitation. Each step in the review process may take up to thirty (30) days.

1317.4 PROJECTS FOR PHMC. On Projects for which the Pennsylvania Historical and Museum Commission is the Client Agency, the Professional shall include in the Division 01 - General Requirements, Specification Section 016200 – Historical and Museum Commission Projects – Supplemental Provisions (available at the DGS Internet website and in e-Builder).

- A. The Professional shall consult with the Design Manager to discuss the extent of editing Section 016200 required to suit the particular Project.
- B. All work on Historical facilities shall conform to the Secretary of the Interior's Standards for Historical Preservation Projects.

SECTION 1318 - FLOOD PROTECTION PROJECTS

1318.1 OVERVIEW. Flood Protection Projects are designed as part of the Commonwealth's Flood Protection Program, administered by the Department of Environmental Protection, Bureau of Waterways Engineering (DEP/BWE) or successors. DEP is the Client Agency and the Institution is the Project's local sponsoring municipality(s). The Professional Services provided for these projects differ from typical DGS building projects.

1318.2 HYDROLOGY. The Professional must analyze the watershed hydrology using several methodologies for comparison and must determine peak flood flows and flood hydrographs for at least the 10-, 50-, 100-, and 500-year recurrence intervals. A hydrologic report must be prepared. The design flood frequency (typically 100-year) and the selected hydrologic methodology and discharges must have the approval of DEP/BWE. This approval must be obtained for the Schematic Design Submission.

1318.3 HYDRAULICS. The Professional must analyze existing and proposed conditions using HEC-RAS or other computer modeling acceptable to DEP/BWE. Multiple flood profiles (at least 10-, 50-, 100-, and 500-year) must be analyzed. A hydraulic report, including the HEC-RAS input data, output data, and flood profiles, must be prepared.

1318.4 RIGHTS-OF-WAY (R/W) ACQUISITION DRAWINGS. In addition to contract drawings, the Professional must provide R/W drawings based upon project topography that show project features, project alignment, and permanent and temporary easement lines. These R/W drawings, upon approval of DEP/BWE, are provided to the sponsoring municipality for their use in obtaining lands to construct and maintain the project. R/W drawings must be included in the Design Development Submission. After Design Development approval, the Department may suspend further work on the Project until such time that the sponsoring municipality makes satisfactory progress in land acquisition.

1318.5 FLOOD INSURANCE STUDY IMPACT. Many flood protection projects impact the Flood Insurance Study (FIS) for the municipality(s). Work involved in analyzing the project's impact on the FIS, preparing the information needed to affect any change in the FIS, and obtaining approval of any change from the Federal Emergency Management Agency (FEMA) is considered an Additional Service not covered by compensation for Basic Services.

1317.6 MISCELLANEOUS. Flood protection projects are usually Unit Price contracts, not Lump Sum contracts.

- A. Drawings: Standard drawings size is 24" x 36".
- B. Specifications: DEP/BWE typically provides the Professional with standard text for the Inspector's Office, Supplemental Provisions for Flood Protection Projects, and Technical Specifications portions of the Project Manual.
- C. Permits: The Professional must obtain all state and federal permits. Copies are to be included in the Project Manual.
- D. Construction: DEP/BWE typically provides construction inspection services to DGS for these projects. DGS administers the construction contract and DEP/BWE supplies full time on-site inspectors.

SECTION 1319 – FURNITURE, FIXTURES AND EQUIPMENT (FF&E)

1319.1 OVERVIEW. Loose furniture, fixtures and equipment shall not be purchased with Construction Funds and are not permitted to be included in DGS Construction Projects. Likewise, FF&E items shall not be included in the Probable Construction Cost estimates. The Client Agencies utilize a separate funding source to purchase FF&E items, outside of our Construction Projects.

1319.2 CRITERIA. The Professional, together with the Client Agency, must determine, on an item by item basis, whether a particular item is considered to be "fixed" and thus can be included in the Construction Project documentation and cost, or is considered to be "loose" and may not be included. Generally, items considered to be FF&E are loose, movable, and have no permanent connection to the building structure or utilities. Also, FF&E items depreciate substantially over a shorter time than the building itself.

- A. A basic "rule of thumb" regarding fixed versus FF&E (which is helpful, but not definitive) is this: If the building were turned upside down, if an item falls, it is considered loose or FF&E.
- B. If any item is questionable, ask the Design Manager. It's advisable to review complete equipment lists with the Design Manager.

ORIENTATION CONFERENCE

An Orientation Conference with the Professional and Client Agency is conducted by the Bureau of Pre-Construction (BOPC) to review DGS procedures and confirm the terms of the Agreement for Professional Services (the 'Agreement'). A general review and discussion of the Project will be initiated including but not limited to the following:

- a. Receipt of the Professional's signed and sealed Agreement (all copies) and Certificate of Compliance.
- b. The Base Construction Amount and general description of the Project.
- c. The Time Schedule outlining Design Stage Submission dates and anticipated construction period.
- d. The Professional's responsibilities for Basic Services, anticipated Additional Services, and consultants beyond Basic Services.
- e. Scheduling the Professional's initial design site visit to kick off the project (during negotiations a site visit with the Client Agency should have taken place to confirm the Client Agency's initial program information and project goals).
- f. Use of e-Builder for project administration, invoicing, scheduling, communication, design submissions, work order requests and processing, bidding, construction administration and project files. All project information is to be stored in e-Builder.

The Professional's representative at the Orientation Conference must be empowered to make commitments on the firm's behalf. The Professional shall examine the General Conditions to the Agreement for Professional Services and the BOPC Project Procedure Manual (the 'Manual' or 'PPM') prior to the Orientation Conference, and bring all original copies of the Agreement, signed and sealed, to the Conference. The Professional's Consultants may attend the Orientation Conference at the Professional's discretion. The Professional's representative must be prepared to present, acknowledge, or participate in the following:

- a. Submission of the signed Agreement
- b. Issue of Standard Documents
- c. Project Schedules and Phasing
- d. Project Scope and Base Construction Amount
- e. Program and Project Development
- f. Basic Services and Additional Services
- g. Use of e-Builder
- h. Other Items, as applicable

A package of DGS standard documents will be presented to the Professional, including but not limited to the following:

- a. Orientation Conference Sign-In Sheet
- b. Orientation Summary Sheet
- c. Project Program Statement
- d. Project-Related Handouts

INSTRUCTIONS FOR DGS WEBSITE and e-BUILDER

Step-by-Step Instructions to obtain standard DGS Design and Construction documents from the DGS website:

1. Visit our Web Page at www.dgs.pa.gov
2. See the bar at the top of the home page
3. Click on: **'Businesses'**

'Design & Construction'

'Design' (under the heading Design Documents)

Professional Agreement and General Conditions to the Agreement, 2017 Edition
Project Procedure Manual, 2017 Edition
Project Manual Exhibits, 2017 Edition
Division 1 - General Requirements, 2017 Edition

'Bidding' (under the heading Bidding Documents)

Instructions to Bidders Electronic Bidding, 2016 Edition Sept 2016

'Construction' (under the heading Construction Documents)

Standard Form of Construction Contract and Contract Bond, September 2013 Edition and General Conditions of the Construction Contract, 2017 Edition
Administrative Procedures, 2017 Edition

Step-by-Step Instructions to obtain standard DGS Design and Construction documents from the e-Builder website once registered with e-Builder:

1. Visit e-Builder's website at www.ebuilder.net
2. Select 'Login to e-Builder'
3. Enter user name and password
4. Select the "Projects" tab and select "My Projects" in the pull down menu.
5. Click on the "z-Standard Documentation & Training – PADGS" project name.
6. Once in the project, on the left-hand side of the screen, click on the "Documents" folder under Project Menu.
7. The project's document folder tree will appear. Expand the folder tree to expose all folders. Select or browse the folders to find the desired document(s).

INSTRUCTIONS FOR OBTAINING ADDITIONAL SERVICES WORK ORDERS

1. Additional Services are any and all Professional Services determined by the Department during negotiations and/or after the execution of the Agreement to be necessary for Project completion, but not included as Basic Services. Estimated budgets for pending Additional Services shall be provided by the Professional during Agreement negotiations.
2. The need for Additional Services may be identified by the Department, Professional or Client Agency, but authorization to proceed with the identified services will only come from the Department in the form of a Work Order unless directed otherwise in writing by the Department to proceed and track costs. If the request originated with the Client Agency, a copy of the letter from the Client Agency requesting the additional service should be attached to the Professional's Work Order Proposal.
3. Once the scope of the Additional Services is established, the Professional shall prepare and submit a proposal to the Design Manager by initiating the Work Order Process in e-Builder. The proposal shall include a detailed scope of services, price, pricing back-up, listing of deliverables, and delivery schedule. If the proposal includes services provided by a Consultant, the Professional shall request proposals from at least three (3) qualified firms. Upon receipt of the proposals, the Professional is to attach a cover letter (on company letterhead) containing its evaluation and recommendation, and submit the package through the e-Builder Work Order Process. DGS standard policy is to award to the firm providing the lowest cost proposal. However, if the Professional feels that there are compelling reasons to do otherwise, the Professional may request award to a higher cost firm with an explanation of the reasons to justify the higher cost.
 - a. Note: If the Consultant is listed in the Design Professional Selection Application for Specific Project, or in Exhibit A of the Agreement, and is already a member of the Professional's project team, additional quotes are not mandatory. However, if the Design Manager feels that the Consultant's proposal cost is not competitive, the Design Manager may require the Professional to solicit two (2) or more additional proposals. Discuss each potential Work Order with the Design Manager prior to submitting the proposal.
 - b. The Professional may add up to 10% administrative fee to the Consultant's proposal. No mark-up of reimbursable expenses or the Professional's services is permitted.
4. Depending on the type of Additional Services required and the amount of additional compensation being requested, Work Order compensation may be on a Not-To-Exceed basis or as a Negotiated Lump Sum. Discuss the proposed compensation method with the Design Manager prior to submitting the proposal.
 - a. Lump Sum Proposal: Include a breakdown of hours by task, labor cost, labor multiplier and direct expenses that result in the lump sum amount proposed.
 - b. Not-To-Exceed Proposals: Work Order proposals must include a detailed breakdown of tasks with anticipated personnel, hours and rates. Reimbursable expenses are discouraged, but if included may not exceed current State allowable rates. Per diems are not permitted. The rates approved for the Work Order must be used for invoicing for the work.
5. The Design Manager will review the proposals and conduct negotiations with the Professional as needed through the comments and revision function in the e-Builder process until the scope, price, deliverables, and schedule are agreed upon. Once the scope and price are agreed upon, the Design Manager releases the final Work Order proposal through e-Builder to the Client Agency reviewer for review, comment, and concurrence.
6. If insufficient Project funding exists under the design contingency budget for the requested Work Order amount, the Design Manager will contact the Fiscal Office and work with the Client Agency and the Fiscal Office to obtain a Letter of Commitment (Capital Projects) or an Amended Work Request (Agency Projects) to add funds to the project. The Work Order process cannot proceed without sufficient funding.

7. Once sufficient funding exists, the Design Manager finalizes review of the work order request and action is taken in e-Builder as follows:
 - a. Work Order value \$6,000 or less: Design Manager take the "Reviewed" action and the work order is sent to the Professional for approval through e-Builder.
 - b. Work Order value over \$6,000 but no more than \$25,000: Design Manager sends the Work Order request to the Portfolio Manager for review and approval through e-Builder. Once approved, e-Builder sends the Work Order process to the Professional for approval.
 - c. Work Order value over \$25,000 but no more than \$50,000: Design Manager sends the Work Order request to the Portfolio Manager for review through e-Builder. Once the Portfolio Manager approves the Work Order, it is sent by e-Builder to the BOPC Assistant Director for review and approval. Once approved, e-Builder sends the Work Order process to the Professional for approval.
 - d. Work Order value over \$50,000 but no more than \$100,000: Design Manager initiates the routing of the Work Order request to the Portfolio Manager and BOPC Assistant Director for review and approval through e-Builder. Once approved by the BOPC Assistant Director, the Work Order is sent by e-Builder to the BOPC Director for review and approval. Once approved, e-Builder sends the Work Order process to the Professional for approval.
 - e. Work Order value over \$100,000 but no more than \$200,000: Design Manager initiates the routing of the Work Order to the Portfolio Manager, BOPC Assistant Director and BOPC Director for review and approval through e-Builder. Once approved by the BOPC Director, the Work Order is sent by e-Builder to the Deputy Secretary for review and approval. Once approved, e-Builder sends the Work Order process to the Professional for approval.
 - f. Work Order value over \$200,000: Design Manager initiates the routing of the Work Order to the Portfolio Manager, BOPC Assistant Director, BOPC Director and Deputy Secretary for review and approval through e-Builder. Once approved by the Deputy Secretary, the Work Order is sent by e-Builder to the Secretary for review and approval. Once approved, e-Builder sends the Work Order process to the Professional for approval.
8. The Professional may commence performance of the Additional Services upon approving the Work Order in e-Builder.
9. Upon receipt of the Work Order approval notification by the Professional, the Fiscal Office will process the Work Order in SAP and update the Purchase Order for the Project.
10. See Chapter 1 of the Project Procedures Manual for instructions regarding invoicing for Additional Services.
11. When invoicing for Additional Services, provide the following documentation:
 - a. Lump Sum Work Orders: Description of the services provided and the percentage of each task performed, the invoice amount for each task, cumulative percentage of the completed work and the total amount requested for the invoice period.
 - b. Not-To-Exceed Work Orders: Description of the services provided, the invoice backup including a Work Order Summary Sheet listing all labor hour charged by task, hourly rates as well as the reimbursable expenses breakdown totaling to the total amount requested. Receipts are required for all reimbursable expenses. Charge card receipts are not acceptable. Travel logs are acceptable for mileage. Per Diem rates are not allowed. Compensation limits are listed in the Professional Agreement and in the General Conditions of the Professional Agreement. Include the 10% administrative fee on Consultants' work if allowed by the approved Work Order. No mark-up of reimbursable expenses or the Professional's services is permitted. The required Summary and Expense forms shall be the Professional's/Consultant's standard format but the Department

reserves the right to provide mandatory Work Order templates at some time in the future to be used for invoicing back-up documentation.

12. In the case of Geotechnical Investigations, Quality Assurance Services, Hazardous Materials Surveys, and Land Surveying, DGS has standard Request for Proposal (RFP) formats that the Professional must edit and use for solicitation of consultant services (See Exhibits G1(PC), G1(CS), G2, G3 and H1).
 - a. Design Additional Services (Geotechnical Investigations, Hazardous Materials Surveys, and Land Surveying): The Professional determines when these design Additional Services are required based on its project schedule. Allow a minimum of fourteen (14) calendar days for review and approval of a draft RFP and a minimum of thirteen (30) calendar days for processing a Work Order from the time of proposal submission to receipt of approval. The Professional prepares a draft Request for Proposal (RFP) using the DGS standard format, and submits it via the e-Builder Work Order process to the Design Manager for review and approval. The review and approval of the draft RFP occurs through the comments and revision function in e-Builder. Once the RFP is approved, the Professional solicits and receives quotes and then submits the Work Order proposal as described in Steps 3, 4 and 5 above. The proposal however must be submitted under the same Work Order e-Builder process as the original draft RFP since e-Builder automatically numbers the Work Orders as submitted.
 - b. Construction Additional Services (Quality Assurance Services, Full or Part-time Inspection, and Special Inspections): The draft RFP is to be submitted for review with the Construction Documents (CD) Submission. Review and approval of the RFP will occur during the CD submission review and approval process. Estimated cost of the additional service shall be identified when submitting the draft RFP. Once approved, the Professional shall solicit quotes, prepare a proposal, and submit a proposal via the e-Builder Work Order process during the Project's bidding process.

POINT OF CONTACT TO REVIEW DGS DRAWINGS
FOR OUTSIDE PROFESSIONALS AND CLIENT AGENCIES

The Professional shall make every effort to obtain (As-Built) Record Drawings from the Client Agency and/or the Institution at which the project will take place. However, if adequate existing documents cannot be found, the Professional or the Client Agency may request to review DGS drawings.

Record Drawings for DGS projects are stored in a remote location at the DGS Records Center. Please contact the Design Manager to make arrangements to review existing Record Drawings, as necessary.

The Professional or Client Agency must provide project numbers for the documents they wish to review. The Design Manager will make arrangements for the documents to be pulled from the archives and for the Professional or the Client Agency to visit the DGS Records Center.

Applicable drawings found at the DGS Records Center shall be scanned by the Professional or Client Agency, saved in PDF format, and returned to the Design Manager for refiling. Drawings obtained from the Client Agency and/or the Institution shall also be scanned by the Professional and saved in PDF format. All scanned drawings shall be included with the Construction Documents Submission for the Project.

Projects active at the time DGS converted to electronic submissions (August/September 2015) should have Record Drawings in PDF format in the Department's electronic files or within e-Builder. The Design Manager can search these locations for Record Drawings and upload PDF files to e-Builder or copy PDF files from one e-Builder Project to another.

Note: DGS/Public Works no longer provides printing services.

PROGRAMMING SUBMISSION
PROBABLE CONSTRUCTION COST SUMMARY

Project Number: Phase: Date of Estimate:
 Project Title:
 Location: Client Agency:
 Professional Firm:

OPTION: - % OF BASE CONSTRUCTION AMOUNT

BASE CONSTRUCTION AMOUNT (BCA) \$ -

AREA SUMMARY

Total Improved Site Area	<input type="text"/> - Sq. Ft.
Ground (Building Footprint) Area	<input type="text"/> - Sq. Ft.
Gross Floor Area (New Construction)	<input type="text"/> - Sq. Ft.
Gross Floor Area (Renovations)	<input type="text"/> - Sq. Ft.

*Colored boxes require
Professional's input*

SITE COSTS

A. IMPROVED SITE AREA COST \$ -

BUILDING COSTS

	<u>New Construction</u>	<u>Renovations</u>	
B. CONSTRUCTION COST	\$ <input type="text"/> -	+ \$ <input type="text"/> -	= \$ <input type="text"/> -

C. TOTAL CONSTRUCTION COST (A + B) \$ -

ESCALATION

Midpoint of Construction (tentative date) . . .
 - Months @ - % Inflation / Month = Total - %

D. TOTAL ESCALATION (C x TOTAL %) \$ -

E. ESCALATED TOTAL CONSTRUCTION COST (C + D) \$ -

ANALYSIS

F. PROBABLE CONSTRUCTION COST PERCENTAGE (BCA ÷ E) - %

(Note: Base Bid 1 should be approximately 90% - 95% of the Base Construction Amount)

G. COST PER SQUARE FOOT (E ÷ Total Gross Floor Area) \$ - / Sq. Ft.

Design Professional (printed)

Design Professional (signature)

Date

PROGRAMMING SUBMISSION
GENERAL INFORMATION

Project Number: _____ Phase: _____ Date of Submission: _____
Project Title: _____
Location: _____ Client Agency: _____
Professional Firm: _____

DESCRIBE THE FOLLOWING:

Site (including Zoning)

Utilities

Exterior and Interior Building Materials

HVAC Requirements

Plumbing/Fire Protection Requirements

Electrical Requirements

SCHEMATIC DESIGN SUBMISSION
PROBABLE CONSTRUCTION COST SUMMARY

Project Number: Phase: Date of Estimate:
 Project Title:
 Location: Client Agency:
 Professional Firm:

BASE BID NO: - % OF BASE CONSTRUCTION AMOUNT

BASE CONSTRUCTION AMOUNT (BCA) \$ -

AREA SUMMARY

Total Improved Site Area	<input type="text"/> - Sq. Ft.	Colored boxes require Professional's input
Ground (Building Footprint) Area	<input type="text"/> - Sq. Ft.	
Gross Floor Area (New Construction)	<input type="text"/> - Sq. Ft.	
Gross Floor Area (Renovations)	<input type="text"/> - Sq. Ft.	

SITE COSTS

A. IMPROVED SITE AREA COST \$ -

BUILDING COSTS

	<u>New Construction</u>		<u>Renovations</u>		
General Construction	\$ <input type="text"/> - / Sq. Ft.	+	\$ <input type="text"/> - / Sq. Ft.	=	\$ <input type="text"/> -
HVAC Construction	\$ <input type="text"/> - / Sq. Ft.	+	\$ <input type="text"/> - / Sq. Ft.	=	\$ <input type="text"/> -
Plumbing Construction	\$ <input type="text"/> - / Sq. Ft.	+	\$ <input type="text"/> - / Sq. Ft.	=	\$ <input type="text"/> -
Electrical Construction	\$ <input type="text"/> - / Sq. Ft.	+	\$ <input type="text"/> - / Sq. Ft.	=	\$ <input type="text"/> -
Other	\$ <input type="text"/> - / Sq. Ft.	+	\$ <input type="text"/> - / Sq. Ft.	=	\$ <input type="text"/> -

B. TOTAL BUILDING CONSTRUCTION COST \$ -

C. TOTAL CONSTRUCTION COST (A + B) \$ -

ESCALATION

Midpoint of Construction (tentative date) . . .
 _____ Months @ - % Inflation / Month = Total _____ - %

D. TOTAL ESCALATION (C x TOTAL %) \$ -

E. ESCALATED TOTAL CONSTRUCTION COST (C + D) \$ -

ANALYSIS

F. PROBABLE CONSTRUCTION COST PERCENTAGE (BCA ÷ E) _____ - %

(Note: Base Bid 1 should be approximately 90% - 95% of the Base Construction Amount)

G. COST PER SQUARE FOOT (E ÷ Total Gross Floor Area) \$ - / Sq. Ft.

Design Professional (printed)

Design Professional (signature)

Date

SCHEMATIC DESIGN SUBMISSION
GENERAL CONSTRUCTION

Project Number: _____ Phase: _____ Date of Submission: _____
Project Title: _____
Location: _____ Client Agency: _____
Professional Firm: _____

SITE WORK

Description of Site
Easements and Rights-of-Way
Fences
Landscaping
Grading
Stormwater Management
Driveways, Roads and Parking
Sidewalks
Foundation Drainage
Domestic Water
Fire Protection Water
Sanitary Sewer
Stormwater
Gas
Zoning
Land Development Plan
<i>[add other information as necessary]</i>

SCHEMATIC DESIGN SUBMISSION
GENERAL CONSTRUCTION

Project Number: _____ Phase: _____ Date of Submission: _____

EXTERIOR MATERIALS

ITEM	MATERIALS
Walls	
Chimney	
Wall Facing	
Entrance Steps	
Roof Type	
Roof Insulation	
Roof Material	
Cornice	
Louvers	
Entrance Doors	
Entrance Trim	
Entrance Handrail	
Ornamental Metal	
Window Type	
Window Materials	
Window Glass	
Screens	

SCHEMATIC DESIGN SUBMISSION
GENERAL CONSTRUCTION (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

STAIRS

Item	Stair #	Stair #	Stair #	Stair #

ELEVATORS

Item	Type	Quantity	Capacity	Speed	Controls

TOILET ROOM PARTITIONS AND RECEPTORS

Item	Washroom	All Toilet Rooms	Janitor's Closet

MISCELLANEOUS

Item	Description

SCHEMATIC DESIGN SUBMISSION
GENERAL CONSTRUCTION (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

DESIGN CRITERIA

Proposed Use of Building

Number of Floors

Basement

Full

Partial

None

Provisions for Future Expansion

Vertical

Stories

Lateral

None

Tabulation of Live Loads

Floor

Occupancy

Live Load

- A.
- B.
- C.

Types of Construction (Describe and Discuss Reasons for Selection)

Foundation Type

Bearing Pressure

Location of Expansion Joints

Location of Mechanical and Electrical Equipment Areas

Describe Special Treatment of Mechanical Area for Fire Resistive Requirements, Loads and Vibration Resistance

SCHEMATIC DESIGN SUBMISSION
GENERAL CONSTRUCTION (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

LIFE SAFETY DATA

Occupancy Classification

Total Occupancy

Floor Occupancy

Basement _____ Third _____ Sixth _____

First _____ Fourth _____ Seventh _____

Second _____ Fifth _____ Eighth _____

Type of Construction

Corridor Doors

Fire Doors

Stairway Doors

Lighting Requirements

Corridor

Exit

Protective Equipment Location

Portable Extinguishers
(Size and Type)

Water Source and Pressure

SCHEMATIC DESIGN SUBMISSION
HVAC REQUIREMENTS

Project Number: _____ Phase: _____ Date of Submission: _____

HEATING

SCOPE AND DESIGN CRITERIA

TYPE OF SYSTEM

Fuel

Fuel Storage

VENTILATING

SCOPE AND DESIGN CRITERIA

TYPE OF SYSTEM

AIR-CONDITIONING

SCOPE AND DESIGN CRITERIA

TYPE OF SYSTEM

SYSTEM CONTROLS

MISCELLANEOUS EQUIPMENT AND SPECIAL SYSTEMS

SPECIAL EXHAUST SYSTEMS

HEAT RECOVERY EQUIPMENT

HUMIDITY CONTROL EQUIPMENT

SCHEMATIC DESIGN SUBMISSION
PLUMBING REQUIREMENTS

Project Number: _____ Phase: _____ Date of Submission: _____

PLUMBING

GAS

- Source
- Meter Location
- Building Distribution

WATER

- Source
- Meter Location
- Building Distribution
- Domestic Hot Water

SANITARY SEWAGE

- Building Sewerage
- Disposition of Sewerage

ROOF DRAINAGE

- Roof Drainage
- Disposition

PLUMBING FIXTURES

- Lavatories
- Water Closets
- Urinals
- Other

FIRE PROTECTION

- Water Source and Pressure
 - Sprinklers
 - Standpipes
 - Fire Hose Cabinets
 - Hose
-
-

SCHEMATIC DESIGN SUBMISSION
ELECTRICAL REQUIREMENTS

Project Number: _____ Phase: _____ Date of Submission: _____

ELECTRICAL

INCOMING SERVICES (Coordinate with Respective Utility Companies or Agencies Having Authority)

POWER

Distribution Voltage

Scope

Method and System

Materials

Utilization Voltage(s)

Scope(s)

Method(s) and System(s)

Material(s)

Applicable Rate Schedules

TELEPHONE

OTHERS *[including, but not limited to]*

Central Fire Alarm

Central Control

Data

EMERGENCY SYSTEMS *[including, but not limited to]*

Power

Lighting

Critical Equipment

DESIGN DEVELOPMENT SUBMISSION
PROBABLE CONSTRUCTION COST SUMMARY

Project Number: Phase: Date of Estimate:
 Project Title:
 Location: Client Agency:
 Professional Firm:

BASE BID NO: - % OF BASE CONSTRUCTION AMOUNT

BASE CONSTRUCTION AMOUNT (BCA) \$ -

AREA SUMMARY

Total Improved Site Area	<input type="text"/> - Sq. Ft.	<i>Colored boxes require Professional's input</i>
Ground (Building Footprint) Area	<input type="text"/> - Sq. Ft.	
Gross Floor Area (New Construction)	<input type="text"/> - Sq. Ft.	
Gross Floor Area (Renovations)	<input type="text"/> - Sq. Ft.	

SITE COSTS (from Cost Estimate Breakdown)

A. IMPROVED SITE AREA COST \$ -

BUILDING COSTS (from Cost Estimate Breakdown)

	<u>New Construction</u>		<u>Renovations</u>		
General Construction	\$ <input type="text"/> -	+	\$ <input type="text"/> -	=	\$ <input type="text"/> -
HVAC Construction	\$ <input type="text"/> -	+	\$ <input type="text"/> -	=	\$ <input type="text"/> -
Plumbing Construction	\$ <input type="text"/> -	+	\$ <input type="text"/> -	=	\$ <input type="text"/> -
Electrical Construction	\$ <input type="text"/> -	+	\$ <input type="text"/> -	=	\$ <input type="text"/> -
Other	\$ <input type="text"/> -	+	\$ <input type="text"/> -	=	\$ <input type="text"/> -

B. TOTAL BUILDING CONSTRUCTION COST \$ -

C. TOTAL CONSTRUCTION COST (A + B) \$ -

ESCALATION

Midpoint of Construction (tentative date) . . .
 _____ Months @ _____ % Inflation / Month = Total _____ %

D. TOTAL ESCALATION (C x TOTAL %) \$ -

E. ESCALATED TOTAL CONSTRUCTION COST (C + D) \$ -

ANALYSIS

F. PROBABLE CONSTRUCTION COST PERCENTAGE (BCA ÷ E) _____ %

(Note: Base Bid 1 should be approximately 90% - 95% of the Base Construction Amount)

G. COST PER SQUARE FOOT (E ÷ Total Gross Floor Area) \$ - / Sq. Ft.

Design Professional (printed)

Design Professional (signature) Date

DESIGN DEVELOPMENT SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

GENERAL CONSTRUCTION COST ESTIMATE BREAKDOWN (cont.)

BUILDING CONSTRUCTION WORK

	<u>New Construction</u>	<u>Renovations</u>
General Conditions	\$ _____	\$ _____
Building Demolition	\$ _____	\$ _____
Excavation, Trenching, Backfill	\$ _____	\$ _____
Concrete Work	\$ _____	\$ _____
Brickwork and Masonry	\$ _____	\$ _____
Structural Steel	\$ _____	\$ _____
Miscellaneous Metals	\$ _____	\$ _____
Carpentry and Millwork	\$ _____	\$ _____
Waterproofing and Sheet Metal	\$ _____	\$ _____
Roofing	\$ _____	\$ _____
Doors and Door Frames	\$ _____	\$ _____
Finish Hardware	\$ _____	\$ _____
Glass and Glazing	\$ _____	\$ _____
Windows	\$ _____	\$ _____
Gypsum Wallboard and Plaster	\$ _____	\$ _____
Acoustical Ceilings	\$ _____	\$ _____
Floor Coverings	\$ _____	\$ _____
Painting and Finishing	\$ _____	\$ _____
Specialties	\$ _____	\$ _____
Elevators	\$ _____	\$ _____
Hazardous Materials	\$ _____	\$ _____
Special Construction Items or Equipment	\$ _____	\$ _____
<i>[add other items as necessary]</i>	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
GENERAL CONSTRUCTION TOTAL	\$ _____	\$ _____

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors' overhead and profit, bonds, insurances, etc. as line items. This is the level of detail expected.

DESIGN DEVELOPMENT SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

HVAC & PLUMBING CONSTRUCTION COST ESTIMATE BREAKDOWN

HEATING, VENTILATING, & AIR CONDITIONING WORK

	<u>New Construction</u>	<u>Renovations</u>
HVAC Site Work (Geothermal, Steam, etc.)	\$ _____	\$ _____
HVAC Work in Building	\$ _____	\$ _____
Primary Equipment	\$ _____	\$ _____
Terminal Equipment	\$ _____	\$ _____
Piping	\$ _____	\$ _____
Ductwork	\$ _____	\$ _____
Controls	\$ _____	\$ _____
<i>[add other items as necessary]</i>	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
HVAC CONSTRUCTION TOTAL	\$ _____	\$ _____

PLUMBING WORK

	<u>New Construction</u>	<u>Renovations</u>
Domestic Water Piping	\$ _____	\$ _____
Roof Water Piping	\$ _____	\$ _____
Sanitary Piping	\$ _____	\$ _____
Gas/Vacuum Piping	\$ _____	\$ _____
Plumbing Fixtures	\$ _____	\$ _____
Other Piping	\$ _____	\$ _____
<i>[add other items as necessary]</i>	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
PLUMBING CONSTRUCTION TOTAL	\$ _____	\$ _____

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors' overhead and profit, bonds, insurances, etc. as line items. This is the level of detail expected.

DESIGN DEVELOPMENT SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

ELECTRICAL CONSTRUCTION COST ESTIMATE BREAKDOWN

ELECTRICAL WORK

	<u>New Construction</u>	<u>Renovations</u>
Electrical Service Work (from point of attachment to Utility Company, to and including the main secondary disconnect)	\$ _____	\$ _____
Anticipated Utility Company Fee	\$ _____	\$ _____
Electrical Site Work (site lighting, etc.)	\$ _____	\$ _____
Light and Power Distribution (Building)	\$ _____	\$ _____
Other Systems (Building)	\$ _____	\$ _____
Fire Alarm	\$ _____	\$ _____
Telephone		
Data		
Emergency		
Other		
<i>[add other items as necessary]</i>	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
	\$ _____	\$ _____
ELECTRICAL CONSTRUCTION TOTAL	\$ _____	\$ _____

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors' overhead and profit, bonds, insurances, etc. as line items. This is the level of detail expected.

DESIGN DEVELOPMENT SUBMISSION
GENERAL CONSTRUCTION

Project Number: _____ Phase: _____ Date of Submission: _____

SITE WORK

Description of Site
Easements and Rights-of-Way
Fences
Landscaping
Grading
Stormwater Management
Driveways, Roads and Parking
Sidewalks
Foundation Drainage
Domestic Water
Fire Protection Water
Sanitary Sewer
Stormwater
Gas
Zoning
Land Development Plan
<i>[add other information as necessary]</i>

DESIGN DEVELOPMENT SUBMISSION
GENERAL CONSTRUCTION (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

STAIRS

Item	Stair #	Stair #	Stair #	Stair #
Metal Pan				
Concrete				
Steel				

ELEVATORS

Item	Type	Quantity	Capacity	Speed	Controls
Passenger					
Freight					

TOILET ROOM PARTITIONS AND RECEPTORS

Item	Washroom	All Toilet Rooms	Janitor's Closet

MISCELLANEOUS

Item	Description

DESIGN DEVELOPMENT SUBMISSION
GENERAL CONSTRUCTION (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

DESIGN CRITERIA

Proposed Use of Building			Number of Floors			
Basement <input type="checkbox"/> Full <input type="checkbox"/> Partial <input type="checkbox"/> None			Provisions for Future Expansion <input type="checkbox"/> Vertical <input type="checkbox"/> Stories <input type="checkbox"/> Lateral <input type="checkbox"/> None			

Tabulation of Live Loads

	Floor	Occupancy	Live Load
A.			
B.			
C.			

Types of Construction (Describe and Discuss Reasons for Selection)

Foundation Type	Bearing Pressure
-----------------	------------------

Location of Expansion Joints

Location of Mechanical and Electrical Equipment Areas

Describe Special Treatment of Mechanical Area for Fire Resistive Requirements, Loads and Vibration Resistance

DESIGN DEVELOPMENT SUBMISSION
GENERAL CONSTRUCTION (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

LIFE SAFETY DATA

Occupancy Classification

Total Occupancy

Floor Occupancy

Basement _____ Third _____ Sixth _____

First _____ Fourth _____ Seventh _____

Second _____ Fifth _____ Eighth _____

Type of Construction

Corridor Doors

Fire Doors

Stairway Doors

Lighting Requirements

Corridor

Exit

Protective Equipment Location

Portable Extinguishers
(Size and Type)

Water Source and Pressure

DESIGN DEVELOPMENT SUBMISSION
HVAC REQUIREMENTS

Project Number: _____ Phase: _____ Date of Submission: _____

HEATING

SCOPE AND DESIGN CRITERIA

TYPE OF SYSTEM

Fuel

Fuel Storage

VENTILATING

SCOPE AND DESIGN CRITERIA

TYPE OF SYSTEM

AIR-CONDITIONING

SCOPE AND DESIGN CRITERIA

TYPE OF SYSTEM

SYSTEM CONTROLS

MISCELLANEOUS EQUIPMENT AND SPECIAL SYSTEMS

SPECIAL EXHAUST SYSTEMS

HEAT RECOVERY EQUIPMENT

HUMIDITY CONTROL EQUIPMENT

DESIGN DEVELOPMENT SUBMISSION
PLUMBING REQUIREMENTS

Project Number: _____ Phase: _____ Date of Submission: _____

PLUMBING

GAS

- Source
- Meter Location
- Building Distribution

WATER

- Source
- Meter Location
- Building Distribution
- Domestic Hot Water

SANITARY SEWAGE

- Building Sewerage
- Disposition of Sewerage

ROOF DRAINAGE

- Roof Drainage
- Disposition

PLUMBING FIXTURES

- Lavatories
- Water Closets
- Urinals
- Other

FIRE PROTECTION

- Water Source and Pressure
 - Sprinklers
 - Standpipes
 - Fire Hose Cabinets
 - Hose
-
-

DESIGN DEVELOPMENT SUBMISSION
ELECTRICAL REQUIREMENTS

Project Number: _____ Phase: _____ Date of Submission: _____

POWER

INCOMING SERVICES (Coordinate with Respective Utility Companies or Agencies Having Authority)

POWER

- Distribution Voltage
 - Scope
 - Method and System
 - Materials

- Utilization Voltage(s)
 - Scope(s)
 - Method(s) and System(s)
 - Material(s)

Applicable Rate Schedules

TELEPHONE

OTHERS *[including, but not limited to]*

- Central Fire Alarm

- Central Control

- Data

INTERIOR DISTRIBUTION SYSTEM(S)

- Electrical Characteristics
- Equipment Served ***[including, but not limited to]***
 - Motors
 - Fluorescent Fixtures
 - Incandescent Fixtures
- Materials Employed ***[including, but not limited to]***
 - Conduit and Cable
 - Bus-Duct
 - Panel Boards
 - Circuit Breakers
 - Fuses
 - Motor Control Centers
 - Underfloor Duct

DESIGN DEVELOPMENT SUBMISSION
ELECTRICAL REQUIREMENTS (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

LIGHTING

INTERIOR LIGHTING SYSTEMS

<u>AREA</u>	<u>DESCRIPTION</u>
Office	Lamp Recessed Troffer with Low Brightness Acrylic Lens, Providing _____ F.C.

[add additional as necessary]

INTERIOR LIGHTING SYSTEMS

<u>AREA</u>	<u>DESCRIPTION</u>
Building Floodlighting	Ground Mounted I-Q

[add additional as necessary].

SPECIAL LIGHTING SYSTEMS *[including, but not limited to]*

- Signs
- Stage

MOTORS AND MOTOR CONTROLS

DESIGN DEVELOPMENT SUBMISSION
ELECTRICAL REQUIREMENTS (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

OTHER SYSTEMS

EMERGENCY SYSTEMS *[including, but not limited to]*

- Power
- Lighting
- Critical Equipment

MISCELLANEOUS EQUIPMENT *[including, but not limited to]*

- Kitchen
- Laundry
- Computer
- X-Ray

OTHER *[including, but not limited to]*

- Electrical Space Heating
- Process Heating

INTERIOR MISCELLANEOUS SIGNAL, COMMUNICATION & AUXILIARY SYSTEMS *[including, but not limited to]*

- Clock – Program – Intercom
- Nurses Call
- Security
- Radio – Television
- Fire Alarm (Check Sprinklers)

GROUNDING

LIGHTNING PROTECTION

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION
PROBABLE CONSTRUCTION COST SUMMARY

Project Number: _____ Phase: _____ Date of Estimate: _____
 Project Title: _____
 Location: _____ Client Agency: _____
 Professional Firm: _____

BASE BID NO: _____ - % OF BASE CONSTRUCTION AMOUNT

BASE CONSTRUCTION AMOUNT (BCA) \$ _____

AREA SUMMARY

Total Improved Site Area	_____ - Sq. Ft.	Colored boxes require Professional's input
Ground (Building Footprint) Area	_____ - Sq. Ft.	
Gross Floor Area (New Construction)	_____ - Sq. Ft.	
Gross Floor Area (Renovations)	_____ - Sq. Ft.	

ESCALATION

Midpoint of Construction (tentative date) _____
 _____ Months @ _____ % Inflation / Month = Total _____ %

GENERAL CONSTRUCTION COSTS (from Cost Estimate Breakdown)

	<u>New Construction</u>	<u>Renovations</u>	<u>Current</u>	<u>Escalated</u>
Improved Site Area Cost			\$ _____ -	\$ _____ -
Building Construction Cost				
	\$ _____ -	\$ _____ -	\$ _____ -	\$ _____ -
A. TOTAL GENERAL CONSTRUCTION COST				\$ _____ -

BUILDING SYSTEMS COSTS (from Cost Estimate Breakdown)

	<u>New Construction</u>	<u>Renovations</u>	<u>Current</u>	<u>Escalated</u>
HVAC Construction	\$ _____ -	\$ _____ -	\$ _____ -	\$ _____ -
Plumbing Construction	\$ _____ -	\$ _____ -	\$ _____ -	\$ _____ -
Electrical Construction	\$ _____ -	\$ _____ -	\$ _____ -	\$ _____ -
Other	\$ _____ -	\$ _____ -	\$ _____ -	\$ _____ -
B. TOTAL BUILDING SYSTEMS COST				\$ _____ -

C. TOTAL CONSTRUCTION COST (A + B) \$ _____

ANALYSIS

D. PROBABLE CONSTRUCTION COST PERCENTAGE (BCA ÷ C) - %
 (Note: Base Bid 1 should be approximately 90% - 95% of the Base Construction Amount)
E. COST PER SQUARE FOOT (C ÷ Total Gross Floor Area) \$ _____ - / Sq. Ft.

Design Professional (printed)

Design Professional (signature)

Date

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN

Project Number: _____ Phase: _____ Date of Submission: _____
 Project Title: _____
 Location: _____ Client Agency: _____
 Professional Firm: _____

GENERAL CONSTRUCTION COST ESTIMATE BREAKDOWN

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
SITE CONSTRUCTION								
Site Demolition								
Earthwork								
Paving								
Site Utilities								
IMPROVED SITE AREA COST								
BUILDING CONSTRUCTION – NEW CONSTRUCTION								
General Conditions								
Excavation								
Concrete Work								
Brickwork								
Concrete Block (Size)								
Structural Steel								
Miscellaneous Metals								
Carpentry								
Insulation (Type, Size)								
Roofing								
Doors, Frames								
Windows								
Hardware								
Finishes								
Other								
BUILDING CONSTRUCTION COST – NEW CONSTRUCTION								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors' overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean's Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

GENERAL CONSTRUCTION COST ESTIMATE BREAKDOWN (cont.)

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
BUILDING CONSTRUCTION – RENOVATIONS								
General Conditions								
Excavation								
Concrete Work								
Brickwork								
Concrete Block (Size)								
Structural Steel								
Miscellaneous Metals								
Carpentry								
Insulation (Type, Size)								
Roofing								
Doors, Frames								
Windows								
Hardware								
Finishes								
Other								
BUILDING CONSTRUCTION COST – RENOVATIONS								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors' overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean's Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

HVAC CONSTRUCTION COST ESTIMATE BREAKDOWN

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
HVAC CONSTRUCTION – NEW CONSTRUCTION								
General Conditions								
Excavation		C.Y.						
Backfill		C.Y.						
Rock Excavation		C.Y.						
Concrete Anchors		Ea.						
Misc. Concrete Sleeves		-----						
Size		Ea.						
Painting		S.F.						
Reciprocating Chillers		Ea.						
Cooling Towers		Ea.						
Water Treatment		Hr.						
Cond. Water Pumps		Ea.						
Steel Pipe & Fittings		-----						
Size and Type		L.F.						
Copper Tubing and Fittings		-----						
Size and Type		L.F.						
Ball Expansion Joints		-----						
Size		Ea.						
Insulation		-----						
Size		L.F.						
Other								
Other								
HVAC CONSTRUCTION COST – NEW CONSTRUCTION								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors' overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean's Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

HVAC CONSTRUCTION COST ESTIMATE BREAKDOWN (cont.)

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
HVAC CONSTRUCTION – RENOVATIONS								
General Conditions								
Excavation		C.Y.						
Backfill		C.Y.						
Rock Excavation		C.Y.						
Concrete Anchors		Ea.						
Misc. Concrete Sleeves		-----						
Size		Ea.						
Painting		S.F.						
Reciprocating Chillers		Ea.						
Cooling Towers		Ea.						
Water Treatment		Hr.						
Cond. Water Pumps		Ea.						
Steel Pipe & Fittings		-----						
Size and Type		L.F.						
Copper Tubing and Fittings		-----						
Size and Type		L.F.						
Ball Expansion Joints		-----						
Size		Ea.						
Insulation		-----						
Size		L.F.						
Other								
Other								
HVAC CONSTRUCTION COST – RENOVATIONS								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors' overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean's Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

PLUMBING CONSTRUCTION COST ESTIMATE BREAKDOWN

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
PLUMBING CONSTRUCTION – NEW CONSTRUCTION								
General Conditions								
Excavation		C.Y.						
Backfill		C.Y.						
Trench Rock		C.Y.						
Manholes		Ea.						
Thrust Blocks		Ea.						
Sleeves – Size		Ea.						
Gate Valves – Size		Ea.						
Globe Valves – Size		Ea.						
Check Valves – Size		Ea.						
Soil Pipe and Fittings –SIZES		L.F.						
VCP – Sizes		L.F.						
Galv. Stl. Pipe & Fittings (Sizes)		L.F.						
Copper Tubing & Fittings (Sizes)		L.F.						
C.I. Water Lines & Fittings (Sizes)		-----						
Tapping Sleeve and Valve		Ea.						
Thermometers & Gauges		Ea.						
Circulating Pumps		Ea.						
Shock Absorbers		Ea.						
Cleanouts – Size		Ea.						
Fire Protection								
Other								
PLUMBING CONSTRUCTION COST – NEW CONSTRUCTION								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors’ overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean’s Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

PLUMBING CONSTRUCTION COST ESTIMATE BREAKDOWN (cont.)

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
PLUMBING CONSTRUCTION – RENOVATIONS								
General Conditions								
Excavation		C.Y.						
Backfill		C.Y.						
Trench Rock		C.Y.						
Manholes		Ea.						
Thrust Blocks		Ea.						
Sleeves – Size		Ea.						
Gate Valves – Size		Ea.						
Globe Valves – Size		Ea.						
Check Valves – Size		Ea.						
Soil Pipe and Fittings –SIZES		L.F.						
VCP – Sizes		L.F.						
Galv. Stl. Pipe & Fittings (Sizes)		L.F.						
Copper Tubing & Fittings (Sizes)		L.F.						
C.I. Water Lines & Fittings (Sizes)		-----						
Tapping Sleeve and Valve		Ea.						
Thermometers & Gauges		Ea.						
Circulating Pumps		Ea.						
Shock Absorbers		Ea.						
Cleanouts – Size		Ea.						
Fire Protection								
Other								
PLUMBING CONSTRUCTION COST – RENOVATIONS								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors’ overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean’s Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

ELECTRICAL CONSTRUCTION COST ESTIMATE BREAKDOWN

Item Description SERVICE AND FEEDERS	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
ELECTRICAL CONSTRUCTION – NEW CONSTRUCTION								
Type & Voltage – Main Service Disconnect		Ea.						
Type /Size – Voltage Distribution Board		Ea.						
Type/Size – Voltage Indoor Substation		Ea.						
Type/Size – Voltage Distribution Panel		Ea.						
Type/Size – Voltage Power Panel		Ea.						
Type/Size – Voltage Lighting Panel		Ea.						
Type/Size – Voltage Transformers		Ea.						
Type/Size – Conduit		L.F.						
Type/Size – Voltage Wire and Cable		M/Ft.						
Type/Size – Conduit Fittings		Ea.						
Type/Size – Conduit Supports		Ea.						
Type/Size – Pull and Junction Box		Ea.						
Type/Size – Wall and Floor Sleeves		Ea.						
Type/Size – Emergency Panel		Ea.						
Type/Size – Norm-Eng. Panel		Ea.						
Type/Size – Wireway		Ft.						
Type/Size – Wireway and Fittings		Ea.						
Type/Size – Cable Tray		Ft.						
Type/Size – Cable Tray Fittings		Ea.						
Type/Size – Voltage Bus Duct – Feeder		Ft.						
Type/Size – Voltage Bus Duct Fittings		Ea.						
Other								
ELECTRICAL CONSTRUCTION COST – NEW CONSTRUCTION								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors’ overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean’s Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

ELECTRICAL CONSTRUCTION COST ESTIMATE BREAKDOWN (cont.)

Item Description SERVICE AND FEEDERS	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
ELECTRICAL CONSTRUCTION – RENOVATIONS								
Type & Voltage – Main Service Disconnect		Ea.						
Type /Size – Voltage Distribution Board		Ea.						
Type/Size – Voltage Indoor Substation		Ea.						
Type/Size – Voltage Distribution Panel		Ea.						
Type/Size – Voltage Power Panel		Ea.						
Type/Size – Voltage Lighting Panel		Ea.						
Type/Size – Voltage Transformers		Ea.						
Type/Size – Conduit		L.F.						
Type/Size – Voltage Wire and Cable		M/Ft.						
Type/Size – Conduit Fittings		Ea.						
Type/Size – Conduit Supports		Ea.						
Type/Size – Pull and Junction Box		Ea.						
Type/Size – Wall and Floor Sleeves		Ea.						
Type/Size – Emergency Panel		Ea.						
Type/Size – Norm-Eng. Panel		Ea.						
Type/Size – Wireway		Ft.						
Type/Size – Wireway and Fittings		Ea.						
Type/Size – Cable Tray		Ft.						
Type/Size – Cable Tray Fittings		Ea.						
Type/Size – Voltage Bus Duct – Feeder		Ft.						
Type/Size – Voltage Bus Duct Fittings		Ea.						
Other								
ELECTRICAL CONSTRUCTION COST – RENOVATIONS								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors’ overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean’s Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

CONSTRUCTION DOCUMENTS SUBMISSION
PROBABLE CONSTRUCTION COST SUMMARY

Project Number: _____ Phase: _____ Date of Estimate: _____
 Project Title: _____
 Location: _____ Client Agency: _____
 Professional Firm: _____

BASE BID NO: _____ - % OF BASE CONSTRUCTION AMOUNT

BASE CONSTRUCTION AMOUNT (BCA) \$ _____

AREA SUMMARY

Total Improved Site Area	_____ - Sq. Ft.	Colored boxes require Professional's input
Ground (Building Footprint) Area	_____ - Sq. Ft.	
Gross Floor Area (New Construction)	_____ - Sq. Ft.	
Gross Floor Area (Renovations)	_____ - Sq. Ft.	

ESCALATION

Midpoint of Construction (tentative date) _____
 _____ Months @ _____ - % Inflation / Month = Total _____ - %

GENERAL CONSTRUCTION COSTS (from Cost Estimate Breakdown)

	<u>New Construction</u>	<u>Renovations</u>	<u>Current</u>	<u>Escalated</u>
Improved Site Area Cost			\$ _____ -	\$ _____ -
Building Construction Cost				
	\$ _____ -	\$ _____ -	\$ _____ -	\$ _____ -
A. TOTAL GENERAL CONSTRUCTION COST				\$ _____ -

BUILDING SYSTEMS COSTS (from Cost Estimate Breakdown)

	<u>New Construction</u>	<u>Renovations</u>	<u>Current</u>	<u>Escalated</u>
HVAC Construction	\$ _____ -	\$ _____ -	\$ _____ -	\$ _____ -
Plumbing Construction	\$ _____ -	\$ _____ -	\$ _____ -	\$ _____ -
Electrical Construction	\$ _____ -	\$ _____ -	\$ _____ -	\$ _____ -
Other	\$ _____ -	\$ _____ -	\$ _____ -	\$ _____ -
B. TOTAL BUILDING SYSTEMS COST				\$ _____ -

C. TOTAL CONSTRUCTION COST (A + B) \$ _____

ANALYSIS

D. PROBABLE CONSTRUCTION COST PERCENTAGE (BCA ÷ C) - %
 (Note: Base Bid 1 should be approximately 90% - 95% of the Base Construction Amount)

E. COST PER SQUARE FOOT (C ÷ Total Gross Floor Area) \$ _____ - / Sq. Ft.

Design Professional (printed)

Design Professional (signature)

Date

CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN

Project Number: _____ Phase: _____ Date of Submission: _____
 Project Title: _____
 Location: _____ Client Agency: _____
 Professional Firm: _____

GENERAL CONSTRUCTION COST ESTIMATE BREAKDOWN

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
SITE CONSTRUCTION								
Site Demolition								
Earthwork								
Paving								
Site Utilities								
IMPROVED SITE AREA COST								
BUILDING CONSTRUCTION – NEW CONSTRUCTION								
General Conditions								
Excavation								
Concrete Work								
Brickwork								
Concrete Block (Size)								
Structural Steel								
Miscellaneous Metals								
Carpentry								
Insulation (Type, Size)								
Roofing								
Doors, Frames								
Windows								
Hardware								
Finishes								
Other								
BUILDING CONSTRUCTION COST – NEW CONSTRUCTION								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors' overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean's Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

**CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)**

Project Number: _____ Phase: _____ Date of Submission: _____

GENERAL CONSTRUCTION COST ESTIMATE BREAKDOWN (cont.)

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
BUILDING CONSTRUCTION – RENOVATIONS								
General Conditions								
Excavation								
Concrete Work								
Brickwork								
Concrete Block (Size)								
Structural Steel								
Miscellaneous Metals								
Carpentry								
Insulation (Type, Size)								
Roofing								
Doors, Frames								
Windows								
Hardware								
Finishes								
Other								
BUILDING CONSTRUCTION COST – RENOVATIONS								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors' overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean's Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

HVAC CONSTRUCTION COST ESTIMATE BREAKDOWN

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
HVAC CONSTRUCTION – NEW CONSTRUCTION								
General Conditions								
Excavation		C.Y.						
Backfill		C.Y.						
Rock Excavation		C.Y.						
Concrete Anchors		Ea.						
Misc. Concrete Sleeves		-----						
Size		Ea.						
Painting		S.F.						
Reciprocating Chillers		Ea.						
Cooling Towers		Ea.						
Water Treatment		Hr.						
Cond. Water Pumps		Ea.						
Steel Pipe & Fittings		-----						
Size and Type		L.F.						
Copper Tubing and Fittings		-----						
Size and Type		L.F.						
Ball Expansion Joints		-----						
Size		Ea.						
Insulation		-----						
Size		L.F.						
Other								
Other								
HVAC CONSTRUCTION COST – NEW CONSTRUCTION								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors' overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean's Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

HVAC CONSTRUCTION COST ESTIMATE BREAKDOWN (cont.)

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
HVAC CONSTRUCTION – RENOVATIONS								
General Conditions								
Excavation		C.Y.						
Backfill		C.Y.						
Rock Excavation		C.Y.						
Concrete Anchors		Ea.						
Misc. Concrete Sleeves		-----						
Size		Ea.						
Painting		S.F.						
Reciprocating Chillers		Ea.						
Cooling Towers		Ea.						
Water Treatment		Hr.						
Cond. Water Pumps		Ea.						
Steel Pipe & Fittings		-----						
Size and Type		L.F.						
Copper Tubing and Fittings		-----						
Size and Type		L.F.						
Ball Expansion Joints		-----						
Size		Ea.						
Insulation		-----						
Size		L.F.						
Other								
Other								
HVAC CONSTRUCTION COST – RENOVATIONS								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors' overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean's Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

PLUMBING CONSTRUCTION COST ESTIMATE BREAKDOWN

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
PLUMBING CONSTRUCTION – NEW CONSTRUCTION								
General Conditions								
Excavation		C.Y.						
Backfill		C.Y.						
Trench Rock		C.Y.						
Manholes		Ea.						
Thrust Blocks		Ea.						
Sleeves – Size		Ea.						
Gate Valves – Size		Ea.						
Globe Valves – Size		Ea.						
Check Valves – Size		Ea.						
Soil Pipe and Fittings –SIZES		L.F.						
VCP – Sizes		L.F.						
Galv. Stl. Pipe & Fittings (Sizes)		L.F.						
Copper Tubing & Fittings (Sizes)		L.F.						
C.I. Water Lines & Fittings (Sizes)		-----						
Tapping Sleeve and Valve		Ea.						
Thermometers & Gauges		Ea.						
Circulating Pumps		Ea.						
Shock Absorbers		Ea.						
Cleanouts – Size		Ea.						
Fire Protection								
Other								
PLUMBING CONSTRUCTION COST – NEW CONSTRUCTION								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors’ overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean’s Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

PLUMBING CONSTRUCTION COST ESTIMATE BREAKDOWN (cont.)

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
PLUMBING CONSTRUCTION – RENOVATIONS								
General Conditions								
Excavation		C.Y.						
Backfill		C.Y.						
Trench Rock		C.Y.						
Manholes		Ea.						
Thrust Blocks		Ea.						
Sleeves – Size		Ea.						
Gate Valves – Size		Ea.						
Globe Valves – Size		Ea.						
Check Valves – Size		Ea.						
Soil Pipe and Fittings –Sizes		L.F.						
VCP – Sizes		L.F.						
Galv. Stl. Pipe & Fittings (Sizes)		L.F.						
Copper Tubing & Fittings (Sizes)		L.F.						
C.I. Water Lines & Fittings (Sizes)		-----						
Tapping Sleeve and Valve		Ea.						
Thermometers & Gauges		Ea.						
Circulating Pumps		Ea.						
Shock Absorbers		Ea.						
Cleanouts – Size		Ea.						
Fire Protection								
Other								
PLUMBING CONSTRUCTION COST – RENOVATIONS								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors’ overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean’s Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

ELECTRICAL CONSTRUCTION COST ESTIMATE BREAKDOWN

Item Description SERVICE AND FEEDERS	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
ELECTRICAL CONSTRUCTION – NEW CONSTRUCTION								
Type & Voltage – Main Service Disconnect		Ea.						
Type /Size – Voltage Distribution Board		Ea.						
Type/Size – Voltage Indoor Substation		Ea.						
Type/Size – Voltage Distribution Panel		Ea.						
Type/Size – Voltage Power Panel		Ea.						
Type/Size – Voltage Lighting Panel		Ea.						
Type/Size – Voltage Transformers		Ea.						
Type/Size – Conduit		L.F.						
Type/Size – Voltage Wire and Cable		M/Ft.						
Type/Size – Conduit Fittings		Ea.						
Type/Size – Conduit Supports		Ea.						
Type/Size – Pull and Junction Box		Ea.						
Type/Size – Wall and Floor Sleeves		Ea.						
Type/Size – Emergency Panel		Ea.						
Type/Size – Norm-Eng. Panel		Ea.						
Type/Size – Wireway		Ft.						
Type/Size – Wireway and Fittings		Ea.						
Type/Size – Cable Tray		Ft.						
Type/Size – Cable Tray Fittings		Ea.						
Type/Size – Voltage Bus Duct – Feeder		Ft.						
Type/Size – Voltage Bus Duct Fittings		Ea.						
Other								
ELECTRICAL CONSTRUCTION COST – NEW CONSTRUCTION								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors’ overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean’s Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

CONSTRUCTION DOCUMENTS SUBMISSION
COST ESTIMATE BREAKDOWN (cont.)

Project Number: _____ Phase: _____ Date of Submission: _____

ELECTRICAL CONSTRUCTION COST ESTIMATE BREAKDOWN (cont.)

Item Description SERVICE AND FEEDERS	Quantities		Material Cost		Labor Cost		Total Estimate	
	Qty.	Unit	Unit	Total	Unit	Total	Unit	Total
ELECTRICAL CONSTRUCTION – RENOVATIONS								
Type & Voltage – Main Service Disconnect		Ea.						
Type /Size – Voltage Distribution Board		Ea.						
Type/Size – Voltage Indoor Substation		Ea.						
Type/Size – Voltage Distribution Panel		Ea.						
Type/Size – Voltage Power Panel		Ea.						
Type/Size – Voltage Lighting Panel		Ea.						
Type/Size – Voltage Transformers		Ea.						
Type/Size – Conduit		L.F.						
Type/Size – Voltage Wire and Cable		M/Ft.						
Type/Size – Conduit Fittings		Ea.						
Type/Size – Conduit Supports		Ea.						
Type/Size – Pull and Junction Box		Ea.						
Type/Size – Wall and Floor Sleeves		Ea.						
Type/Size – Emergency Panel		Ea.						
Type/Size – Norm-Eng. Panel		Ea.						
Type/Size – Wireway		Ft.						
Type/Size – Wireway and Fittings		Ea.						
Type/Size – Cable Tray		Ft.						
Type/Size – Cable Tray Fittings		Ea.						
Type/Size – Voltage Bus Duct – Feeder		Ft.						
Type/Size – Voltage Bus Duct Fittings		Ea.						
Other								
ELECTRICAL CONSTRUCTION COST – RENOVATIONS								

Note: The sample breakdown shown is for instruction only. This breakdown shall include all General Conditions costs, Contractors’ overhead and profit, bonds, insurances, etc. as line items. Other formats, such as Mean’s Construction Estimate forms giving equivalent unit cost breakdowns may be submitted. This is the level of detail expected.

PROGRAMMING SUBMISSION CHECKLIST
(e-Builder)

1	<input type="checkbox"/> Programming Documents (include site and building space requirements) – single PDF file
2	<input type="checkbox"/> Conceptual Design Drawings (multiple options, as required) – single PDF file
3	<input type="checkbox"/> Programming Submission Probable Construction Cost Summaries (Exhibit B1) <input type="checkbox"/> Concept Option 1 – single PDF file <input type="checkbox"/> Concept Option 2 – single PDF file <input type="checkbox"/> Concept Option 3 – single PDF file
4	<input type="checkbox"/> Programming Submission Project Information Sheets (Exhibit B2) – single PDF file
5	<input type="checkbox"/> Statement of Expected Availability of Required Utilities (include List of Utility Approvals – Status Report (Exhibit F4)) – single PDF file for each Utility and Exhibit F4 <input type="checkbox"/> Sanitary Sewer <input type="checkbox"/> Water <input type="checkbox"/> Gas <input type="checkbox"/> Electric <input type="checkbox"/> Telephone <input type="checkbox"/> TV Cable <input type="checkbox"/> Other (Storm Sewer, Steam, etc.)
6	<input type="checkbox"/> Report on Site Restrictions (include written narrative and List of Required Regulatory Approvals/Permits – Status Report (Exhibit F3)) – single PDF file
7	<input type="checkbox"/> Proposed Project Schedule – single PDF file
8	<input type="checkbox"/> Photographs of Proposed Site of New Buildings/Additions and/or Areas of Interior Renovations – single PDF file
9	<input type="checkbox"/> Report on Status of LEED Efforts (if applicable) – single PDF file
10	<input type="checkbox"/> Report on Status of Current and Anticipated Additional Services – single PDF file
11	<input type="checkbox"/> Additional Items (as applicable) – single PDF file for each item <input type="checkbox"/> Contact the Design Manager for directions on which e-Builder documents file folder to place each item. Upload file(s) under the e-Builder “Attached Documents” tab
12	<input type="checkbox"/> Explanation for Missing Items – Add text to comment box in e-Builder

Note: For more detailed descriptions of the items listed above, see Chapter 3 of the BOPC Project Procedure Manual.

PROGRAMMING/SCHEMATIC DESIGN SUBMISSION CHECKLIST**(e-Builder)**

1	<input type="checkbox"/> Programming Documents (include site and building space requirements) – single PDF file
2	<input type="checkbox"/> Code Review and Analysis – single PDF file
3	<input type="checkbox"/> Schematic Design Submission Probable Construction Cost Summaries (Exhibit B3) <ul style="list-style-type: none"> <input type="checkbox"/> Base Bid 1 – single PDF file <input type="checkbox"/> Base Bid 2 – single PDF file <input type="checkbox"/> Base Bid 3 – single PDF file
4	<input type="checkbox"/> Schematic Design Project Information Sheets (Exhibit B4) – single PDF file
5	<input type="checkbox"/> Schematic Design Drawings w/ Cover Sheet – single PDF file
6	<input type="checkbox"/> Draft Project Manual (provide only cover page and table of contents) – single PDF file
7	<input type="checkbox"/> One completed technical specification section – single PDF file.
8	<input type="checkbox"/> Notification Letters to All Utility Companies (include estimated loads, telephone call reports, emails, reply letters (if available), and List of Utility Approvals – Status Report (Exhibit F4)) – single PDF file for each Utility and Exhibit F4 <ul style="list-style-type: none"> <input type="checkbox"/> Sanitary Sewer <input type="checkbox"/> Water <input type="checkbox"/> Gas <input type="checkbox"/> Electric <input type="checkbox"/> Telephone <input type="checkbox"/> TV Cable <input type="checkbox"/> Other (Storm Sewer, Steam, etc.)
9	<input type="checkbox"/> Report on Site Restrictions (include written narrative) – single PDF file
10	<input type="checkbox"/> Fuel Feasibility Study (when requested) – single PDF file
11	<input type="checkbox"/> Coal Fuel Non-Use Justification Letter (if applicable) – single PDF file
12	<input type="checkbox"/> Structural Engineer’s Initial Subsurface and Related Site Investigation Reports – single PDF file
13	<input type="checkbox"/> Professional’s Request for Proposals for Pre-Construction Geotechnical Services – single PDF file
14	<input type="checkbox"/> Preliminary Stormwater Report – single PDF file
15	<input type="checkbox"/> List of Required Regulatory Approvals/Permits – Status Report (Exhibit F3) – single PDF file
16	<input type="checkbox"/> Copies of All Applications for Approvals/Permits Submitted During this Design Period – single PDF file
17	<input type="checkbox"/> Copies of All Approvals/Permits Received During this Design Period – single PDF file
18	<input type="checkbox"/> Initial Contact Letter to Pennsylvania Historical and Museum Commission (PHMC) – single PDF file
19	<input type="checkbox"/> Proposed Project Schedule – single PDF file
20	<input type="checkbox"/> Report on Status of LEED Efforts (if applicable) – single PDF file
21	<input type="checkbox"/> Report on Status of Current and Anticipated Additional Services – single PDF file
22	<input type="checkbox"/> Photographs of Proposed Site of New Buildings/Additions and/or Areas of Interior Renovations – single PDF file

23	<input type="checkbox"/> Additional Items (identified in Chapter 4 of the BOPC Project Procedure Manual and as applicable) – single PDF file for each item <input type="checkbox"/> Contact the Design Manager for directions on which e-Builder documents file folder to place each item. Upload file(s) in e-Builder under the “Attached Documents” tab
24	<input type="checkbox"/> Explanation for Missing Items – Add text to comment box in e-Builder

Note: For more detailed descriptions of the items listed above, see Chapters 3 and 4 of the BOPC Project Procedure Manual.

SCHEMATIC DESIGN SUBMISSION CHECKLIST**(e-Builder)**

1	<input type="checkbox"/> Code Review and Analysis – single PDF file
2	<input type="checkbox"/> Schematic Design Submission Probable Construction Cost Summaries (Exhibit B3) <ul style="list-style-type: none"> <input type="checkbox"/> Base Bid 1 – single PDF file <input type="checkbox"/> Base Bid 2 – single PDF file <input type="checkbox"/> Base Bid 3 – single PDF file
3	<input type="checkbox"/> Schematic Design Project Information Sheets (Exhibit B4) – single PDF file
4	<input type="checkbox"/> Schematic Design Drawings w/ Cover Sheet – single PDF file
5	<input type="checkbox"/> Draft Project Manual (provide only cover page and table of contents) – single PDF file
6	<input type="checkbox"/> One completed technical specification section – single PDF file.
7	<input type="checkbox"/> Notification Letters to All Utility Companies (include estimated loads, telephone call reports, emails, reply letters (if available), and List of Utility Approvals – Status Report (Exhibit F4)) – single PDF file for each Utility and Exhibit F4 <ul style="list-style-type: none"> <input type="checkbox"/> Sanitary Sewer <input type="checkbox"/> Water <input type="checkbox"/> Gas <input type="checkbox"/> Electric <input type="checkbox"/> Telephone <input type="checkbox"/> TV Cable <input type="checkbox"/> Other (Storm Sewer, Steam, etc.)
8	<input type="checkbox"/> Fuel Feasibility Study (when requested) – single PDF file
9	<input type="checkbox"/> Coal Fuel Non-Use Justification Letter (if applicable) – single PDF file
10	<input type="checkbox"/> Structural Engineer’s Initial Subsurface and Related Site Investigation Reports – single PDF file
11	<input type="checkbox"/> Professional’s Request for Proposals for Pre-Construction Geotechnical Services – single PDF file
12	<input type="checkbox"/> Preliminary Stormwater Report – single PDF file
13	<input type="checkbox"/> List of Required Regulatory Approvals/Permits – Status Report (Exhibit F3) – single PDF file
14	<input type="checkbox"/> Copies of All Applications for Approvals/Permits Submitted During this Design Period – single PDF file
15	<input type="checkbox"/> Copies of All Approvals/Permits Received During this Design Period – single PDF file
16	<input type="checkbox"/> Initial Contact Letter to Pennsylvania Historical and Museum Commission (PHMC) – single PDF file
17	<input type="checkbox"/> Proposed Project Schedule – single PDF file
18	<input type="checkbox"/> Report on Status of LEED Efforts (if applicable) – single PDF file
19	<input type="checkbox"/> Report on Status of Current and Anticipated Additional Services – single PDF file
22	<input type="checkbox"/> Photographs of Proposed Site of New Buildings/Additions and/or Areas of Interior Renovations – single PDF file
23	<input type="checkbox"/> Additional Items (identified in Chapter 4 of the BOPC Project Procedure Manual and as applicable) – single PDF file for each item <input type="checkbox"/> Contact the Design Manager for directions on which e-Builder documents file folder to place each item. Upload file(s) in e-Builder under the “Attached Documents” tab.

24	<input type="checkbox"/> Explanation for Missing Items and Detailed Explanation for Review Comments from previous Design Submission when not fully complied with in this Submission – Add text to comment box in e-Builder
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Note: For more detailed descriptions of the items listed above, see Chapter 4 of the BOPC Project Procedure Manual.

DESIGN DEVELOPMENT SUBMISSION CHECKLIST**(e-Builder)**

1	<input type="checkbox"/> Code Review and Analysis – single PDF file
2	Design Development Submission Probable Construction Cost Summaries (Exhibit B5) <input type="checkbox"/> Base Bid 1 – single PDF file <input type="checkbox"/> Base Bid 2 – single PDF file <input type="checkbox"/> Base Bid 3 – single PDF file
3	<input type="checkbox"/> Design Development Project Information Sheets (Exhibit B6) – single PDF file
4	<input type="checkbox"/> Design Development Design Drawings w/ Cover Sheet – single PDF file
5	<input type="checkbox"/> Draft Project Manual (include cover page, table of contents, Division 1 and all technical specification sections) – single PDF file
6	Confirmation Letters from All Utility Companies (include List of Utility Approvals – Status Report (Exhibit F4)) – single PDF file for each Utility and Exhibit F4 <input type="checkbox"/> Sanitary Sewer <input type="checkbox"/> Water <input type="checkbox"/> Gas <input type="checkbox"/> Electric <input type="checkbox"/> Telephone <input type="checkbox"/> TV Cable <input type="checkbox"/> Other (Storm Sewer, Steam, etc.)
7	<input type="checkbox"/> List of Required Regulatory Approvals/Permits – Status Report (Exhibit F3) – single PDF file
8	<input type="checkbox"/> Copies of All Applications for Approvals/Permits Submitted During this Design Period – single PDF file
9	<input type="checkbox"/> Copies of All Approvals/Permits Received During this Design Period – single PDF file
10	<input type="checkbox"/> Geotechnical Investigation and Geotechnical Report – single PDF file
11	<input type="checkbox"/> Utility Subsurface Investigation Report (if applicable) – single PDF File
12	<input type="checkbox"/> Structural Engineer’s Report on Selection of Structural & Foundation Systems – single PDF file
13	Preliminary Engineering Calculations – single PDF for each Discipline <input type="checkbox"/> Sanitary <input type="checkbox"/> Structural <input type="checkbox"/> HVA <input type="checkbox"/> Water <input type="checkbox"/> Plumbing <input type="checkbox"/> Fire Protection <input type="checkbox"/> Electrical <input type="checkbox"/> Other
14	<input type="checkbox"/> Final Stormwater Report – single PDF file
15	<input type="checkbox"/> Final Erosion and Sedimentation Control Report – single PDF file
16	<input type="checkbox"/> Report on Hazardous Materials Survey Results – single PDF file
17	<input type="checkbox"/> Response Letter from Pennsylvania Historical and Museum Commission (PHMC) – single PDF file
18	<input type="checkbox"/> Updated Project Schedule – single PDF file
19	<input type="checkbox"/> Report on Status of LEED Efforts (if applicable) – single PDF file
20	<input type="checkbox"/> Report on Status of Current and Anticipated Additional Services – single PDF file
21	<input type="checkbox"/> Additional Items (identified in Chapter 5 of the BOPC Project Procedure Manual and as applicable) – single PDF file for each item Contact the Design Manager for directions on which e-Builder documents file folder to place each item. Upload file(s) in e-Builder under the “Attached Documents” tab.

22	<input type="checkbox"/> Explanation for Missing Items and Detailed Explanation for Review Comments from previous Design Submission when not fully complied with in this Submission – Add text to comment box in e-Builder
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Note: For more detailed descriptions of the items listed above, see Chapter 5 of the BOPC Project Procedure Manual.

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION CHECKLIST
(e-Builder)

1	<input type="checkbox"/>	Interim Construction Documents Submission Probable Construction Cost Summaries (Exhibit B7) <input type="checkbox"/> Base Bid 1 – single PDF file <input type="checkbox"/> Base Bid 2 – single PDF file <input type="checkbox"/> Base Bid 3 – single PDF file
2	<input type="checkbox"/>	Interim Construction Documents Project Information Sheets (Exhibit B8) – single PDF file
3	<input type="checkbox"/>	All Interim Construction Documents Drawings w/ Cover Sheet – single PDF file
4	<input type="checkbox"/>	Project Manual (include all required specification sections) – single PDF file
5	<input type="checkbox"/>	List of Required Regulatory Approvals/Permits – Status Report (Exhibit F3) – single PDF file
6	<input type="checkbox"/>	Copies of All Applications for Approvals/Permits Submitted During this Design Period – single PDF file
7	<input type="checkbox"/>	Copies of All Approvals/Permits Received During this Design Period – single PDF file
8	<input type="checkbox"/>	Meeting Minutes from the Professional’s Meeting w/ Bureau of Construction Regional Director – single PDF file
9	<input type="checkbox"/>	Updated Project Schedule – single PDF file
10	<input type="checkbox"/>	Report on Status of LEED Efforts (if applicable) – single PDF file
11	<input type="checkbox"/>	Report on Status of Current and Anticipated Additional Services – single PDF file
12	<input type="checkbox"/>	Additional Items (identified in Chapter 6 of the BOPC Project Procedure Manual and as applicable) – single PDF file for each item Contact the Design Manager for directions on which e-Builder documents file folder to place each item. Upload file(s) in e-Builder under the “Attached Documents” tab.
13	<input type="checkbox"/>	Explanation for Missing Items and Detailed Explanation for Review Comments from previous Design Submission when not fully complied with in this Submission – Add text to comment box in e-Builder

Note: For more detailed descriptions of the items listed above, see Chapter 6 of the BOPC Project Procedure Manual.

CONSTRUCTION DOCUMENTS SUBMISSION CHECKLIST**(e-Builder)**

1	<input type="checkbox"/> Code Review and Analysis – single PDF file
2	<input type="checkbox"/> Construction Documents Submission Probable Construction Cost Summaries (Exhibit B9) <input type="checkbox"/> Base Bid 1 – single PDF file <input type="checkbox"/> Base Bid 2 – single PDF file <input type="checkbox"/> Base Bid 3 – single PDF file
3	<input type="checkbox"/> Construction Documents Project Information Sheets (Exhibit B10) – single PDF file
4	<input type="checkbox"/> Project Manual (include cover page, table of contents, Division 1 and all technical specification sections) – single PDF file
5	<input type="checkbox"/> All Construction Documents Drawings w/ Cover Sheet – single PDF file
6	<input type="checkbox"/> List of Utility Approvals – Status Report Exhibit F4 – Identify any unresolved items - single PDF file.
7	<input type="checkbox"/> List of Required Regulatory Approvals/Permits – Status Report (Exhibit F3) – single PDF file
8	<input type="checkbox"/> Copies of All Applications for Approvals/Permits Submitted During this Design Period – single PDF file
9	<input type="checkbox"/> Copies of All Approvals/Permits Received During this Design Period – single PDF file
10	<input type="checkbox"/> Meeting Minutes from the Professional’s Meeting w/ Bureau of Construction Regional Director (if not previously submitted) – single PDF file
11	<input type="checkbox"/> Geotechnical Report (if changed or revised since previous submission) – single PDF file
12	<input type="checkbox"/> Other Reports (if changed or revised since previous submission) – single PDF file for each item <input type="checkbox"/> Contact the Design Manager for directions on which e-Builder documents file folder to place each item. Upload file(s) in e-Builder under the “Attached Documents” tab.
13	<input type="checkbox"/> Letter from Professional Confirming Compliance with Geotechnical Consultant’s Recommendations – single PDF file
14	Final Engineering Calculations – single PDF for each Discipline <input type="checkbox"/> Sanitary <input type="checkbox"/> Structural <input type="checkbox"/> HVAC <input type="checkbox"/> Water <input type="checkbox"/> Plumbing <input type="checkbox"/> Fire Protection <input type="checkbox"/> Electrical <input type="checkbox"/> Other
15	<input type="checkbox"/> Proposed Construction Schedule Bar Chart w/ Recommended Number of Calendar Days for Construction and Number of Calendar Days of Temporary Heat – single PDF file
16	<input type="checkbox"/> Proposed RFP for Quality Assurance Services Construction Geotechnical – single PDF file
17	<input type="checkbox"/> Proposed RFP for Quality Assurance Services Construction Hazardous Materials Air Quality Monitoring – single PDF file
18	<input type="checkbox"/> Proposed RFP for Quality Assurance Services Special Inspections and Testing – single PDF file
19	<input type="checkbox"/> Proposed RFPs for Quality Assurance Services Construction Monitoring – single PDF file
20	<input type="checkbox"/> Professional Color Rendering as a digital Picture File (if applicable) – single PDF file
21	<input type="checkbox"/> Report on Status of LEED Efforts (if applicable) – single PDF file

22	<input type="checkbox"/> Land Title/Lease Confirmation Drawing – single PDF file
23	<input type="checkbox"/> Submittals Register (listing of all submittals identified in the Project Manual including but not limited to shop drawings, material data, samples, and product data) – single PDF file. Coordinate the format with the submittals register page in e-Builder
24	<input type="checkbox"/> Copies of all existing drawings/documents obtained from the Client Agency, the Institution, and/or DGS that have been scanned by the Professional – single PDF file for each item
25	<input type="checkbox"/> Additional Items (called for in Chapter 7 of the BOPC Project Procedure Manual and as applicable) – single PDF file for each item Contact the Design Manager for directions on which e-Builder documents file folder to place each item. Upload file(s) in e-Builder under the “Attached Documents” tab.
26	<input type="checkbox"/> Explanation for Missing Items and Detailed Explanation for Review Comments from previous Design Submission when not fully complied with in this Submission – Add text to comment box in e-Builder

Note: For more detailed descriptions of the items listed above, see Chapter 7 of the BOPC Project Procedure Manual.

RELEASE FOR BIDDING CHECKLIST

Project Number: _____ Phase: _____ CD Approval Date: _____

Project Title: _____

Location: _____ Client Agency: _____

Professional Firm: _____

Instructions to Professional: The Project is being prepared for bidding, the Professional shall confirm each of the following items. Attach comments if necessary to explain the status of any item. This signed form is to be submitted to the BOPC Design Manager prior to the Project being released for bid.

NO.	YES	NO	N/A	ITEM
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All regulatory permits, approvals and variances that might be relevant have been identified, investigated and determined as applicable, or not applicable.
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> Where not applicable, written confirmation on proper letterhead has been obtained from the entity having jurisdiction that such permits/approvals are not applicable.
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> Where applicable, copies of all permits/approvals have been obtained and noted on the cover sheet of the drawings (upper right hand corner).
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All utility agreements, easements, or licenses that might be relevant have been identified, and investigated. If determined as applicable, such agreements have been executed. List:
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Professional has reviewed the finalized project documentation with DGS' Bureau of Construction (BOC) representative, including the project milestone schedule, construction duration, temporary utilities (heating, electric, water, telephone, etc.), job trailers, lay-down areas and other important construction aspects of the project: List reviewing BOC representative(s):
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All specified products that are proprietary in nature or by specification have received DGS' written approval. List:
7	<input type="checkbox"/>	<input type="checkbox"/>		Are there any revenue generating spaces such as concessions or retail? <i>(Design Manager: if the answer is yes, check the Determination of Tax Exempt form filled out by the Client Agency at the start of the Project, Management Directive 105.5. Refer to the PPM for additional information)</i>
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PHMC and all historical or preservationist commissions that have approval or advisory jurisdiction have been contacted and comments incorporated.
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Required Municipal Agreements and Developer Agreements have been executed and Land Development Plans recorded. List:
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Where applicable and appropriate, subsurface investigations have been completed and are incorporated into the project and reflected in the CD Documents.
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Where applicable and appropriate, environmental and hazardous material testing and investigations have been completed and are incorporated into the project and reflected in the CD Documents.
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A letter from the University on their letterhead, stating/confirming that "the contract limit area is not affected by any lease agreements, and will not be, for the length of the Project". <i>[This item is required only on University projects, and must be attached to the Land Title Confirmation request.]</i>

I hereby confirm that to the best of my knowledge, the above statements are true [, as noted]:

Design Professional (printed)

Design Professional (signature)

Date

BID PREP CHECKLIST

Project Number: _____ Phase: _____ Scheduled Bid Ad Date: _____

Project Title: _____

Location: _____ Client Agency: _____

Professional Firm: _____

Design Manager to verify the following items have been obtained, defined, or resolved as applicable. This form is to be uploaded to e-Builder File 35 CD/02 Correspondence prior to the Project being released for bid.

NO.	YES	NO	N/A	ITEM
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Construction Document Approved by DGS and Client Agency
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Coal Non-Use Justification
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PHMC final response
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proprietary approvals
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	License & Utility Agreements, Easements
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Zoning, Land Development, DEP, PNDI, All Other Permits And Approvals
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Health Department Approval
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Labor & Industry Approval/Building Permit
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Land Title Confirmation
10				Following Documents In Bid Documents Folder:
a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Project Specifications
b	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Project Drawings
c	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bid Withdrawl Form
d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bid Protest Form
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ITQ Or Best Value Project (verify determination)
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Contractor Pre-Qualification Required (Certain PHMC Projects only. If yes, requires pre-approval by the Director.)
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unit Prices
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Federal Funds
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Third Party Funding Source Requirement
16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Contracts Included, Lead Contractor
17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Number of Base Bids (verify cost estimates match Base Bid Descriptions)
18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Construction Duration (calendar days)(verify Professional's schedule and BOC)
19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Construction Amount Total (current)
20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Estimated Contract Totals (for each contract and base bid, escalated to projected construction mid-point)
21	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clearance to start bidding before all permits are received. (Attach separate signed Pre-Clearance Request Form.) List:
22	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Advanced Clearance Required (Provide separate signed Advanced Clearance Form to have the Office of Budget release the funds early for the project.)

PROJECT MANUAL

PROJECT NO. DGS ____ - ____ PHASE _

- Contract No. DGS ____ - ____ Phase 1.1 – General Construction**
- Contract No. DGS ____ - ____ Phase 1.2 – HVAC Construction**
- Contract No. DGS ____ - ____ Phase 1.3 – Plumbing Construction**
- Contract No. DGS ____ - ____ Phase 1.4 – Electrical Construction**

For

Project Title
Project Institution
(City, Borough, Township) , _____ **County, PA**

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

Xxxxxx X. Xxxxxxx, Governor
Xxxxxx X. Xxxxxxxx, Secretary



Date: (Same as Drawings)

Professional's Firm Name
Professional's Address

Phone: (____) ____ - ____ Fax: (____) ____ - ____

TABLE OF CONTENTS

[Professional to edit as required to suit the Project.]

<u>SECTION</u>	<u>TITLE</u>
	Project Manual Cover Page
	Table of Contents
<u>DIVISION 01</u>	<u>GENERAL REQUIREMENTS</u>
Section 010100	Summary of Work
Section 010250	Unit Prices of Lump Sum Contracts <i>[if applicable]</i>
Section 010300	Base Bid Descriptions
Section 010400	Coordination and Control
Section 010500	Coordination Drawings <i>[if applicable]</i>
Section 013100	Sequence of Construction & Milestones
Section 014000	Quality Control Testing Services
Section 014010	Quality Assurance Testing and Inspection Services
Section 015000	Temporary Utilities
Section 016100	Dept. of Corrections - Supplemental Provisions <i>[if applicable]</i>
Section 016150	Dept. of Human Services - Supplemental Provisions <i>[if applicable]</i>
Section 016200	Historical and Museum Commission Projects – Supplemental Provisions <i>[if applicable]</i>
Section 016250	Pennsylvania State Police - Supplemental Provisions <i>[if applicable]</i>
Section 016300	Flood Protection Projects - Supplemental Provisions <i>[if applicable]</i>
Section 016350	Dept. of Military & Veterans Affairs (BVH) – Supplemental Provisions <i>[if applicable]</i>
Section 016400	Capitol Complex Security Program and Contractor Requirements <i>[if applicable]</i>
<u>DIVISION 02</u>	<u>EXISTING CONDITIONS</u>
Section 024116	Structure Demolition
<u>DIVISION 03</u>	<u>CONCRETE</u>
Section 033000	Cast-In-Place Concrete
<u>DIVISION 04</u>	<u>MASONRY</u>
Section 042000	Unit Masonry
<u>DIVISION 05</u>	<u>METALS</u>
Section 051200	Structural Steel Framing
<u>DIVISION 06</u>	<u>WOOD, PLASTICS, AND COMPOSITES</u>
Section 061000	Rough Carpentry
<u>DIVISION 07</u>	<u>THERMAL AND MOISTURE PROTECTION</u>
Section 072100	Thermal Insulation
<u>DIVISION 08</u>	<u>OPENINGS</u>
Section 081113	Hollow Metal Doors and Frames
<u>DIVISION 09</u>	<u>FINISHES</u>
Section 092900	Gypsum Board
<u>DIVISION 10</u>	<u>SPECIALTIES</u>
Section 101200	Display Cases
<u>DIVISION 11</u>	<u>EQUIPMENT</u>
Section 111200	Parking Control Equipment
<u>DIVISION 12</u>	<u>FURNISHINGS</u>

Section 122200	Curtains and Drapes
<u>DIVISION 13</u>	<u>SPECIAL CONSTRUCTION</u>
Section 133419	Metal Building Systems
<u>DIVISION 14</u>	<u>CONVEYING EQUIPMENT</u>
Section 142400	Hydraulic Elevators
<u>DIVISION 21</u>	<u>FIRE SUPPRESSION</u>
Section 210100	Common Work Results for Fire Suppression
<u>DIVISION 22</u>	<u>PLUMBING</u>
Section 220100	Common Work Results for Plumbing
<u>DIVISION 23</u>	<u>HEATING, VENTILATING, AND AIR CONDITIONING</u>
Section 230100	Common Work Results for HVAC
<u>DIVISION 26</u>	<u>ELECTRICAL</u>
Section 260100	Common Work Results for Electrical
<u>DIVISION 27</u>	<u>COMMUNICATIONS</u>
Section 260100	Common Work Results for Communications
<u>DIVISION 28</u>	<u>ELECTRONIC SAFETY AND SECURITY</u>
Section 280100	Common Work Results for Electronic Safety and Security
<u>DIVISION 31</u>	<u>EARTHWORK</u>
Section 311000	Site Clearing
<u>DIVISION 32</u>	<u>EXTERIOR IMPROVEMENTS</u>
Section 321216	Asphalt Paving
<u>DIVISION 33</u>	<u>UTILITIES</u>
Section 330500	Common Work Results for Utilities
<u>APPENDIX</u>	<u>PERMITS [Include itemized list]</u>

COVER SHEET LAYOUT

<p>1 3/4"</p>	<p>34 1/2"</p>	<p>COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF GENERAL SERVICES</p> <p>HARRISBURG, PENNSYLVANIA</p> <p>XXXXXXXXXXXXXXXXXXXX, GOVERNOR XXXXXXXX XXXXXXXX, SECRETARY</p> <p>PROJECT NO. D.G.S. XXX-XX PHASE X PROJECT NAME [E1 (30 x 42) SHEET] PROJECT LOCATION <city/township>, <county> COUNTY, PENNSYLVANIA</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>PROFESSIONAL / ARCHITECT RIVERSIDE ARCHITECTURAL PARTNERSHIP 1234 MAIN STREET ERIE, PA PHONE (555) 555-5555</p> </div> <div style="width: 30%;"> <p>STRUCTURAL ENGINEERING CONSULTANT GREENSTICK ENGINEERS 7890 NORTH SECOND AVENUE PITTSBURGH, PA</p> </div> <div style="width: 30%;"> <p>MECHANICAL ENGINEERING CONSULTANT BUTTONTOWN ENGINEERS 7854 EAST 42 STREET JOHNSTON, PA</p> </div> <div style="width: 30%;"> <p>ELECTRICAL ENGINEERING CONSULTANT SPARKS ENGINEERS 1542 OHIO LANE ERIE, PA</p> </div> </div>	<p>3/4"</p>																																																																																																										
<p>CODE APPROVALS</p> <p style="text-align: right;">5" 3/4"</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;"> <p>List Approval Numbers and dates for each applicable Agency</p> </div>		<p>PROJECT LOCATION MAP</p> 	<p>VICINITY MAP</p> 	<p>CAMPUS / KEY PLAN</p>																																																																																																									
<p>SHEET INDEX</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">DRAWINGS COMMON TO ALL CONTRACTS</td> <td style="width: 20%;">HVC CONSTRUCTION CONTRACT NO. DGS 888-BB PHASE 1,2</td> <td style="width: 20%;">PLUMBING CONSTRUCTION CONTRACT NO. DGS 888-BB PHASE 1,3</td> <td style="width: 20%;">ELECTRICAL CONSTRUCTION CONTRACT NO. DGS 888-BB PHASE 1,4</td> <td style="width: 20%;"></td> </tr> <tr> <td>CS-1 COVER SHEET</td> <td>HVC DRAWINGS</td> <td>PLUMBING DRAWINGS</td> <td>ELECTRICAL DRAWINGS</td> <td></td> </tr> <tr> <td>G-1 OVERALL SITE PLAN</td> <td>H-1</td> <td>P-1</td> <td>E-1</td> <td></td> </tr> <tr> <td>G-2 GENERAL INFORMATION (ODD REVIEW, EXPRESS PLANS, ETC.)</td> <td>H-2</td> <td>P-2</td> <td>E-2</td> <td></td> </tr> <tr> <td></td> <td>H-3</td> <td>P-3</td> <td>E-3</td> <td></td> </tr> <tr> <td></td> <td>H-4</td> <td>P-4</td> <td>E-4</td> <td></td> </tr> <tr> <td>GENERAL CONSTRUCTION CONTRACT NO. DGS 888-BB PHASE 1,1</td> <td></td> <td>FIRE PROTECTION DRAWINGS</td> <td>ALARM AND DETECTION DRAWINGS</td> <td></td> </tr> <tr> <td>CIVIL DRAWINGS</td> <td></td> <td>FP-1</td> <td>AD-1</td> <td></td> </tr> <tr> <td>C-1</td> <td></td> <td>FP-2</td> <td>AD-2</td> <td></td> </tr> <tr> <td>C-2</td> <td></td> <td>FP-3</td> <td>AD-3</td> <td></td> </tr> <tr> <td>C-3</td> <td></td> <td>FP-4</td> <td>AD-4</td> <td></td> </tr> <tr> <td>ARCHITECTURAL DRAWINGS</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A-1</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A-2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A-3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>A-4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>STRUCTURAL DRAWINGS</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>S-1</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>S-2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>S-3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>S-4</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>					DRAWINGS COMMON TO ALL CONTRACTS	HVC CONSTRUCTION CONTRACT NO. DGS 888-BB PHASE 1,2	PLUMBING CONSTRUCTION CONTRACT NO. DGS 888-BB PHASE 1,3	ELECTRICAL CONSTRUCTION CONTRACT NO. DGS 888-BB PHASE 1,4		CS-1 COVER SHEET	HVC DRAWINGS	PLUMBING DRAWINGS	ELECTRICAL DRAWINGS		G-1 OVERALL SITE PLAN	H-1	P-1	E-1		G-2 GENERAL INFORMATION (ODD REVIEW, EXPRESS PLANS, ETC.)	H-2	P-2	E-2			H-3	P-3	E-3			H-4	P-4	E-4		GENERAL CONSTRUCTION CONTRACT NO. DGS 888-BB PHASE 1,1		FIRE PROTECTION DRAWINGS	ALARM AND DETECTION DRAWINGS		CIVIL DRAWINGS		FP-1	AD-1		C-1		FP-2	AD-2		C-2		FP-3	AD-3		C-3		FP-4	AD-4		ARCHITECTURAL DRAWINGS					A-1					A-2					A-3					A-4					STRUCTURAL DRAWINGS					S-1					S-2					S-3					S-4				
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	H-4	P-4	E-4																																																																																																										
GENERAL CONSTRUCTION CONTRACT NO. DGS 888-BB PHASE 1,1		FIRE PROTECTION DRAWINGS	ALARM AND DETECTION DRAWINGS																																																																																																										
CIVIL DRAWINGS		FP-1	AD-1																																																																																																										
C-1		FP-2	AD-2																																																																																																										
C-2		FP-3	AD-3																																																																																																										
C-3		FP-4	AD-4																																																																																																										
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<p>COVER SHEET INSTRUCTIONS</p> <p>Cover sheet layout may be varied as determined by project requirements; however, all pertinent information must be included with the adjustments, as applicable to particular projects.</p> <p>Do not place lists of abbreviations, legends or symbols on cover sheet.</p> <p>Include diagrammatic Project Location Map, Vicinity Map, and Institutional Campus Plan.</p>																																																																																																													
<p>PROJECT TITLE</p> <p>PROJECT NO. XXX-XX PHASE X</p> <p>CONTRACT NO. XXX-XX PHASE X</p>		<p>COVER SHEET</p> <p>SHEET NO. CS-1</p>																																																																																																											

COVER SHEET TITLE BLOCK

[For use on the Cover Sheet only. Edit with the correct information for the Project Number, Project Title and Location, Professional's Name and Address, Design Manager's Name, Date, etc.]

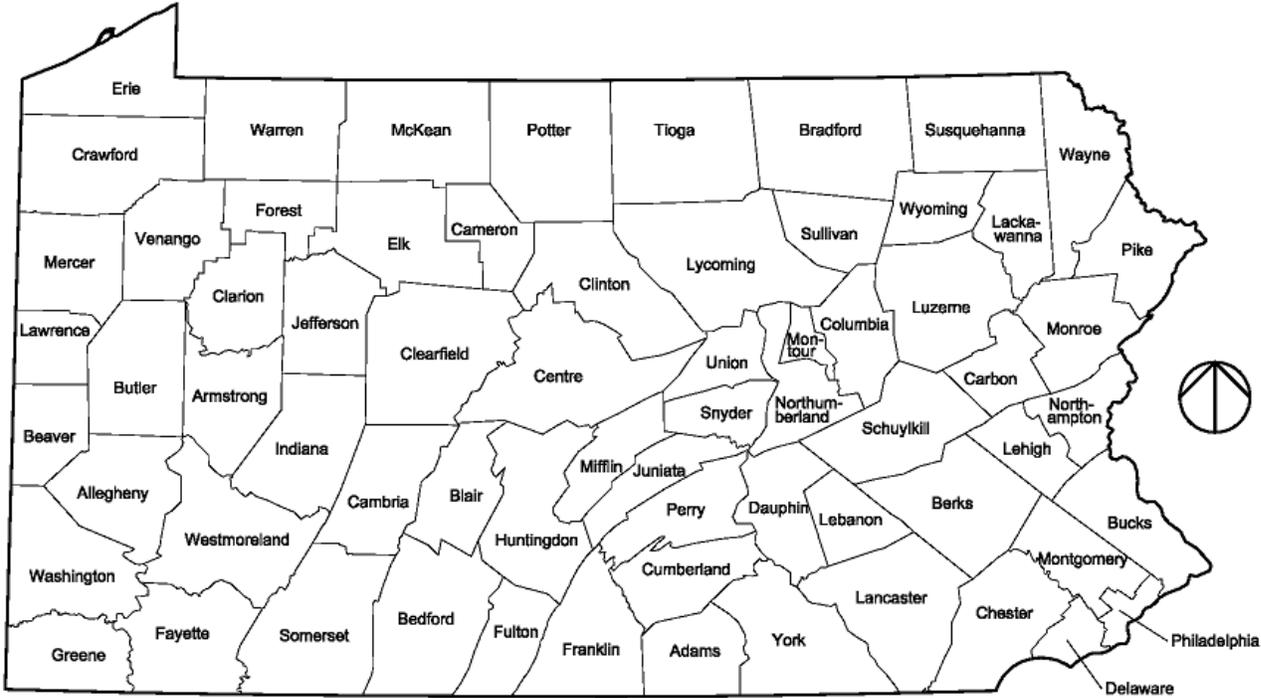
The form is a vertical rectangle with a total width of 5 inches and a total height of 8 inches. It is divided into several horizontal sections. From top to bottom:

- Section 1 (Height: 1 1/2"): DRAWINGS LISTED IN INDEX:** A section for listing drawings.
- Section 2 (Height: 2 3/4"): APPROVED _____ DATE _____** A section for approval and date, followed by the text: DESIGN MANAGER, BUREAU OF PRE-CONSTRUCTION, DEPARTMENT OF GENERAL SERVICES. Below this is a large circular area labeled "SEAL" and a line for "PROFESSIONAL'S SIGNATURE".
- Section 3 (Height: 1"): JOHN E. SMITH & ASSOCIATES ARCHITECTS & ENGINEERS** Professional details including address: 208 MAIN STREET, SUITE 4, HARRISBURG, PENNSYLVANIA.
- Section 4 (Height: 1"): COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF GENERAL SERVICES** Agency name and address: HARRISBURG, PENNSYLVANIA.
- Section 5 (Height: 1/2"): D.G.S. PROJECT No. A XXX-XX PHASE X** Project identification.
- Section 6 (Height: 1 1/8"): PROJECT TITLE** Project name and location: DEPARTMENT of <agency name>, <city/township>, <county> COUNTY, PA.
- Section 7 (Height: 5/8"): COVER SHEET** Title of the sheet.
- Section 8 (Height: 1/2"): DRAWN BY F LASTNAME, CHECKED BY F LASTNAME, DATE MMM YYYY, SCALE AS NOTED, SHEET No. CS-1** Drawing and sheet information.

PROJECT LOCATION MAP

[Use this image in the "Project Location Map" Box in the Cover Sheet Title Block.

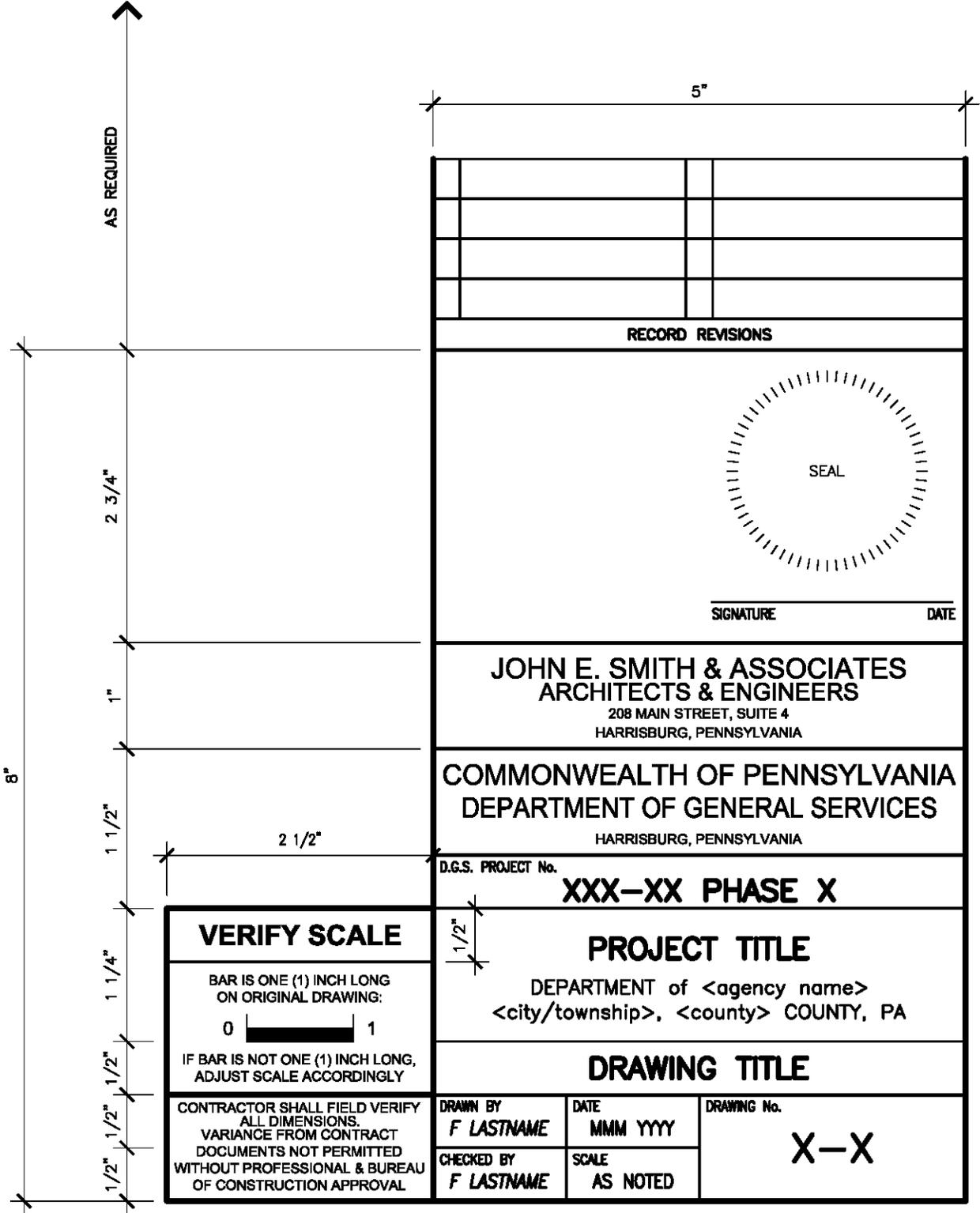
Shade or otherwise indicate the County in which the Project is located.]



NO SCALE

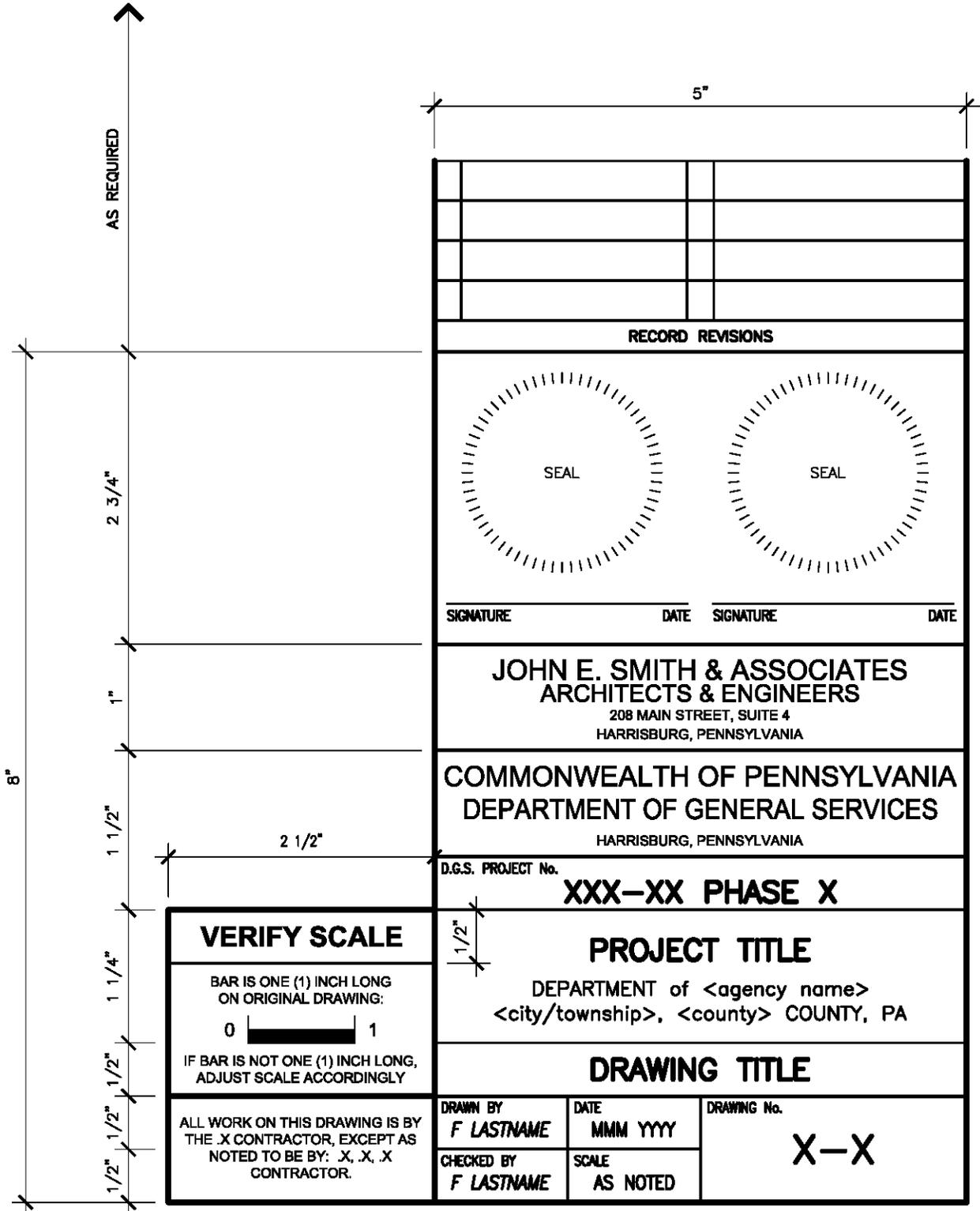
STANDARD SHEET TITLE BLOCK

[For use on all Drawings other than the Cover Sheet. Edit with the correct information for the Project Number, Project Title and Location, Professional's Name and Address, Date, etc.]



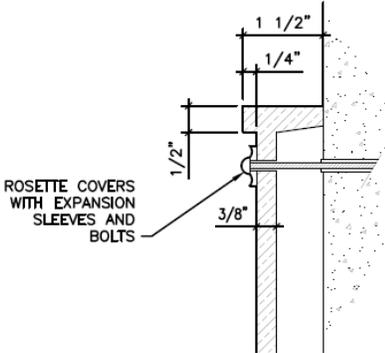
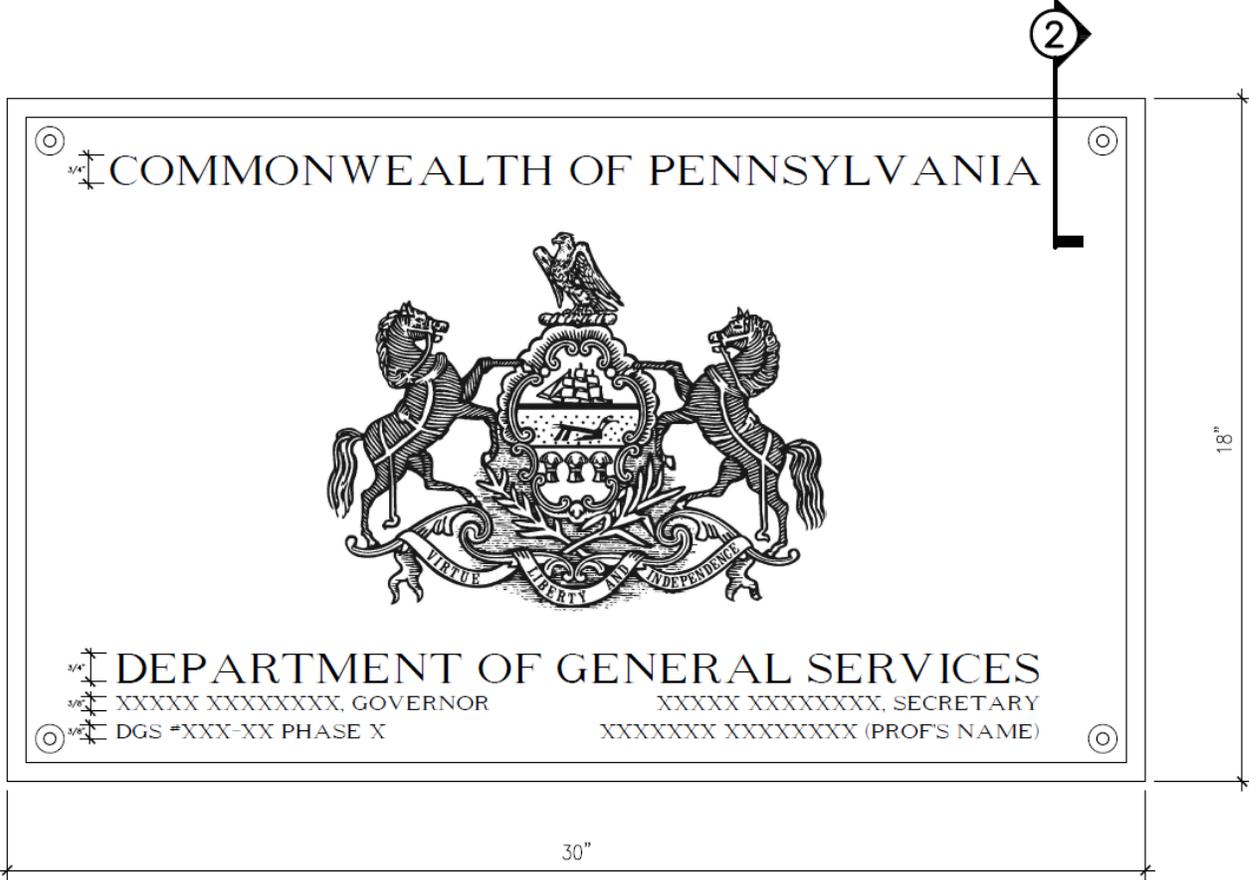
STANDARD SHEET TITLE BLOCK - MULTI-DISCIPLINE DRAWING

[For Multi-Discipline Drawings showing work of more than one Prime Contractor, indicate responsibilities by means of this Title Block. Refer to Chapter 8 of the Project Procedure Manual.]



STANDARD PLAQUE DETAIL

*[Every project must have a plaque unless waived by the Department;
Cast aluminum, "EuroRoman" letter style, all names and dates to be verified]*



2 MOUNTING DETAIL
SCALE: 6" = 1'-0"

- NOTES:**
1. INCLUDE A STANDARD DGS CAST ALUMINUM BUILDING PLAQUE FOR ALL NEW AND RENOVATION PROJECTS.
 2. INCLUDE THIS PLAQUE DETAIL ON THE DRAWINGS AND PLAQUE SPECIFICATION IN THE PROJECT MANUAL.
 3. PLAQUE IS TO BE CAST ALUMINUM WITH AN ANODIZED FINISH.
 4. CONSULT WITH THE USING AGENCY FOR THE EXACT LOCATION OF THE PLAQUE AND INDICATE THAT LOCATION ON THE DRAWINGS.
 5. COORDINATE THE EXACT COLOR OF THE FINISH WITH OTHER METAL FINISHES ON THE PROJECT AND MAKE RECOMMENDATION TO THE USING AGENCY FOR THEIR APPROVAL.
 6. VERIFY ALL NAMES AND DATE WITH THE USING AGENCY. ADJUST THE HEIGHT OF THE PLAQUE IF ADDITIONAL NAMES OR INFORMATION IS REQUIRED BY THE USING AGENCY.
 7. MAKE A PRELIMINARY SELECTION OF THE BACKGROUND TEXTURE AND SUBMIT TO THE USING AGENCY FOR APPROVAL. BACKGROUNDS TO SELECT FROM INCLUDE SMOOTH, LEATHERETTE, MATTE, AND STIPPLE.
 8. SUBMIT A PHYSICAL SAMPLE OF THE PLAQUE MATERIAL AND FINISHES FOR FINAL APPROVAL BY THE USING AGENCY.

SUBDIVISION/LAND DEVELOPMENT PLAN SIGNATURE BLOCK

CERTIFICATION OF OWNERSHIP, AND
ACKNOWLEDGEMENT OF PLAN

COMMONWEALTH OF PENNSYLVANIA :
: S.S.
COUNTY OF DAUPHIN :

On this, the _____ day of _____ 20__, before the undersigned officer, personally appeared * _____, ** _____ of the Department of General Services of the Commonwealth of Pennsylvania, who, being duly sworn according to law, deposes and confirms that the Commonwealth of Pennsylvania, acting by and through the Department of General Services, is the owner of the property shown on this plan, that he is authorized to execute this plan on behalf of the Department of General Services, that this plan is the act and deed of the Department of General Services, and that the Department of General Services desires this plan to be recorded.

Name:
Title:

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

Notary Public

My Commission Expires _____.

* Individual's Name
** Individual's Title

MONTHLY PROGRESS REPORT

Project Number: _____ Phase: _____ Reporting Period: _____

Project Title: _____

Location: _____ Client Agency: _____

Professional Firm: _____

- PROGRAMMING SCHEMATIC DESIGN DESIGN DEVELOPMENT
- INTERIM CONSTRUCTION DOCUMENTS CONSTRUCTION DOCUMENTS

DISCIPLINE AND PERCENTAGE OF COMPLETION

	<u>Previous Reporting Period</u>	<u>This Reporting Period</u>
<input type="radio"/> Site Visit / Programming:	_____ % complete	_____ % complete
<input type="radio"/> Civil:	_____ % complete	_____ % complete
<input type="radio"/> Architectural:	_____ % complete	_____ % complete
<input type="radio"/> Structural:	_____ % complete	_____ % complete
<input type="radio"/> Heating, Ventilating, Air Conditioning:	_____ % complete	_____ % complete
<input type="radio"/> Plumbing:	_____ % complete	_____ % complete
<input type="radio"/> Fire Protection:	_____ % complete	_____ % complete
<input type="radio"/> Electrical:	_____ % complete	_____ % complete
<input type="radio"/> Specifications:	_____ % complete	_____ % complete
<input type="radio"/> Probable Construction Cost:	_____ % complete	_____ % complete

BRIEF DESCRIPTION OF PROJECT DEVELOPMENT (During This Reporting Period)

- Meetings Attended:

- Status of Surveys & Investigations:

- Work Related to Approvals:

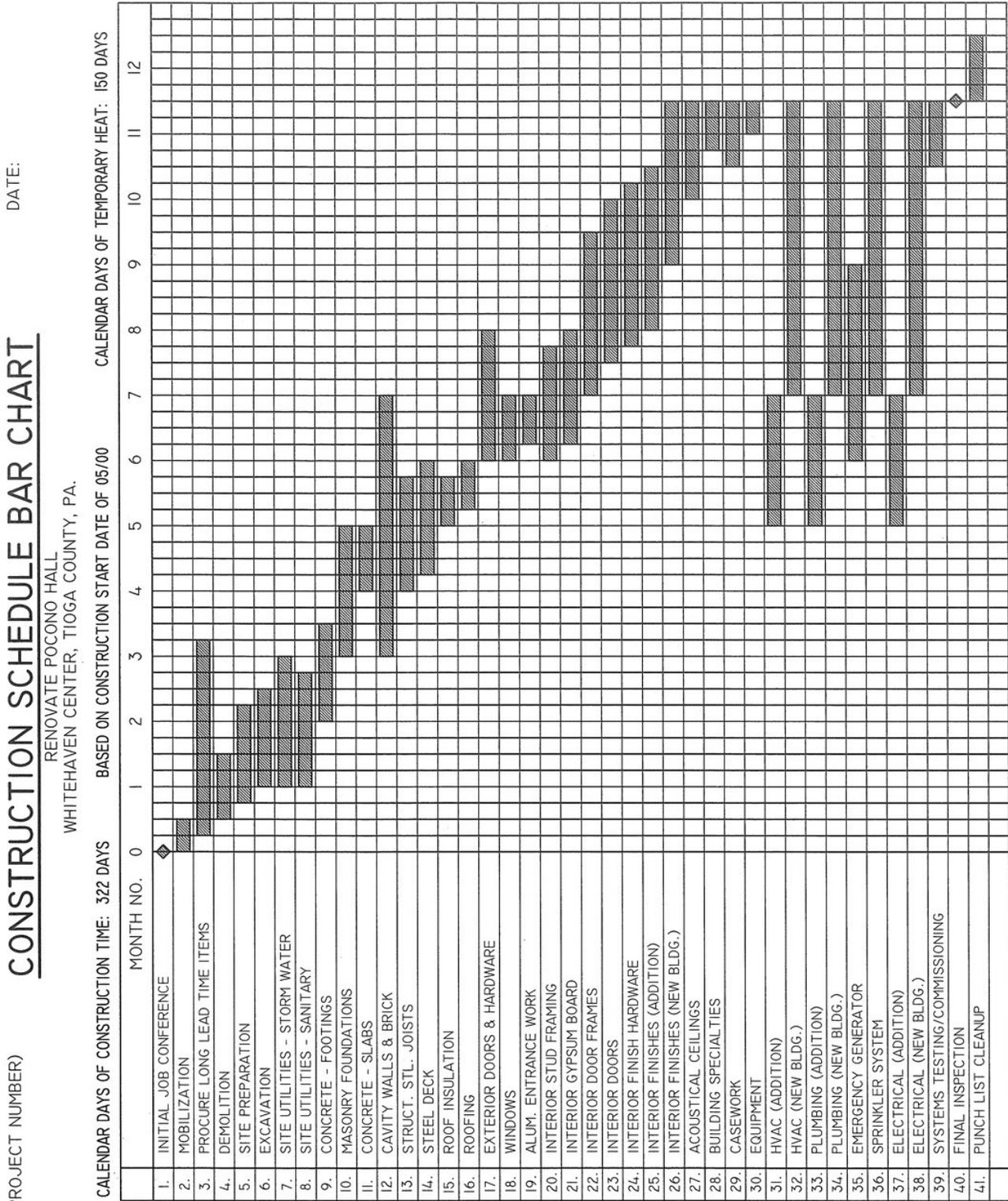
- Status of Site Utilities (Including Utility Company Letters, Easements & Agreements):

- LEED Efforts (if applicable):

Note: This form is to be submitted with each monthly invoice for the Professional's Basic Services. Attach additional sheets, as required, for additional information related to services performed to date.

CONSTRUCTION SCHEDULE BAR CHART

[Note: The schedule shown is intended only as an example. The Professional shall edit the indicated milestones to appropriately represent the Work of the Project.]



LIST OF REGULATORY APPROVALS / PERMITS – STATUS REPORT

Project Number: _____ Phase: 1 Reporting Period: _____

Project Title: _____

Location: _____ Client Agency: _____

Professional Firm: _____

- PROGRAMMING SCHEMATIC DESIGN DESIGN DEVELOPMENT
 INTERIM CONSTRUCTION DOCUMENTS CONSTRUCTION DOCUMENTS

NO.	ITEM	GRANTING AUTHORITY	APPLICATION DATE (ANTICIPATED or ACTUAL)	APPROVAL DATE (ANTICIPATED or ACTUAL)
1	Local Approvals (as applicable)	Municipality		
2	Zoning Permit	Municipality		
3	Storm Water Management Approval	Municipality/ County		
4	Soil Erosion and Sedimentation Control Permit	Municipality/ County		
5	Subdivision/Land Development Plan Approval	Municipality/ County		
6	PA UCC Approval (including Building Permit)	L & I		
7	PA Natural Diversity Index (PNDI)	DCNR/PGC/ PFBC/USF&WS		
8	Highway Occupancy Permit	PennDOT		
9	Sanitary Sewer Planning Module	DEP		
10	Underground Tanks Approval	L & I / DEP		
11	Flood Plain Approval	DEP / FEMA		
12	Wetlands Approval	DEP		
13	Archaeological Approval	PHMC		
14	Historical Building Approval	PHMC		
15	NPDES Approval	DEP / CCCD		
16				
17				

Instructions to Professional:

- Add additional approvals/permits, as applicable, for a complete list of all required for the Project.
- This form is to be submitted with each submission.
- Upload applications and approvals/permits as separate documents in e-Builder. Refer to each submission’s checklist in Exhibits C1 through C5.

LIST OF UTILITY APPROVALS – STATUS REPORT

Project Number: _____ Phase: _____ Reporting Period: _____

Project Title: _____

Location: _____ Client Agency: _____

Professional Firm: _____

- PROGRAMMING SCHEMATIC DESIGN DESIGN DEVELOPMENT
 INTERIM CONSTRUCTION DOCUMENTS CONSTRUCTION DOCUMENTS

NO.	UTILITY TYPE	UTILITY COMPANY	CONTACT or APPLICATION DATE (* ANTICIPATED or ACTUAL)	CONFIRMATION DATE (* ANTICIPATED or ACTUAL)	AGREEMENT REQUIRED (FOR TYPE, SEE BELOW)
1	Electric				
2	Water				
3	Gas				
4	Telephone				
5	Cable TV				
6	Sanitary Sewer				
7	Storm Sewer				
8	Communications				
9					
10					

* A date is required for each utility.

An agreement is necessary for a Project when one of the following occurs:

- A License Agreement is required when there is zero cost to the Project, but the Utility Company needs a right-of-way on Commonwealth property which allows the Utility Company to access the property to construct, install, repair, maintain, and/or replace their line.
- A Utility Agreement is required when there is a cost to the Project and Project funds are to be used to pay the Utility Company for work they perform for the Project, or depending on the circumstances, when Project funds are to pay some type of fee to the Utility Company. The Utility Agreement includes a right-of-way on Commonwealth Property.
- A Service Agreement does not require anything of the Professional or DGS Legal, but is an agreement between the Client Agency and the Utility Company for the payment of monthly service bills. The Client Agency executes the Service Agreement with the Utility Company directly.

Instructions to Professional:

- **Add additional Utilities, as applicable, for a complete list of all required for the Project.**
- **This form is to be submitted with each submission.**
- **Upload all service request letters, applications, will serve letters, approval letters, and draft license/utility agreements as separate documents in e-Builder. Refer to each submission’s checklist in Exhibits C1 through C5.**

PROPRIETARY REQUEST PROCEDURES

- A. Requests, review, approval or disapproval of proprietary products/systems will occur through an e-Builder process.
- B. The Client Agency initiates the process in e-Builder requesting a proprietary item/system to be specified in the Contract documents, along with justification for making the request. The Client Agency representative initiates the process as follows:
1. Add a "Subject" name. This name is used as an identifier in the listing of all processes for the project. Suggested subject name is the name of the product/system like "Door Hardware" or "ATC System".
 2. From a drop down menu select the product/system type. If the type is not listed in the menu, select "Other" and add the type in the description of the product/system.
 3. Add the manufacturer's name and description of the product/system in the input box provided.
 4. Add the reason(s) for the request in an input box explaining how the product/system best serves the Commonwealth and giving compelling reasons why only this particular proprietary product must be used.
 5. Attach supporting documents as needed to the request via the attach document function of the e-Builder process. The process will automatically store the attached files in the project's folder structure under 10 Design Administration/04 Approvals & Permits/05 Proprietary.
 6. Once all information is included, take the "Submit" action. The request will then be automatically forwarded to the Professional by e-Builder.
- C. The Professional, reviews the request and supporting information and takes one of two actions:
1. **Revise:** If the Professional has questions, comments or requires additional information, the Professional adds its comments to the request and takes the "Revise" action. This action sends the request back to the Client Agency to address the comments. Once addressed the Client Agency takes the "Submit" action again sending it back to the Professional. This "Revise" and "Submit" cycle can be repeated until all questions and comments are satisfied.
 2. **Reviewed:** If the Professional agrees with the request and all supporting reasons and information, the Professional adds the following information into the process:
 - a. Estimated cost of the proprietary product/system
 - b. Estimated cost of non-proprietary product/system that can provide the same function.
 - c. Base Bid 1 probable construction cost
 - d. Calculate and add the cost of the proprietary product/system as a percentage of the Base Bid 1 probable construction cost.

Once all information is inserted, the Professional takes the "Reviewed" action which automatically sends the request to the Design Manager.
- D. The Bureau of Pre-Construction Design Manager reviews the request and, if he/she has questions, comments or requires additional information, the Design Manager takes the "Revise" action which forwards the comments back to the Professional to address. Once addressed the Professional takes the "Reviewed" action again. If the Design Manager agrees, he/she takes the "Reviewed" action forwarding the request to the Portfolio Manager.
- E. The Portfolio Manager reviews the request and, if he/she has questions, comments or requires additional information, the Portfolio Manager takes the "Revise" action which forwards the comments back to the Design Manager to address. Once addressed the Design Manager takes the "Reviewed" action again. If the Portfolio Manager agrees, he/she takes the "Reviewed" action forwarding the request DGS Legal.
- F. DGS Legal reviews the request and, if Legal has questions, comments or requires additional information, Legal takes the "Revise" action which forwards the comments back to the Portfolio Manager to address. Once addressed the Portfolio Manager takes the "Reviewed" action again. Once all comments and questions are addressed, DGS Legal can take one of the following actions:

1. Disapprove: This action sends the process to finish and voids the request. Notification of the disapproval is sent to the Client Agency, Professional, Design Manager and Portfolio Manager.
2. Approve: This action sends a notice of approval to the Professional and includes the required specification paragraph noted below. The Professional then accepts the approval by agreeing to add the paragraph to the specifications and the process is sent to finish. A notice of approval is then sent to the Client Agency, Design Manager and Portfolio Manager.

“The above item has been approved by the Department as a proprietary item. No other item will be accepted. Section 9.6 and 9.7 of the General Conditions to the Construction Contract does not apply to the above item.”

Note: All Proprietary Request Items need to be submitted to the Design Manager prior to Design Development Approval.

SAMPLE ELECTRICAL PANEL SCHEDULE

LOAD SERVED	COND. GND.	WIRE SIZE	WIRE NO.	AMPS	POLES	POLE NO.	KW PER PHASE			POLE NO.	POLES	AMPS	WIRE NO.	WIRE SIZE	GND. COND.	LOAD SERVED
							A	B	C							
AHU-2	3/4	10	3	20	3	1	1.0			2	2	2	12	3/4	AHU-1	
						3	1.0	1.0	4	3	20	2	12			
						5		0.8	6							
EC-1	3/4	12	2	20	1	7	1.0		8	1	20	2	12	3/4	EC-2	
EC-3	3/4	12	2	20	1	9	5.5		10	1	20	2	12	3/4	EC-4	
EXTERIOR RECEPTACLE	3/4	12	2	20	1	11		5.5		12	1	20	2	12	3/4	CHILLER HEAT TAPE
RECEPTACLES	3/4	12	2	20	1	13	5.5			14	1	20	2	12	3/4	RECEPTACLES
FOLDING DOOR POWER	3/4	12	2	20	1	15		0		16	1	20	2	12	3/4	GARAGE DOOR POWER
CLOCK POWER/LIGHT	3/4	12	2	20	1	17	1.0	0		18	1	20	2	12	3/4	PUMPS CP-2, CP-3
CANOPY LETTERS	3/4	12	2	20	1	19	0	0.8		20	1	20	2	12	3/4	EXT. LIGHT CONTROL
RECEPTACLES	3/4	12	2	20	1	21	1.2			22	1	20	2	12	3/4	RECEPTACLES
RECEPTACLES	3/4	12	2	20	1	23		1.2		24	1	20	2	12	3/4	RECEPTACLES
RECEPTACLES	3/4	12	2	20	1	25		1.2		26	1	20	2	12	3/4	RECEPTACLES
RECEPTACLES	3/4	12	2	20	1	27	0.8			28	1	20	2	12	3/4	RECEPTACLES
RECEPTACLES	3/4	12	2	20	1	29		5.5		30	1	20				SPARE
BOOKSTORE TRACK	3/4	12	2	20	1	31		5.5		32	1	20	2	12	3/4	BOOKSTORE TRACK
BOOKSTORE TRACK	3/4	12	2	20	1	33	5.5			34	1	20				SPARE
BOOKSTORE TRACK	3/4	12	2	20	1	35		0		36	1	20	2	12	3/4	LOBBY DISPLAY TRACK
LOBBY DISPLAY TRACK	3/4	12	2	20	1	37		0		38	1	20	2	12	3/4	LOBBY DISPLAY TRACK
LOBBY DISPLAY TRACK	3/4	12	2	20	1	39	0			40	1	20				SPARE
SPARE	3/4	12	2	20	1	41		0		42	1	20				SPARE
TOTAL KILOWATTS PER PHASE							7.3	6.5	6.3	2.0	1.4	1.0				

TOTAL A PHASE KILOWATTS =	9.0	TOTAL A PHASE AMPS =	75
TOTAL B PHASE KILOWATTS =	7.9	TOTAL B PHASE AMPS =	66
TOTAL C PHASE KILOWATTS =	7.3	TOTAL C PHASE AMPS =	61
TOTAL 3 PHASE KILOWATTS =	24.2	TOTAL 3 PHASE AMPS =	67

DEPARTMENT OF GENERAL SERVICES
BUREAU PRE-CONSTRUCTION
1800 HERR STREET
HARRISBURG, PENNSYLVANIA

ADDENDUM NO. X

on

**PROJECT NO. DGS XXX-XX PHASE X
PROJECT TITLE - NAME OF INSTITUTION - LOCATION
PROFESSIONAL'S NAME AND ADDRESS**

ADMINISTRATIVE CHANGES – ALL CONTRACTS

Item 1 - *[for administrative items that apply to all contracts]*

GENERAL CHANGES – ALL CONTRACTS

Item 1 - *[for technical items that apply to all contracts]*

SPECIFICATION CHANGES – CONTRACT NO. DGS XXX-XX PHASE X.1 *[for .2, .3, .4 as applicable]*

Item 1 - Page 07800-4: Add the following material after Line 4:

“Porcelain Enamel Panels: Coil-coated vitreous porcelain enamel on 24 ga. steel, interior and exterior sheets, each finished both sides, exposed surface coating to . . .”

DRAWING CHANGES – CONTRACT NO. DGS XXX-XX PHASE X.1 *[for .2, .3, .4 as applicable]*

Item 1 - Sheet H-4: Delete Demolition Note No. 3, in its entirety.

PRE-CONSTRUCTION GEOTECHNICAL SERVICES AND SAMPLE RFP

<u>CONTENTS</u>	<u>PAGE</u>
Instructions to Professional	1
Sample Request for Proposal (RFP)	6
Sample Proposal Form	8
Specifications for Test Borings	10

INSTRUCTIONS TO PROFESSIONAL

1. SCOPE

- A. The Professional shall be responsible for obtaining Pre-Construction Geotechnical Services from a Foundation Consultant/Geotechnical Engineer that will include investigation and analysis of existing subsurface conditions. Pre-Construction efforts shall include:
 - 1) Investigation/analysis/recommendations for design of site work, including embankments, slopes, retaining structures, foundations and all underground structures, site and subsurface drainage, roads, and pavements.
 - 2) Analysis of costs for alternate designs.
 - 3) Analysis of excavation and fill problems.
 - 4) Analysis of on-site materials for use as structural and non-structural fill.
 - 5) Identification of requirements for materials imported for use as structural and non-structural fill.
- B. Construction Stage Geotechnical Quality Assurance Services will be addressed by a separate Proposal and Work Order immediately before the Construction Stage of the Project.

2. PREPARATION OF TEST BORING PLAN AND SPECIFICATIONS – SCHEMATIC SUBMISSION

- A. The Professional, in conjunction with the Civil/Structural Engineer, shall prepare RFP Documents for Pre-Construction Geotechnical Services, including the taking of test borings. These documents are to be submitted with the Schematic Design submission. If the footprint of the building is in question, the test boring plan shall be submitted immediately after Schematic Design when the footprint is approved.
- B. The Professional shall prepare a drawing showing the location of all test borings, auger borings, and test pits. The structure and foundation shall be indicated on the plan. Proposed ground floor and basement elevations shall be noted. The drawing shall be labeled TB-1, Test Boring Location Plan and Schedule.
- C. The drawing shall contain a schedule showing the test boring/auger boring/test pit numbers, surface elevation, contract depths, and actual depths. The surface elevation data is not to be filled in by the Professional until the elevations have been obtained by the surveyor at the time of staking out the borings. The actual depth is to be filled in when the subsurface investigation is completed.
- D. The Test Boring Plan shall include a Schedule of Contract Quantities summarizing the total quantities of proposed work, similar to the following example:

SCHEDULE OF CONTRACT QUANTITIES

<u>No. Holes</u>	<u>Earth Drilling</u>	<u>Rock Coring</u>	<u>Total Footage</u>
45 Std. Borings	600 Lin. Ft.	275 Lin. Ft.	875 Lin. Ft.
30 Auger Borings	180 Lin. Ft.	-----	180 Lin. Ft.
No of Soil Test Pits:		___ 4 ___ each	
No of Soil Infiltration Tests:		___ 2 ___ each	

- E. Each test boring shall be located exactly. Sufficient survey data must be furnished to enable an independent surveyor to stake out the locations. The footprint of the building must be firmly established with respect to the survey data mentioned above. Profile locations shall be taken into account in locating test borings.
- F. The Professional shall indicate all known surface and subsurface improvements that should be avoided when doing the test borings. Information shall be obtained from Pennsylvania One-Call, existing site drawings, interviews with Client Agency personnel, and site inspection. The test boring drawings shall also require the Foundation Consultant/Geotechnical Engineer/Drilling Contractor to contact Pennsylvania One-Call and shall list utility company contacts.
- G. The drawing shall contain a note to the effect that "all test borings shall be carried to the depths listed in the schedule, except where rock is encountered prior thereto, in which case, the coring shall extend five (5) feet into the rock, whether or not the final depth is more or less than the depth listed in the schedule, except that certain borings shall be carried to the contract depth regardless of the material encountered." The schedule shall indicate which borings must be extended to the contract depth regardless if rock is encountered prior to the contract depth. If necessary, the stipulated rock penetration may be increased 10, 15 or 20 feet into rock. The Professional shall determine the required rock penetration prior to soliciting proposals for the services.
- H. In areas of Pennsylvania where limestone formations are predominant, it shall be stipulated on the Test Boring Drawing that rock coring shall be carried to such depths that at least ten (10) feet of continuous bedrock has been intercepted below the bearing elevation so as to insure against stopping just above a thin rock shelf. Where caissons are used in limestone, test borings shall be taken at the location of each caisson.
- I. The contract depth of borings shall be such as to extend at least ten (10) feet below the bottom of footings and shall generally be listed in multiples of five (5) feet, at 10', 15', 20', etc. However, certain borings shall be carried to greater depth regardless of the material encountered. The number and depth of these borings shall be dependent on the size and complexity of the situation, but at least one (1) hole shall be so designated.
- J. Auger borings may be stipulated on the Test Boring Location Plan and Schedule in lieu of standard test borings for shallow utility lines where deemed appropriate by the Professional. Contract depth of auger borings shall be at least two (2) feet below the invert of the utility lines, but shall only be carried to such depth as to determine the elevation of rock, which may occur above the contract depth.
- K. At least two (2) test holes shall be designated on the test boring drawings as Water Observation Holes. Specifications will provide that before casings are withdrawn from these holes, a pipe is to be installed in these holes to a depth below the basement or lowest floor level. The pipe will be packed in coarse sand or gravel and will extend above grade so that during the period of design work, the ground water level may periodically be observed and recorded. The depth of water observation holes shall be fifteen (15) feet below the basement elevation and at least two (2) feet below the deepest excavation contemplated.
- L. The test borings are performed for the primary purpose of obtaining accurate design information. At the same time, the Professional recognizes the need for bidding Contractors to have knowledge of subsurface conditions. Therefore, the Test Boring Logs and Test Boring Location Plan and Schedule drawings shall be incorporated into the construction contract drawings as a Contract Document.
- M. The Professional shall edit and adopt the attached specifications for test borings for inclusion in the Foundation Consultant/Geotechnical Engineer's RFP.
- N. The Professional shall edit the Foundation Consultant/Geotechnical Engineer's sample RFP to reflect the planned type and quantities of items to be included in the Pre-Construction Geotechnical Services.

3. GEOTECHNICAL SERVICES

- A. A Foundation Consultant/Geotechnical Engineer, with a minimum of five (5) years' experience, shall be retained for the purpose of providing all Geotechnical Services. Geotechnical Services may be provided by the Professional's in-house staff if qualified. Services shall consist of:
 - 1) Stake-out of test borings by a surveyor.
 - 2) Conducting test borings.
 - 3) Furnishing full-time on-site inspection during the execution of the subsurface investigation.
 - 4) Laboratory testing of soils and of rock core specimens.
 - 5) Checking Drilling Contractor's work.
 - 6) Monitoring and recording groundwater elevations during design.
 - 7) Writing the Geotechnical Report with recommendations.
 - 8) Consultations during the Design Stage of the Project.
- B. Principal(s) shall be Registered Professional Engineer(s). Final reports shall be prepared, signed, and sealed by a Registered Pennsylvania Professional Engineer.
- C. The Professional shall submit the draft RFP for Pre-Construction Geotechnical Services through the work order process in e-Builder to the Design Manager for review and approval prior to soliciting proposals from Foundation Consultants/Geotechnical Engineers.
- D. The proposals shall be submitted on the Proposal Forms provided, similar to the Sample Proposal Form herein.

4. PROPOSALS AND AWARD

- A. Upon receiving approval of the RFP and Test Boring Location Plan and Schedule, the Professional shall solicit proposals from as many responsible and experienced Foundation Consultants/Geotechnical Engineers as may be deemed reasonable, preferably not less than three (3). Proposals shall be completed and signed and returned to the Professional with a transmittal letter on the letterhead of the Foundation Consultant/Geotechnical Engineer.
- B. The Professional is responsible for including the requirements of the Project Agreement for Professional Services in any RFP issued for services or any contract with the selected Foundation Consultant/Geotechnical Engineer.
- C. The Professional shall encourage comment by the Foundation Consultants/Geotechnical Engineers on the test boring program and make any changes deemed prudent in accomplishing the goal of providing support for the design of the foundation system most probable to be recommended.
- D. The Professional, when requesting proposals for Pre-Construction Geotechnical Services, must stipulate a date for receipt of proposals and a specific date on which all work must be completed.
- E. The Professional shall analyze proposal results and make its recommendation for award to the Bureau of Pre-Construction (BOPC). The Professional shall certify that the recommended consultant meets all qualification requirements. The Professional need not recommend the low proposal, but should justify the recommendation for a proposal that is not low.
- F. The BOPC will issue a Work Order for Pre-Construction Services and upon receipt the Professional shall authorize subsurface investigation work to proceed.

5. PERFORMING TEST BORING WORK: DIRECTION, INSPECTION, SOILS ENGINEERING WORK AND CHANGES

- A. The test boring work shall be properly directed by the Foundation Consultant/Geotechnical Engineer who shall provide full-time field inspection and professional oversight to achieve adequate and reliable results for the agreed upon investigation program. The Contractor's test boring logs are the basic records of subsurface data and are important. A primary purpose of inspection is to ensure

correctness of test boring logs. The Professional is responsible for managing the Foundation Consultant/Geotechnical Engineer to achieve the purpose of field inspection.

- B. If the Foundation Consultant/Geotechnical Engineer considers it necessary to make significant changes in the test boring program, the Consultant shall request approval from the Professional. Significant changes are considered to be increasing the depth of several borings by more than 10%, adding additional borings or changing the location of several borings. The Professional and/or its Civil/Structural Engineer should promptly make its recommendation to the Design Manager who shall authorize the change. Small changes in the program, such as adjustment of drilling depth by less than 10%, may be authorized by the Professional and the Foundation Consultant/Geotechnical Engineer.

7. OBSERVING GROUND WATER LEVELS

- A. It shall be the responsibility of the Foundation Consultant/Geotechnical Engineer to observe ground water levels at suitable intervals during the entire design stage, and to tabulate and include this information in the Soils Report and on the TB drawings. The Soils Report and TB drawings should be updated with groundwater observations made after completion of test boring drilling.

8. RELEASING TEST BORING INFORMATION

- A. The Professional's Geotechnical Report shall be made available to prospective bidding Contractors through the Bidding Module document folder in e-Builder. The Test Boring Location Plan and Schedule Drawing(s) and Test Boring Results Drawing(s) included in the Report shall be incorporated into the construction contract as a Contract Document. The remaining portions of the Geotechnical Report are provided for informational and/or guidance purposes only and are not to be relied upon for accuracy or completeness. Bidding Contractors are required to acknowledge a disclaimer on the accuracy, correctness or completeness of the full Report prior to submitting a bid.
- B. Soil and rock samples may be viewed by bidding Contractors at the premises of the Foundation Consultant/Geotechnical Engineer.

9. TIME OF COMPLETION GEOTECHNICAL REPORT

- A. The subsurface investigation must be completed prior to, and the recommendations shall be part of, the Design Development Submission. The BOPC may grant an extension of time for this requirement if necessary. Groundwater monitoring shall continue until the end of the Design Stage and the updated Geotechnical Report and final test boring drawings submitted with the Construction Document Submission.

10. THE GEOTECHNICAL REPORT

- A. The Geotechnical Report shall be prepared by the Foundation Consultant/Geotechnical Engineer. The report shall include:
 - 1) Project location map.
 - 2) Boring location plan.
 - 3) Scope of Report.
 - 4) Description of site.
 - 5) Description of proposed improvements.
 - 6) Description of field investigations, including equipment and procedures used.
 - 7) Description of laboratory testing program.
 - 8) Description of subsurface conditions.
 - 9) Description of ground and surface water conditions.
 - 10) Investigation, analysis and recommendations, including soil and rock bearing capacity and elevations of corresponding bearing stratum at each bore hole. Provide recommendations for site work, embankments, slopes, retaining structures, foundations, slabs, paving, subsurface drainage and all structures supported by earth.

- 11) Recommendations regarding the suitability of the excavated material for structural and non-structural backfill including any required and/or recommended treatments to the material to make it suitable. Include discussion on weather impacts and seasonal restrictions.
- 12) Recommendations regarding material specifications for imported materials for structural and non-structural backfill.
- 13) Recommended foundation system with cost analysis, if alternate systems are recommended.

B. There shall be appendices to the Report which shall include:

- 1) The Test Boring Location Plan and Schedule.
- 2) Test boring logs.
- 3) Test Boring Results Drawings.
- 4) Profile drawings showing cross-sections of conditions are to be included if beneficial in showing complex conditions. Soil profiles shall have proposed improvements overlaid.
- 5) Laboratory test results.
- 6) Groundwater levels tabulation.

11. PAYMENT

- A. Follow invoicing instructions included with the individual Work Order.
- B. The amount of the Contract will be adjusted, upon completion of the work, for the actual work completed, in accordance with the unit prices as submitted and accepted, covering additions to and deductions from the quantities included under the Schedule of Contract Quantities.
- C. The Professional may add a maximum of 10% to the invoices received for subcontracted services.

SAMPLE REQUEST FOR PROPOSAL
[on Professional's Letterhead]

Date: _____

To: *[Foundation Consultant/Geotechnical Engineer]*

Re: **REQUEST FOR PROPOSAL FOR PRE-CONSTRUCTION GEOTECHNICAL SERVICES**

Project Number: _____ Phase: _____ Proposal Due Date: _____

Project Title: _____

Location: _____ Client Agency: _____

Foundation Consultant/Geotechnical Engineer:

Thank you for your interest in submitting a proposal on Pre-Construction Geotechnical Services for the above referenced project for the Commonwealth of Pennsylvania and for which we are the Professional. Enclosed are the following documents:

- Test Boring Drawing(s) _____
- Specifications for Test Borings
- Sample Proposal Form

You, the Foundation Consultant/Geotechnical Engineer, are to facilitate the field work, provide full-time on-site inspection of the field work, verify the accuracy of the work, recommend and authorize changes, conduct laboratory testing of soils and rock core specimens, observe ground water levels at suitable intervals during the design process, provide a Geotechnical Report and provide related Engineering Services.

The Geotechnical Report, sealed by a Professional Engineer licensed in the Commonwealth of Pennsylvania, is to include the following:

- Project location map.
- Boring location plan.
- Scope of Report.
- Descriptions of Site, proposed improvements, field investigations, including equipment and procedures used, laboratory testing program, subsurface conditions, and ground and surface water conditions.
- Investigation, analysis and recommendations, including soil and rock bearing capacity and elevations of corresponding bearing stratum at each bore hole. Provide recommendations for site work, embankments, slopes, retaining structures, foundations, slabs, paving, subsurface drainage and all structures supported by earth.
- Recommendations regarding the suitability of the excavated material for structural and non- structural backfill including any required or recommended treatments to the material to make it suitable. Include discussion on weather impacts and seasonal restrictions.
- Recommendations regarding material specifications for imported materials for structural and non- structural backfill
- Recommended foundation system with cost analysis if alternate systems are recommended.

There shall be appendices to the Report which shall include:

- The Test Boring Location Plan and Schedule.
- Test boring logs.
- Test Boring Results Drawings.
- Profile drawings showing cross-sections of conditions are to be included if beneficial in showing complex conditions. Soil profiles shall have proposed improvements overlaid.
- Laboratory test results.
- Groundwater levels tabulation.

The Test Boring Location Plan and Schedule Drawing(s) and the Test Boring Results Drawing(s) included in the Geotechnical Report are to become Contract Documents. No broad disclaimers shall be made in the Report, excusing the Consultant of responsibility for the accuracy of the Test Boring Location Plan and Schedule Drawing(s) and Test Boring Results Drawing(s).

If the Foundation Consultant considers it necessary to make significant changes in the test boring program such as increasing the depth of several borings by more than 10%, adding additional borings or changing the location of several borings, it shall request approval from the Professional. Small changes in the program such as adjustment of drilling depth of 10% or less shall be authorized by the Foundation Consultant for payment per the contract Unit Price schedule.

The amount of the Contract will be adjusted, upon completion of the work, for the actual work completed, in accordance with the unit prices as submitted and accepted, covering additions to and deductions from the quantities included under the Schedule of Contract Quantities.

Construction Stage Geotechnical Quality Assurance Services will be addressed by a separate Proposal and Work Order immediately before the Construction Stage of the Project

A qualified Registered Pennsylvania Professional Engineer, familiar with the Project, must be available for consultations during the Design Stage of the Project.

Please include a brochure with your Proposal, indicating when your firm was established, and the Geotechnical experience and background of your principals.

Please submit your Proposal by _____ ***[insert date]***.

Very truly yours,

[PROFESSIONAL]

SAMPLE PROPOSAL FORM
[on Foundation Consultant/Geotechnical Engineer's Letterhead]

Date: _____

To: [Professional]

Proposer: [Foundation Consultant/Geotechnical Engineer]

Re: **PROPOSAL FOR PRE-CONSTRUCTION GEOTECHNICAL SERVICES**

Project Number: _____ Phase: _____ Proposal Due Date: _____

Project Title: _____

Location: _____ Client Agency: _____

Professional:

We propose to perform the Pre-Construction Geotechnical Services, including Field Work, Laboratory Tests and Engineering Services in accordance with your RFP dated _____ for the not-to-exceed amount of \$ _____ .

The amount of the Contract will be adjusted, upon completion of the work, for the actual work completed, in accordance with the unit prices as submitted and accepted, covering additions to and deductions from the quantities included under the Schedule of Contract Quantities.

Field Work to be performed by: _____ (attach copy of proposal)

Laboratory Tests to be performed by: _____ (attach copy of proposal)

Field work shall be completed by: _____ (insert date)

The Geotechnical Report shall be completed by: _____ (insert date)

Construction Stage Geotechnical Quality Assurance Services will be addressed by a separate Proposal and Work Order immediately before the Construction Phase of the project.

Proposer:

Foundation Consultant/Geotechnical Engineer Signature

Date

Foundation Consultant/Geotechnical Engineer Printed Name

Title

SCHEDULE OF CONTRACT QUANTITIES

[Professional to edit as required. Not all work/tests are required for all projects.

Insert Estimated Quantities for each item included]

	<u>ESTIMATED QUANTITY</u>	<u>UNIT COST</u>	<u>TOTAL</u>
A. <u>FIELD WORK</u>			
Earth Drill:	_____ Feet	@ \$ _____ / Foot	= \$ _____
Rock Coring:	_____ Feet	@ \$ _____ / Foot	= \$ _____
Mobilization:		Lump Sum	= \$ _____
Demobilization:		Lump Sum	= \$ _____
Auger Boring:	_____ Feet	@ \$ _____ / Foot	= \$ _____
Test Pits:	_____	@ \$ _____ / Each	= \$ _____
Thirty-Inch Long Undisturbed Samples:	_____	@ \$ _____ / Each	= \$ _____
Groundwater Monitoring Wells:	_____ Feet	@ \$ _____ / Foot	= \$ _____
Other as recommended:	_____	@ \$ _____ / _____	= \$ _____
		FIELD WORK SUBTOTAL	\$ _____

A.

B. <u>LABORATORY TESTS</u>			
Gradation/Classification:	_____	@ \$ _____ / Each	= \$ _____
Moisture Content:	_____	@ \$ _____ / Each	= \$ _____
Atterberg Limits:	_____	@ \$ _____ / Each	= \$ _____
Natural Density:	_____	@ \$ _____ / Each	= \$ _____
Direct Shear:	_____	@ \$ _____ / Each	= \$ _____
Triaxial:	_____	@ \$ _____ / Each	= \$ _____
Consolidation:	_____	@ \$ _____ / Each	= \$ _____
Unit Weight:	_____	@ \$ _____ / Each	= \$ _____
Other as recommended:	_____	@ \$ _____ / Each	= \$ _____
		LABORATORY TESTS SUBTOTAL	\$ _____

B.

C. <u>ENGINEERING SERVICES</u>			
Field (Boring) Inspection:	_____ Hours	@ \$ _____ / Hour	= \$ _____
Engineering Analysis & Geotech Report:		Lump Sum	= \$ _____
		ENGINEERING SUBTOTAL	\$ _____

C.

TOTAL NOT-TO-EXCEED PRICE (A+B+C): \$ _____

SPECIFICATIONS FOR TEST BORINGS

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1. DEFINITIONS

- A. **PROFESSIONAL:** The Architect or Engineer who is contracted with the Department to furnish design services.
- B. **FOUNDATION CONSULTANT:** The subcontractor to the Professional charged with investigation and reporting on soils conditions, hereinafter referred to as the "Consultant". The Consultant shall have in-house Geotechnical Engineering staff.
- C. **GEOTECHNICAL ENGINEER:** The responsible engineer or his engineer-representative in charge of the soils investigation and writing of the Geotechnical Report.
- D. **TEST BORING CONTRACTOR:** The entity engaged by the Consultant to perform test borings and other soil investigations, hereinafter referred to as the "Contractor". The Contractor may be an in-house division of the Consultant, but if he is an independent Contractor, he shall receive direction only from the Consultant.

2. SCOPE OF WORK

- A. This Contract includes the furnishing of all labor, materials, superintendence, tools, equipment, transportation, etc., and all means of construction required to drill test borings, excavate test pits, and perform certain other work as described herein and/or shown on the Drawings. All work shall be performed in accordance with the drawings and specifications and to the complete satisfaction of the Consultant and the Professional. It is the intent of this Contract to provide a complete, thorough and high quality survey to determine the character, thickness, and stratification of the subsurface materials, the compactness of granular soils, and the consistency of clay soils, including the taking of

samples, where required, and the depth to firm rock together with its general location, surface contour, and condition. This Specification for Test Borings is to govern the performance of the work required of the Contractor, who may be a division of the Consultant.

3. SCHEDULE OF WORK

- A. Before commencing work, the Contractor shall confer jointly with the representatives of the Consultant and the Institution and agree upon an exact progress schedule consistent with the requirements of the RFP. Borings and other operations shall be so confined that disruption of the Institution's traffic, parking, etc. is held to a minimum. Areas in which boring operations are in progress shall be roped off and, if required, be marked by lights at night.

4. VISIT TO SITE

- A. Before submitting proposals, the Contractor shall visit the location of the proposed work, verify all dimensions and existing construction, examine all existing conditions that may affect the prosecution of the work, and, in general, determine, to its satisfaction, the character and extent of the work included under the Contract. Failure to visit the site before submitting a proposal will not relieve the Contractor from furnishing all material, labor and equipment necessary to complete the Contract without additional compensation.

5. CONTRACT TERMS

- A. The Contract is based on the Schedule of Contract Quantities furnished by the Professional.
- B. The quantities listed in the Schedule shall not be exceeded, except upon authorization from the Consultant, who may increase or decrease the quantities as authorized by the Professional and the Bureau of Pre-Construction (BOPC).
- C. The amount of the Contract will be adjusted, upon completion of the work, for the actual work completed, in accordance with the unit prices as submitted and accepted, covering additions to and deductions from the quantities included under the Schedule of Contract Quantities.
- D. Test Boring work, including submission of records and reports, is to be completed by _____ *[insert date]*.

6. INDEMNITY AND INSURANCE

- A. The Contractor shall not commence work under this Contract until it has obtained all insurance required under this Specification and has submitted the executed certificates to the Consultant, and until such insurance has been approved by the Consultant and the Professional.
- B. Compensation Insurance. The Contractor shall take out and maintain during the life of this Contract, in amounts required by law, Worker's Compensation Insurance for all of its employees employed at the site of the Project. The Contractor shall, at all times, indemnify and save harmless the Institution, the Consultant, the Professional, and the Department against any and all such claims.
- C. Public Liability and Property Damage Insurance. The Contractor shall take out and maintain during the life of this Contract such Public Liability and Property Damage Insurance as shall protect it, the Institution, the Professional, and the Department from claims against any of them for damages for personal injury, including accidental death, as well as from claims for property damages, which may arise from operations connected with or caused by an operation or matter related to this Contract, whether such operations be by itself or by anyone directly or indirectly employed by it. Hazards insured against for property damage liability shall include underground objects to the extent that any such exposure exists. The minimum insurance limits shall be nondeductible and shall be not less than:
 - 1) Contractor's Public Liability and Property Damage

- (i) \$250,000/\$1,000,000 - Bodily Injury
 - (ii) \$250,000/\$1,000,000 - Property Damage
- 2) Automobile Public Liability and Property Damage
- (i) \$250,000/\$1,000,000 - Bodily Injury
 - (ii) \$250,000/\$1,000,000 - Property Damage
- D. The Public Liability, Bodily Injury and Death policies shall be written on an occurrence basis. The Public Liability and Property Damage Insurance Policy shall contain a Contractual Liability clause covering the liability assumed by the Contractor under Paragraph 6f of this Specification.
- E. Certificates. The Contractor shall submit to the Professional the executed certificates covering all insurance required by this Specification.
- 1) Each certificate and insurance policy shall contain therein, or have contained in a rider attached thereto and made a part thereof, a clause to the effect that the insurer will notify the insured and the Institution, the Consultant, the Professional, and the Department in writing ten (10) days prior to cancellation of policy.
- F. Contractor's Liability. Under this Contract, the Contractor has the status of independent Contractor and as such shall properly safeguard against any and all injury or damage to the public, to public and private property, and materials. The Contractor shall, at all times, save and hold harmless and indemnify the Institution, the Professional and its Consultants from and against all losses, damages, expenses, claims, demands, suits, and actions arising out of , or incurred during the Work performed under this Contract, including but not limited to, all claims for personal injuries and property damages, except as may be occasioned by the negligence, gross negligence, or willful misconduct of the Institution, the Professional or its Consultants, as determined in accordance with Pennsylvania law. This shall not be construed to limit the Commonwealth's rights, claims or defenses which arises as a matter of law or pursuant to any other provision of the Contract. This shall not be construed to limit the sovereign immunity of the Commonwealth and its agencies, officers, and employees, or to subject any Commonwealth party to any liability not expressly authorized by law.

7. CONTRACTOR'S PLANT AND EQUIPMENT

- A. All plant, equipment and methods to be used by the Contractor shall be subject to approval by the Consultant and Professional before the work has begun. However, approval of the equipment shall not be construed as approval of the performance thereof. Additional equipment and methods shall be provided where ordered by the Consultant to perform the work satisfactorily according to the Specifications.
- B. Unless specifically permitted in writing, the drilling equipment shall be standard, modern, self-contained core drills and shall be equipped with oil hydraulic feed heads. Hand feed or screw feed drilling will not be acceptable.
- C. The drive weight assembly for obtaining standard penetration split barrel sampler samples shall consist of a driving head and a 140 lb. weight with a 30-inch free fall. Special precautions shall be taken to insure that the energy of the falling weight is not reduced by friction between the drive weight and the guides or the hoisting line and any pulleys. A wire cable is not acceptable for hoisting and releasing the drive weight.

8. WORKERS AND SUPERINTENDENCE

- A. The Contractor shall, at all times, have a thoroughly competent driller and a capable assistant or assistants on each rig in operation and a competent operator for any excavating equipment employed. The Contractor's representative responsible for the preparation of the field logs shall be skilled in the identification and description of the various types of soil, rock, and other subsurface materials that may be encountered.

- C. The Contractor shall provide to the Consultant's inspector two (2) additional copies of the driller's log for distribution to the Professional, as each boring is completed, in order that they can be kept fully apprised of the status of the work.

15. INSPECTION

- A. The work will be conducted under the general direction of the Consultant and shall be subject to inspection by its appointed inspector who will observe and report on the manner and quality of performance and convey their directions to the Contractor. Neither the presence nor the absence of an inspector shall relieve the Contractor of its responsibility to, at all times, execute the work in accordance with the Specifications.
- B. No drilling or excavation shall be performed except in the presence of the inspector of the Consultant unless specific permission has been granted to the contrary. The inspector will check the logs of the borings to determine that the information designated herein is being obtained. The Contractor shall see that all samples are properly boxed and stored in a suitable place or shipped or delivered to the designated destination. Containers of all samples shall be marked as hereinafter specified.

16. EARTH BORINGS

- A. Borings in earth shall be made by the cased-hole method. A "Hollow-stem auger" may be used upon approval by the Consultant and Professional. Soil samples shall be obtained by means of a sampling spoon attached to the end of the hollow drill rod, which shall be lowered to the bottom of the previously washed hole and driven into the undisturbed soil below the bottom of the casing.
- B. Cased hole borings in materials other than rock shall be made by driving a pipe casing and removing the soil from within the casing by washing. The casing shall be extra heavy pipe, 4 inch nominal inside diameter. It shall be driven vertically through earth and other materials, including boulders, to such depth below the ground surface as may be directed or required.
- C. The casing shall be driven down without washing, in stages of not more than five (5) feet, after which the material shall be cleaned out to the bottom of the casing with a jet of water from the end of the wash pipe or a rotary bit. The wash pipe shall be churned up and down in the casing and gradually lowered while the soil is being washed out. If necessary, a chopping bit may be attached to the lower end of the wash pipe. Pulling the casing out of the hole for the purpose of cleaning it and then introducing it back into the hole will not be permitted. Only those cleaning methods hereinbefore described will be permitted. Simultaneous washing and driving of the casing will not be permitted. A continuous record shall be kept of the blows per foot in the driving of the casing. The elevations between which water was used in driving the casing must be recorded. Where approved by the Consultant and the Institution, limited blasting with small charges will be permitted for the removal of small boulders or other obstructions that cannot be conveniently removed otherwise. Before blasting, the casing shall be pulled up to such extent as will protect it from damage. In formations other than rock, casing must be used all the way down to rock or to a point just above the location where the last split spoon sample is taken. Advancing without driving casing will not be permitted. If blasting is approved, the Contractor shall be insured for same and provide a Certificate of Insurance, as requested.
- D. The weight of hammer for driving the casing shall be three hundred (300) pounds and the drop shall be eighteen (18) inches.
- E. During the process of driving casing, split barrel spoon drive samples shall be obtained. In general, soil samples shall be obtained at the ground surface and at the beginning of each stratum change and at intervals not to exceed three (3) feet from the end of one sample to the beginning of another. At such locations where samples are to be obtained, driving or washing of the casing shall be stopped, the loose material removed from the hole, the chopping bit or rotary bit removed from the wash pipe and replaced by an approved spoon sampler.

- F. The sample spoons shall be of the split type as defined by ASTM D1586 and shall have a two (2) inch O.D. and a 1.375 inch - 1.5 inch I.D. and shall be eighteen (18) inches long. They shall be equipped at the top with a reliable ball and check valve. If difficulty is experienced in recovering samples, the split tube samplers shall be equipped with a flap valve or basket type retainer.
- G. The samples shall be obtained by mechanically driving the split barrel sampler eighteen (18) inches into the undisturbed material below the bottom of the casing. A record shall be kept of the number of blows for each six (6) inches of penetration. These samples shall be removed from the hole in such a manner so as to provide a true sample of the soil formation from which they are taken. If a sample is not obtained the first time, the spoon shall be driven again to a depth of eighteen (18) inches below the bottom of the casing. Should the material be so incohesive that the second driving of the spoon fails to secure a sample, a spoon with a flapper valve or basket retainer shall be driven. If such spoons are used, the flap valve or basket retainer may remain in place only at such times as may be approved by the Consultant. In no event shall samples be obtained by driving and removing the casing. All soil samples, immediately upon removal from the hole, shall be placed in wide mouth, rubber sealed, screw-top, eight (8) ounce clear glass jars and properly and clearly labeled for identification and packed in the wooden core boxes as hereinafter specified. Sample jars shall be approximately two (2) inches in diameter and 4.5 inches high.
- H. When sampling above the water table, samples shall be obtained from a dry hole. Below the water table, the casing shall be filled with water and the water level maintained with the hole at or above ground water level. Any sudden loss of water shall be noted on the drilling log.
- I. Where, in the opinion of the Consultant, it is necessary to more accurately establish the elevation of any major change in material, a continuous sample shall be taken to a depth not to exceed five (5) feet below the bottom of the casing. These continuous samples shall be taken with a split spoon repeatedly driven, extracted, and the sample removed a sufficient number of times to obtain the required continuous five (5) feet sample. Such samples from continuous sampling need not be retained unless a different type material is encountered or unless directed otherwise by the Consultant.
- J. To facilitate determination of the relative resistance of the various strata, the split-spoon sampler shall be driven by a 140 pound weight hammer having a thirty (30) inch drop. In no case will any deviation from maintaining constant impact energy be permitted in obtaining the penetration resistance per stratum.
- K. Borings shall be considered as earth borings wherever the usual practice of chopping, washing and driving of casing will permit penetration through the soil.

17. THIN WALL TUBE SAMPLING

A. Undisturbed Samples:

- 1) Three inch O.D. thin-wall (Shelby tube) samples shall be used for obtaining undisturbed soil samples, at locations directed by the Consultant. The thin-wall sampler shall be approximately 30 inches long, and shall consist of 13 or 16 gauge, 3.0 inch O.D. brass or steel tubing, with a beveled cutting edge and positive inside clearance as defined by ASTM D1587. The inside of the tube shall be smooth, clean, and free from rust. The use of any other type of sampler for obtaining undisturbed samples will be subject to the approval of the Consultant.
- 2) If the soil to be sampled with the thin-wall sampler is sufficiently soft to warrant it, at the discretion of the Consultant, an approved stationary piston sampler shall be employed in conjunction with the thin-wall tube to obtain the sample. When a sample is to be taken, loose and disturbed material shall be removed to the bottom of the pipe casing and final cleaning shall be done with a clean-out auger, so performed that the soil immediately below the bottom of the casing shall remain as undisturbed as possible. The thin-wall sampler shall be forced, and not driven, into the soil with a downward pushing or jacking action, employing suitable block and tackle arrangement or other acceptable device when necessary. After the sampler has been pushed to the desired depth, a period of rest or adjustment of, at least, ten minutes shall be allowed prior to any further

operations with the sampling device. After suitable rest or adjustment period, the drill rod shall be rotated at least two full turns to shear the sample from the soil at the cutting edge of the sampler.

- 3) All undisturbed samples recovered are to be sealed with wax, and the ends shall be capped, wrapped with friction tape, and then dipped in wax. The tubes are to be labeled in the same manner as the jars. Immediately after the Shelby tube is removed from the hole, it shall be sealed as follows:
 - B. Top of the Shelby Tube - A reamer shall be used for removal of cutting and disturbed material. The inside of the tube shall be thoroughly cleaned and wiped with a dry rag to insure the bonding of wax to the tube wall. The wax is to be heated to a liquid state and then allowed to cool until a thin film of cooled wax shows on the surface before being used. The wax is to be poured into the Shelby tube in two one half inch layers allowing sufficient time for the first layer to cool before the second layer is poured. The end of the Shelby tube shall then be capped, and friction tape shall be wound around the joints of the Shelby tube and caps. All other holes in the tube shall then be sealed using friction tape.
 - C. Bottom of the Shelby Tube (Cutting Edge) - Soil shall be removed from the bottom of the Shelby tube to a depth of three quarter of one inch or until undisturbed material is in evidence. The bottom of the Shelby tube shall then be prepared to the same specifications as the top of the Shelby tube. The Shelby tubes must always be stored and transported in an upright position and protected against impact or vibrations of any type, and shall be delivered to the Professional as directed.
 - D. The wax to be used shall be of the low shrinking microcrystalline type.
 - E. Each undisturbed sample tube shall be labeled to show clearly the number of the boring, the number of the sample, and the depth below the surface from which the sample was obtained.

18. ROCK CORE BORINGS

- A. Rock core borings shall be made at locations that will be designated by the Consultant for the purpose of ascertaining the character and location of rock, if there is any at such locations. Steel casings, of the type and diameter and driven in the manner, hereinbefore specified, shall penetrate to bedrock. In general, cores in bedrock shall extend the minimum depth shown on the Drawings.
- B. Bed rock will be considered to have been reached when the material cannot be penetrated by the casing, spoon sampler or by chopping bit or by any other means other than by diamond drilling; provided that diamond drilling below such levels results in the recovery of a rock core and not in materials other than rock such as hardpan. When drilling through bed rock or boulders, the chopping bit shall be used to break up all disintegrated material, and the casing shall be firmly seated on hard rock by driving and washing out before starting to drill.
- C. Boring in hard rock or strata shall be made by the diamond bit method by using a suitable approved apparatus that will retain a core of not less than 2-1/8 inch diameter (NX size). All core barrels shall be of the double tube swivel type and if the material is soft rock, a diamond bit (NXM type) shall be used, equipped with a double tube core barrel, similar and equal to Sprague and Henwood Series M, of such construction that the drilling water is fed to the bit without coming in contact with the core. An accurate record shall be kept of all materials penetrated and the depth of each boring. In the event the rock is of such composition that less than 50 percent core recovery is obtained, or that materials penetrated are other than rock, then standard split spoon samples shall be taken, in a continuous manner, as previously described under earth borings. Samples of the materials penetrated at each change in stratification shall be obtained. Special care shall be taken to obtain split spoon samples of rock that grinds to a sandy condition when cored.
- D. As large a percentage as possible of cores shall be recovered. The Contractor shall regulate the speed of the drill and the flow of water and shall remove the core as frequently as necessary in order to obtain the maximum percentage of recovery. Special care shall be taken when the character of the rock being penetrated is uncertain. Should it prove impractical at any given depth to obtain a rock core or should a seam be encountered, particular care should be taken to recover accurate samples

of the materials penetrated at such locations and the correct limits between which no cores were obtained.

- E. All rock cores shall be placed in suitable longitudinally partitioned boxes constructed of dressed lumber, or polyethylene, in general accordance with the arrangement and dimensions shown in Figure No. 1, which is included with and forms part of these Specifications. If polyethylene is used, it must be white or colorless and at least 3 mm thick. Wooden boxes must be constructed of at least 5/8 inch thick dressed lumber and have partitions set in grooves at ends and in bottom to prevent lateral movement. Core boxes shall be approximately four (4) feet long, one (1) foot wide and two and one-fourth (2-1/4) inches inside depth, equipped with all necessary partitions, covers, hinges, spacer blocks and hooks for securing the cover. Core boxes shall be of new construction and unmarked. Used core boxes, regardless of condition, will not be acceptable.
- F. All rock cores shall be arranged in the longitudinally partitioned boxes in descending sequence with the uppermost core in the partition adjacent to the hinges and at the left when facing the hasp side of the box. All soil samples, as hereinbefore discussed, shall be placed in the core boxes in their relative position as obtained from the hole. Under no circumstances shall soil samples or rock cores from more than one hole be placed in any one box or set of boxes.

19. AUGER BORINGS

- A. Auger borings shall be drilled to depths indicated on the drawing, unless solid rock is encountered prior thereto, in which case the boring shall extend only a depth necessary to definitely determine the distance of the rock stratum below the surface.
- B. These borings shall be made with a hand or power auger not less than one and one-half (1-1/2) inch diameter or, at the option of the Contractor, the borings may be made with a pneumatic drill or by the method hereinbefore specified for each boring.
- C. Contractor shall record and report on the types of subsurface materials encountered and also the elevation of any rock strata encountered.

20. GROUND WATER OBSERVATIONS

- A. During the course of drilling, the ground water level shall be noted when first encountered, at which time advance of penetration and/or casing shall be momentarily halted until the water elevation in the hole attains apparent equilibrium. After measuring and recording such water elevation, advance of the hole may be resumed. If more than one (1) day is required to complete a boring, then water readings shall be taken the morning of the next day prior to the commencement of boring operations. In addition, ground water readings shall be taken at the completion of each boring and at a time at least twenty-four (24) hours after removal of the casing, provided that the hole remains open.
- B. Any loss of water during coring operations shall be recorded and any artesian flow of water shall be noted.
- C. The elevation of ground water shall be carefully recorded for each boring together with the dates when the measurements were taken and the number of hours after completion of the boring. If no water is encountered, it shall be so indicated by stating, "No water encountered."
- D. Ground water observation wells shall be constructed as follows: when the hole has been completed, a 1-1/4 inch pipe shall be lowered to fifteen (15) feet below the basement floor level. The hole shall then be filled with coarse sand or small gravel. After the hole has been filled, the casing shall be removed. The pipe shall extend twenty-four (24) inches above grade and be equipped with a screw cap with a vent hole. The pipe extending above grade shall be protected from traffic with a 4" x 4" oak post driven into the ground, and marked "DO NOT DISTURB."
- E. Ground water observation wells shall be abandoned by the Lead Contractor after construction of the project is complete according to the PA DEP Groundwater Monitoring Guidance Manual, Document Number 383-3000-001, latest edition, Chapter 7, "Well Abandonment Procedures".

21. TEST PITS

- A. Test pits shall be excavated at locations designated by the Professional or Consultant for the purpose of closely examining the upper soil strata and/or rock surface and to secure bulk soil samples. All test pits shall be excavated to such depths as required by the Consultant. These depths will generally not exceed twelve feet.
- B. The test pits shall be excavated with mechanical equipment of sufficient power to loosen and remove any soils capable of being penetrated by the methods described in the section of this Specification concerning earth boring. No rock excavation will be required.
- C. All excavations shall be of sufficient size and with such side slopes that an Inspector may safely descend and examine the sub-soil. Each excavation shall be made at the rate ordered by the Inspector who may stop the digging at any time in order to examine the excavation and/or secure bulk samples.
- D. All excavations shall be promptly back filled and compacted when so ordered by the inspector.
- E. At the direction of the inspector, the Contractor shall manually obtain, with a shovel or spade, such bulk samples, weighing about sixty pounds each, as the Inspector shall require. Each such sample shall be placed in an air tight, moisture proof container of adequate strength and shall be delivered as the Professional directs.

22. MARKING AND DISPOSITION OF SAMPLES

- A. All soil samples shall be marked and identified with legible labels which shall contain the Project Number and Title, the number of the boring, the elevation or depth from which the sample was taken (and surface elevation), the sample number, the blow count, the date and any other information that may be helpful in determining the character of the subsurface conditions. All soil sample jars are to be packed in the wooden core boxes as previously specified.
- B. All rock cores are to be placed in suitable wooden boxes as hereinbefore specified. A copy of the boring log shall be glued to the inside face of the box cover. The boxes are to be neatly marked on the inside and outside of the cover as follows:
 - 1) Project No. DGS XXX-XX
 - 2) Boring No. _____
 - 3) Box ____ of ____ boxes
 - 4) In addition, the outside of each end shall bear:
 - 5) Boring No. _____
 - 6) Box _____ of _____ boxes
- C. All samples of soil and rock shall be delivered to the Foundation Consultant and placed in an orderly fashion where they will be readily available for review by the Professional and the Department and future bidders on the Construction Project. All samples shall be preserved until disposal thereof is authorized by the Department and the Professional, but no sooner than twelve months after the date of substantial completion of the project. Disposal shall not be authorized if there are any soils-related disputes or potential disputes.

23. RECORDS AND REPORTS

- A. During the progress of each boring, the Contractor shall record what size, type and length of casing is used, and keep a continuous and accurate log of the materials encountered. Where driving is permitted on the sampler, as when recovering ordinary dry samples, the Contractor shall also keep a record of the number of blows required to drive the sampler spoon for each six (6) inches of penetration as well as the Standard Penetration ("N" Value) blows per foot.
- B. Test Boring Logs shall include the following items, minimum:

1) General

- a) Designation of test boring.
- b) Location of test boring
- c) Project Title
- d) Drilling Contractor
- e) Client
- f) Date
- g) Equipment
- h) Driller
- i) Inspector/signature
- j) Ground elevation at hole.

2) Earth Borings

- a) Results of all boring details of each hole arranged in tabular form giving full information on the vertical arrangement, thickness and classification of the materials penetrated.
- b) Depth limits of bottom, type and number of each sample taken. All samples shall be numbered consecutively.
- c) Number of blows required for each six (6) inch penetration of split-spoon samples and "N" Value.
- d) Location and ID of each sample.
- e) Size, length and elevation of bottom of casing used in each bore hole.
- f) Elevation of ground water table at each hole, and time of observation.

3) Soils shall be classified and described in accordance with ASTM 2487 and shall include the following observations:

- a) Kind: Topsoil, fill, loam, silt, clay, sand, gravel, or other material.
- b) Color: Brown, grey, blue, red, or other color.
- c) Moisture: Dry, moist, wet, very wet, or other condition.
- d) Consistency: Gravel - loose, compact
Sand - loose, compact
Clay and Silt - soft; medium; hard

4) Rock Core Borings:

- a) Length of core, length of recovered sample and % recovery.
- b) Elevation at which rock was encountered.
- c) Elevation of each change in type of rock.
- d) Elevation of bottom of hole.

5) Description of rock in accordance with the following classifications:

- a) Kind: Shale, slate, limestone, sand-stone, gneiss, etc.
- b) Condition: Broken, fissured, disintegrated, laminated, solid, etc.
- c) Hardness: Soft, medium, hard, very hard.

6) Note drilling events such as cave-ins, loss of fluid, etc.

C. On a cover sheet the Contractor shall describe the equipment used, including descriptions of sampler mechanisms, core drills, hammer weights and fall distances, etc. Include a legend of all symbols used on the logs.

D. The Contractor or the Consultant, as determined by the Consultant, shall prepare Test Boring Results Drawings. They shall be the same size as the Test Boring Location Plan with a similar title block and all boring elevations will be drawn to scale and with reference to an established datum, represented

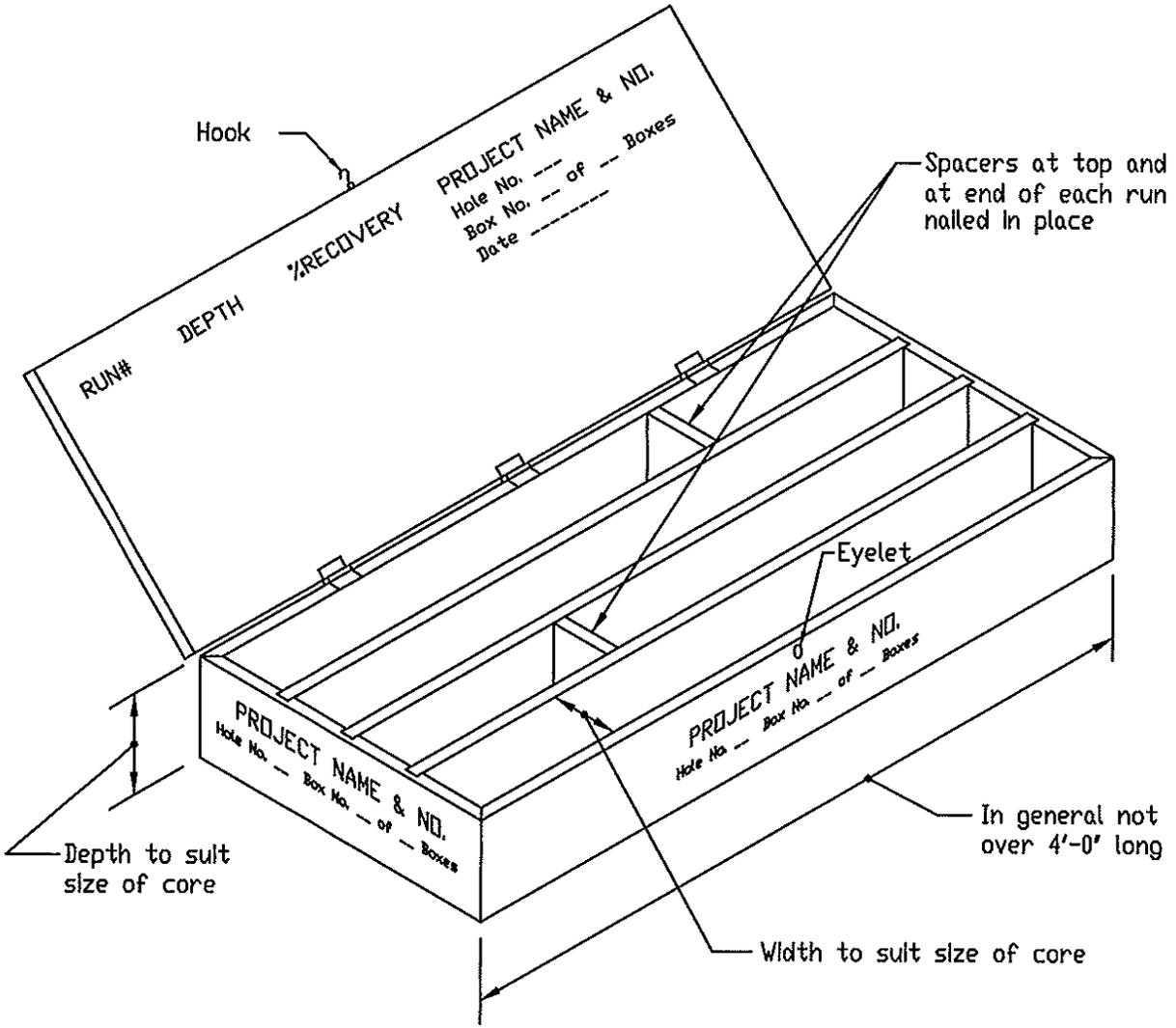
by a heavy dark line at each end of the tracing and marked "Datum". Comply with the format included with this Specification identified as: Sample Test Boring Results Drawing.

24. DIRECTIVES

- A. The Consultant or his representative reserves the right to direct the Contractor as follows:
- 1) The sequence of drilling.
 - 2) To stop the drilling of any of the holes at any level within the depth indicated on the schedule.
 - 3) To drill any of the borings to a greater depth than shown on the schedule. The additional depth desired shall be determined at the time the work is being executed and generally shall be to satisfactory bearing. If material at scheduled depth is of poor quality, the Consultant should contact the Professional for instructions. In no event shall any test boring which indicates an inferior bearing quality of the soil at the bottom of the boring be abandoned or discontinued without the express permission of the Consultant.
 - 4) To drill any holes in addition to those shown on the Drawings.
 - 5) The Consultant shall not exceed the authority of his agreement from the Professional, who shall be kept apprised of changes. The Professional shall keep the BOPC Design Manager apprised of changes.

25. NOTIFICATION TO PUBLIC UTILITIES

- A. The Contractor shall comply with House Bill No. 2543 (Act 287 of 1974) enforced by The Pennsylvania One Call system.



NOTES:

1. Labeling for core box shall be placed on outside and inside of cover and outside on each end and front.
2. Depths of top and bottom of each run shall be marked on the appropriate edge or spacers in the box.
3. All labeling and elevations shall be marked with water-resistant ink.

DGS STANDARD CORE BOX

FIGURE NO. 1

CONSTRUCTION STAGE GEOTECHNICAL QUALITY ASSURANCE SERVICES AND SAMPLE RFP

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INSTRUCTIONS TO PROFESSIONAL

3. SCOPE

- A. The Professional shall be responsible for obtaining Construction Stage Geotechnical Quality Assurance (QA) Services from a Foundation Consultant/Geotechnical Engineer.

4. GEOTECHNICAL SERVICES

- A. A Foundation Consultant/Geotechnical Engineer, with a minimum of five (5) years' experience, shall be retained for the purpose of providing Construction Stage Geotechnical QA Services, including soil related tasks (Special Inspections) required by Chapter 17 of the International Building Code (IBC) which will allow the Professional to execute the Certificate of Compliance at the completion of the project. Services shall consist of:
- 1) Review reports from Contractor's Quality Control Agency.
 - 2) Perform earthwork QA including field and laboratory tests.
 - 3) Perform Engineering and Geotechnical Consultations.
- B. Where caissons are used, the Foundation Consultant/Geotechnical Engineer shall record pertinent data on each caisson, including his descent into the shaft to verify bearing conditions.
- C. Principal(s) shall be Registered Professional Engineer(s). The Engineer making decisions and recommendations shall be a Registered Pennsylvania Professional Engineer.
- D. The proposals shall be submitted on Proposal Forms provided, similar to the Sample Proposal Form herein.

5. PROPOSALS AND AWARD

- A. It is preferred that the Professional engage the same firm that provided the Pre-Construction Geotechnical Services, however there are occasions on projects where contracting with a separate Construction Phase firm is a reasonable and acceptable approach. An example would be on a simple project where the Design Phase Foundation Consultant/Geotechnical Engineer is located further away from the project site than is feasible without incurring excessive travel costs, or when the Design Stage firm's proposal is not competitive. The Professional should discuss with the Design Manager whether or not to seek proposals from firms in addition to those engaged during the Pre-Construction Phase.
- C. The Professional shall solicit proposals from as many responsible and experienced Foundation Consultants/Geotechnical Engineers as may be deemed reasonable, preferably not less than three (3). Proposals shall be completed, signed, and returned to the Professional with a transmittal letter on the letterhead of the Foundation Consultant/Geotechnical Engineer.
- D. The Professional is responsible for including the requirements of the Project Agreement for Professional Services in any RFP issued for services or any contract with the selected Foundation Consultant/Geotechnical Engineer.

- E. The Professional shall analyze the proposal results and make its recommendation for award to the Bureau of Pre-Construction (BOPC). The Professional shall certify that the recommended consultant meets all qualification requirements. The Professional need not recommend the low proposal, but should justify its recommendation for a proposal that is not low.
- F. The BOPC will issue a Work Order for Construction Stage Services and upon commencement of construction, the Professional shall coordinate closely with the Bureau of Construction (BOC) regarding the services to be provided.

6. **PAYMENT**

- A. Follow invoicing instructions included with the individual Work Order.
- B. The amount of the Contract will be adjusted, upon completion of the work, for the actual work completed, in accordance with the unit prices as submitted and accepted, covering additions to and deductions from the quantities included under the Schedule of Contract Quantities.
- C. The Professional may add a maximum of 10% to the invoices received for subcontracted services.

SAMPLE REQUEST FOR PROPOSAL
[on Professional's Letterhead]

Date: _____

To: [Foundation Consultant/Geotechnical Engineer]

Re: **REQUEST FOR PROPOSAL FOR CONSTRUCTION STAGE
GEOTECHNICAL QUALITY ASSURANCE SERVICES**

Project Number: _____ Phase: _____ Proposal Due Date: _____

Project Title: _____

Location: _____ Client Agency: _____

Foundation Consultant/Geotechnical Engineer:

Thank you for your interest in submitting a proposal on Construction Stage Geotechnical Quality Assurance Services for the above referenced project for the Commonwealth of Pennsylvania and for which we are the Professional. It is anticipated that the construction will start in **[Month and Year]** and be completed within **[Number of Months]**.

We have pre-filled in the quantities on the proposal form for the desired work elements. If you want to propose different approaches/work elements, please do so in a written narrative accompanying the proposal. Do not modify the proposal form.

The Work Order will be issued on a unit price, not-to-exceed basis. The total authorized amount cannot be exceeded. If it is determined during the course of the project that additional quantities of services are required, a separate Work Order will be written.

On-site hourly rates quoted must include travel time and expenses, generation of hand-written field reports, and equipment costs for the tests (including nuclear density gauge), clerical support, copies and postage. Payment will only be made for actual hours on site with a four (4) hour minimum. Payment will not be made for travel time. The method for keeping track of hours on site shall be approved by the Department. The time required of the Professional Engineer in Charge to supervise and schedule the on-site monitoring and testing is also to be included in these rates. Sample pick-up and transportation charges must be included in the laboratory test prices.

The Technician/Geologist/Engineer will not act as a foreman nor perform other duties of the Contractor. They are not authorized to revoke, alter, relax, enlarge, or release any requirements of the specifications, nor to approve or accept any portion of the work.

The Technician/Geologist/Engineer must notify the Professional, the Department, and the Contractor immediately of any work or tests that fail to meet the contract requirements. They shall also provide the Bureau of Construction (BOC) Project Manager (PM) or Assistant Project Manager (APM) with a report prior to leaving the site each day.

Construction earthwork monitoring is not to duplicate the full service Quality Control Testing required of the Contractor. It is only to provide oversight of the Contractor's Quality Control Agent by reviewing QC test results, making sufficient site visits to confirm that the Contractor and his QC Agent are sampling and performing soil related tasks (Special Inspections) required by Chapter 17 of the International Building Code

(IBC) which will allow the Professional to execute the Certificate of Compliance at the completion of the project.

Please submit your Proposal by _____ ***[insert date]***.

Very truly yours,

[PROFESSIONAL]

SAMPLE PROPOSAL FORM
[on Foundation Consultant/Geotechnical Engineer's Letterhead]

Date: _____

To: [Professional]

Proposer: [Foundation Consultant/Geotechnical Engineer]

Re: **PROPOSAL FOR CONSTRUCTION STAGE
GEOTECHNICAL QUALITY ASSURANCE SERVICES**

Project Number: _____ Phase: _____ Proposal Due Date: _____

Project Title: _____

Location: _____ Client Agency: _____

Professional:

We propose to perform the Construction Stage Geotechnical Quality Assurance Services in accordance with your RFP dated _____ for the not-to-exceed amount of \$_____.

The amount of the Contract will be adjusted, upon completion of the work, for the actual work completed, in accordance with the unit prices as submitted and accepted, covering additions to and deductions from the quantities included under the Schedule of Contract Quantities

On-site hourly rates quoted must include travel time and expenses, generation of hand-written field reports, and equipment costs for the tests (including nuclear density gauge), clerical support, copies and postage. Payment will only be made for actual hours on site with a four (4) hour minimum. Payment will not be made for travel time. The method for keeping track of hours on site shall be approved by the Department. The time required of the Professional Engineer in Charge to supervise and schedule the on-site monitoring and testing is also to be included in these rates. Sample pick-up and transportation charges must be included in the laboratory test prices.

Proposer:

Foundation Consultant/Geotechnical Engineer Signature

Date

Foundation Consultant/Geotechnical Engineer Printed Name

Title

SCHEDULE OF CONTRACT QUANTITIES

[Professional to edit as required. Insert Estimated Quantities for each item included]

	<u>ESTIMATED QUANTITY</u>	<u>UNIT COST</u>	<u>TOTAL</u>
D. <u>FIELD WORK</u>			
Periodic on-site monitoring and testing:			
Technician:	_____ Hours	@ \$ _____ / Hour	= \$ _____
Geologist:	_____ Hours	@ \$ _____ / Hour	= \$ _____
Engineer:	_____ Hours	@ \$ _____ / Hour	= \$ _____
Full time deep foundation monitoring:	_____ Hours	@ \$ _____ / Hour	= \$ _____
On-site Engineering Consultation:	_____ Hours	@ \$ _____ / Hour	= \$ _____
	FIELD WORK SUBTOTAL		\$ _____
			A.

E. <u>LABORATORY TESTS</u>			
Proctor (STD):	_____	@ \$ _____ / Each	= \$ _____
Proctor (MOD):	_____	@ \$ _____ / Each	= \$ _____
Others as recommended:	_____	@ \$ _____ / Each	= \$ _____
	LABORATORY TESTS SUBTOTAL		\$ _____
			B.

F. <u>ENGINEERING SERVICES (Office)</u>			
Review reports developed by the Contractor's QC Agency:	_____ Hours	@ \$ _____ / Hour	= \$ _____
Engineering Consultation:	_____ Hours	@ \$ _____ / Hour	= \$ _____
	ENGINEERING SUBTOTAL		\$ _____
			C.

TOTAL NOT-TO-EXCEED PRICE (A+B+C): \$ _____

QUALITY ASSURANCE TESTING AND INSPECTION SERVICES AND SAMPLE RFP

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INSTRUCTIONS TO PROFESSIONAL

1. QUALITY ASSURANCE SCOPE

- A. The Professional shall specify all testing and inspections and Special Inspections as required by the International Building Code (IBC). Primary testing and inspections are done by the Contractor's Quality Control (QC) Agent, and additional testing and inspections are to be done by the Quality Assurance (QA) Agent. Special Inspections are to be performed strictly in accordance with IBC requirements. Refer to Chapter 13 of the Project Procedure Manual. All tests and inspection hours are listed in a table in the RFP. The extent of these tests shall be approved by the Department in order to achieve some uniformity of testing and inspection requirements for all Projects. DGS has been granted several Special Inspections exceptions in a ruling from the Department of Labor and Industry (L&I) – see below:
- a. 2009 IBC 1704.2.2: DGS requires structural steel fabricators to be AISC Certified throughout the entire project duration. DGS does not require the structural steel erector to be AISC Certified. DGS understands section 1704.2.2 to mean if the structural steel fabricators are AISC Certified, Special Inspections of structural steel during the fabrication process is not required.
 - b. 2009 IBC Table 1704.3 Item 2c: DGS requires all pre-tensioned and slip critical joints in structural steel construction to have twist-off bolt or direct tension indicators. Based on this requirement for pre-tensioned and slip critical joints, DGS believes only periodic inspection of all pre-tensioned and slip critical joints in structural steel construction is therefore required (See Table 1704.3 Item 2b).
 - c. 2009 IBC Table 1704.3 Item 5a 1-4: Critical Welds (complete and partial joint penetration groove welds, multi-pass fillet welds, single-pass fillet welds > 5/16", and plug and slot welds) are required to be continuously inspected per Table 1704.3 Item 5a 1-4. DGS requires periodic testing of at least fifteen (15) percent of the critical welds by Liquid Penetrant, Magnetic Particle, Ultrasonic Contact or Radiographic Examination means. DGS believes this testing in lieu of continuously visual observation is a better indication of the welds performance. This weld testing would be the responsibility of DGS's Quality Assurance Agent.
 - d. 2009 IBC Table 1704.3 Item 5b 2-3: Welding of reinforcing steel in concrete construction resisting flexural and axial forces in intermediate and special moment frames, boundary elements of special structural walls of concrete and shear reinforcement, and shear reinforcing require continuous special inspection. DGS requires continuous inspections of this work and is required to be performed by DGS's Quality Assurance Agent.
 - e. 2009 IBC Table 1704.4 Item 3: DGS understands this requirement requires all bolts to be inspected prior to pouring concrete. DGS requires continuous inspection and testing by the Contractor's Independent Quality Control Agent, with periodic oversight by DGS's Quality Assurance Agent to verify all bolts to be inspected prior to pouring concrete.
 - f. 2009 IBC Table 1704.4 Item 6: DGS requires continuous testing and inspections by the Contractor's Independent Quality Control Agent, with periodic oversight by DGS's Quality Assurance Agent, to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete. The results from this concrete testing are to be

submitted to DGS's design Professional and the retained DGS Quality Assurance Agent for their review and approval.

- g. 2009 IBC Table 1704.4 Item 7: DGS requires continuous testing and inspections by the Contractor's Independent Quality Control Agent, with periodic oversight by DGS's Quality Assurance Agent, to inspect and approve concrete placement techniques by the concrete contractor. Shotcrete placement is required to be continuously inspected and DGS requires this work to be performed by the DGS Quality Assurance Agent.
- h. 2009 IBC Table 1704.4 Item 9: Inspection of prestressed concrete with application of prestressing forces and grouting of bonded prestressing tendons in the seismic-force-resisting system are required to be continuously inspected and DGS requires this work performed by the DGS Quality Assurance Agent.
- i. 2009 IBC Table 1704.5.1 Item 3 / Table 1704.5.3 Item 4: DGS requires continuous testing and inspections by the Contractor's Independent Quality Control Agent, with periodic oversight by DGS's Quality Assurance Agent, for verification of slump flow and VSI as delivered to the site for self-consolidating grout.
- j. 2009 IBC Table 1704.5.1 Item 5d / Table 1704.5.3 Item 5j: Welding of reinforcing steel in concrete construction is required to be continuous inspected and DGS requires this work performed by the DGS Quality Assurance Agent.
- k. 2009 IBC Table 1704.5.1 Item 5f, 7, & 7a & Table 1704.5.3 Item 5f, 5l: Prestressed concrete is required to be continuous inspected and DGS requires this work performed by the DGS Quality Assurance Agent.
- l. 2009 IBC Table 1704.5.3 Item 5d, 5e: DGS requires that the contractor mark in an approved manor the location of all steel reinforcing bars in fully grouted concrete masonry unit cells. This procedure allows for the DGS Quality Assurance Agent to verify at least twenty (20) percent of the grouted steel reinforcing locations with a steel reinforcing locating apparatus.
- m. 2009 IBC Table 1704.5.3 Item 5h: Continuous inspection of type, size, and location of anchors anchoring masonry to structural members is required. This work is intended to be performed by DGS's Quality Assurance Agent.
- n. 2009 IBC Table 1704.5.3 Item 6: DGS requires the Contractor's Independent Quality Control Agent, with periodic oversight by DGS's Quality Assurance Agent to fabricate grout specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.
- o. 2009 IBC Table 1704.7 Item 4: DGS requires continuous inspection and testing by the Contractor's Independent Quality Control Agent, with periodic oversight by DGS's Quality Assurance Agent to verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.
- p. 2009 IBC Table 1704.8 Items 1-4, Table 1704.9 Items 1-2, and Section 1704.10: Continuous inspection of driven deep foundation elements, cast-in-place concrete deep foundation elements, and helical pile foundations are required to be continuously inspected. DGS requires these structural elements to be continuously inspected by DGS's Quality Assurance Agent.
- q. 2009 IBC Section 1704.6.1: Special Inspections of High-load diaphragms are required to have their grade, thickness, and fastening verified to be installed in accordance with the approved building plans. DGS requires this work to be performed by DGS's Quality Assurance Agent.
- r. 2009 IBC Section 1704.3.4 / 1704.6.2: Special Inspection of Cold-formed steel and metal-plate-connected wood trusses spanning greater than 60 feet or more are required to have their temporary and permanent bracing verified to be installed in accordance with the approved truss submittal. DGS requires this work to be performed by DGS's Quality Assurance Agent.

2. **RESPONSIBILITIES**

- A. The agreement between the Quality Assurance Agency and the Professional is to include the furnishing of all means required to insure that tests and inspections as described therein shall be performed in accordance with the specifications and to the complete satisfaction of the Professional, the Department, and the Uniform Construction Code (UCC), including requirements in Chapter 17 – Structural Tests and Special Inspections – of the IBC.
- B. With the aid of its consultants, the Professional shall establish need for and the quantities of all tests and inspections hours and shall write the detailed RFP following the guidelines in the sample RFP. Each test method must be identified by ASTM number and title or other similar designation as applicable. Testing required shall be as necessary to assure Professional will execute the UCC *Special Inspections and Observation Statement* form at the completion of the project.

3. **DESIGN**

- A. DGS terminology in Section 014000 Quality Control Testing Services and Section 014010 Quality Assurance Testing and Inspection Services of the Division 1 – General Requirements shall be adopted by the Professional and used throughout the Project Manual.
- B. When the Professional requires Quality Assurance Testing in any specification section, it shall so state in the technical specification and refer to Division 1 Section 014010 for the specific tests to be performed. The Professional shall list tests to be taken in Paragraph 3.4 of Section 014010. Inspections shall also be listed as a single item for each trade, referring to the Chapter 17 Paragraph and/or Table requiring the inspections for the specific inspections required. Quantities of tests are not to be listed in Division 1 Section 014010.
- C. The Construction Documents Submission for each project shall reflect the Professional's and the consultants' considered recommendations on Quality Assurance and Quality Control Services in the Contract Documents.
- D. At the Construction Documents Submission the Professional shall submit a draft of the RFP for Quality Assurance Services. The RFP shall contain quantities of all items and should reflect the Professional's assessment of what is required to execute the UCC *Special Inspections and Observation Statement* form at the completion of the project. The RFP is to include the detailed descriptions of inspections listed in Chapter 17 or the IBC plus estimated hours, etc. as shown on the attached sample proposal. The Professional is to determine testing and inspection requirements for the specific project, deleting N/A items and adding items he deems necessary. Note that the sample proposal includes all Special Inspection requirements listed in Chapter 17 for concrete, masonry and steel, including both Level 1 and Level 2 masonry inspections. A copy of the draft RFP shall be submitted with the Contract Document submission in e-Builder for review and approval. The RFP shall include the Invitation, Cover Sheet, and Specification for Quality Assurance Testing and Inspection and Proposal. Comments will be provided to the Professional as part of the submission review in e-Builder for correction of the RFP and its subsequent use in obtaining quotations.
- E. The Professional shall fill out and submit with the building permit application the UCC *Special Inspections and Observations Statement* form, leaving out the names of the Agents who will be performing the tests. When the agents are under contract, the Professional is to resubmit the form including the required names to L&I.

4. **PROPOSALS**

- A. The Professional must send out the RFP at the time the Project is placed for construction contract bidding. The Professional shall allow a period of not more than thirty (30) days for submission. It is imperative that a Quality Assurance Agency be under contract at the Initial Job Conference.
- B. The Professional shall obtain proposals from at least three (3) full-service testing laboratories for Quality Assurance Services and shall submit the same to the Bureau of Pre-Construction (BOPC) with a recommendation for award. Professional shall solicit quotations from Quality Assurance

Agencies having the qualifications to perform all inspections, laboratory and field-testing in house except for certain uncommon tests/inspections noted to be subcontracted. All inspectors shall be trained and certified by UCC for the inspections they are performing.

- C. The Testing Laboratory/QA Agent shall assign personnel and equipment to meet the requirements stipulated in ASTM E-329. The testing laboratory must be accredited and audited by a qualified national Authority. The Professional must submit to the BOPC with the submission of Bid Proposals the following statement: "We hereby certify all laboratories are properly equipped and staffed in accordance with ASTM E-329."

5. THE CONTRACT

- A. Upon receipt of the results of the Professional's Quality Assurance Services solicitations and its recommendations, the BOPC shall initiate a Work Order to the Professional for the Quality Assurance services. Contact the low General Construction Contract (.1) bidder, so as not to be recommending for QA Agent the same firm as the expected QC Agent.
- B. The Quality Assurance Agency Contract shall not be awarded before prime construction contracts are awarded. At the time of awarding the Quality Assurance Services Contract, the Professional must furnish to the Quality Assurance Agency all project specifications involving Quality Assurance Services. The Professional shall also provide copies of applicable portions of testing and inspection standards, which apply, to the Project to the BOPC.

6. SUBMISSION OF REPORTS

- A. The Quality Assurance Agency shall provide one (1) copy of each written test report to the Professional who will upload the results to e-Builder as soon as the test results are available for the review of the parties listed below. If the report is field generated, the Quality Assurance Agency' field Supervisor's report is to be delivered to the field office first and then a copy provided to the Professional for uploading to e-Builder. The Quality Assurance Agent shall also distribute copies of all reports immediately after completion to the agreed upon representatives of UCC.

The Professional
 Bureau of Capital Project Construction Regional Director
 Bureau of Capital Project Construction Project Manager
 Bureau of Capital Project Construction Assistant Project Manager
 Quality Control Agent
 The Contractor

- B. Any tests that indicate that material does not meet contract requirements shall be immediately brought to the attention of the Bureau of Construction (BOC) Project Manager (PM) and/or Assistant Project Manager (APM) by telephone and confirmed later in writing. The BOC PM and/or APM shall notify the Contractor immediately. The Quality Assurance Agency shall cooperate fully with the Professional and the Department in correcting all such conditions.
- C. Approved samples that are to be incorporated in the Project shall be returned to the job site by the Quality Assurance Agency. Rejected samples may be reclaimed from the Quality Assurance Agency by the Contractor.

7. CHANGES

- A. The List of Tests in the Quality Assurance Testing Contract establishes a limit on the dollar amount of tests that may be taken. Quantities of tests and inspection hours taken are to be adjusted up or down, as appropriate. When the QA Services contract needs to be increased, the Professional shall make a written request to the Department for a specific amount, with an explanation of why this is necessary, and how the amount was determined.
- B. The Professional must secure a unit price from the Quality Assurance Agency, for approval by the Department, for any tests or services not specifically noted in the Contract.

8. ADMINISTRATION

- A. During construction the Quality Assurance Agent shall review testing and inspection reports of the Quality Control Agent, confirm that proper testing procedures and frequencies occur, and report concerns to the Professional and the Department. The Professional and the BOC shall jointly decide what tests and inspections shall be performed by the Quality Assurance Agent to confirm the Quality Control Agent findings and Contractor compliance.
- B. The Quality Assurance Agency is not to be delegated the authority to determine when tests or inspections are to occur.

9. QUALITY ASSURANCE AGENCY PERFORMANCE

- A. If the Professional finds the Quality Assurance Agency to be deficient in any respect, the Professional shall notify the BOC PM and/or APM, in writing, with copy to the Director of the BOC.

10. BILLINGS

- A. The Professional is entitled to a coordination/administration fee of not more than 10% of the cost of the Quality Assurance Services.

SAMPLE REQUEST FOR PROPOSAL
[on Professional's Letterhead]

Date: _____

To: _____

Re: **REQUEST FOR PROPOSAL FOR QUALITY ASSURANCE SERVICES**

Project Number: _____ Phase: _____ Proposal Due Date: _____

Project Title: _____

Location: _____ Client Agency: _____

Quality Assurance Agent:

Thank you for your interest in submitting a proposal on Quality Assurance Services for the above referenced project for the Commonwealth of Pennsylvania and for which we are the Professional. Enclosed are the following documents:

- Specifications for Quality Assurance Testing and Inspections
- Sample Proposal Form

You, the Quality Assurance Agent, are to provide testing and inspection at unit prices quoted in your proposal.

Please submit your Proposal by _____ ***[insert date]***.

Very truly yours,

[PROFESSIONAL]

SPECIFICATIONS FOR QUALITY ASSURANCE TESTING AND INSPECTIONS

CONTENTS	PAGE
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i. GENERAL

- A. The Quality Assurance Agency shall perform services authorized by Work Order, or approved by the Professional and the Department. The Quality Assurance Agency shall be available on the project within 24 hours after notification for performance of any tests on the List of Tests on the Proposal Form. Notification on inspections required shall be on a day-to-day basis. The Quality Assurance Agency shall provide testing services for tests listed in the Proposal Form and may subcontract those tests that it is not qualified to perform. The Quality Assurance Agency shall perform concrete, masonry and steel bolt tightening tests and inspections with its own personnel.
- B. The Quality Assurance Agency is to include the furnishing of all means required to insure that tests in the proposal shall be performed in accordance with the specifications, the test requirements, and to the complete satisfaction of the Professional and the Department.
- C. The Quality Assurance Agency shall be properly equipped and staffed in accordance with requirements of ASTM E-329.
- D. The Quality Assurance Agency shall cooperate with the Professional in providing documentation and support as required to comply with Uniform Construction Code (UCC) requirements and shall comply with DGS Construction's documentation requirements and Administration Procedures.
- E. The Quality Assurance Agent shall log in and out at the site, and shall provide documentation and reports as required by the Bureau of Construction (BOC).

ii. REPORTS AND DISTRIBUTION

- A. The Quality Assurance Agency shall provide one (1) copy of each written test report to the Professional who will upload the results to e-Builder as soon as the test results are available for the review of the parties listed below. If the report is field generated, the Quality Assurance Agency's field Supervisor's report is to be delivered to the field office first and then a copy provided to the Professional for uploading to e-Builder. The Quality Assurance Agent shall also distribute copies of all reports immediately after completion to the agreed upon representatives of UCC. Any tests that indicate that material does not meet contract requirements shall immediately be brought to the attention of the BOC Project Manager (PM) and/or Assistant Project Manager (APM) by telephone and confirmed in writing. The Department will notify the Contractor. The Quality Assurance Agency shall cooperate fully with the Professional and the DGS in correcting all such conditions.

The Professional
 Bureau of Capital Project Construction Regional Director
 Bureau of Capital Project Construction Project Manager
 Bureau of Capital Project Construction Assistant Project Manager
 Quality Control Agent
 The Contractor

iii. SAMPLES

- A. Approved samples that are to be incorporated in the building shall be returned to the job site by the Quality Assurance Agency. Rejected samples may be reclaimed at the Quality Assurance Agency by the Contractor.

iv. BILLINGS

- A. The Quality Assurance Agency shall comply with documentation requirements established by the Bureau of Construction (BOC) for their verification of the accuracy of all charges (hours on site, number of tests, etc.). The Quality Assurance Agency shall submit their monthly billing to the Professional for processing. The Professional will submit its invoice (which will include the Quality Assurance Agency charges) to the BOC through an e-Builder process for confirmation of field effort (hours on site, number of tests, etc.). Charges that might be back charged to the Contractor shall also be identified.

v. CHANGES/QUANTITIES

- A. The List of Tests, hours and tasks in the attached Proposal establishes a limit on the dollar amount of tests that may be taken. Tests and inspections shall be ordered by the Professional in collaboration with the Bureau of Construction (BOC). Quantities of all items may be adjusted as appropriate and authorized, providing the total dollar amount is not exceeded. The Quality Assurance Agency is to provide ample notification when funds are near exhaustion. Tests not quoted in the Proposal must be negotiated prior to providing.

vi. INSURANCE

- A. The Quality Assurance Agency shall maintain Worker's Compensation Insurance and such other insurance as will protect it, the Professional and the Department from claims for damages arising from the Quality Assurance Agency's operations under this Contract. The Quality Assurance Agency's Liability and Contingent Liability Insurance shall be an occurrence-based policy in the amounts of \$250,000 for property damage and \$1,000,000 for personal injury. The Commonwealth shall be named as an additional insured, which shall be noted on the certificate of insurance, with all coverage descriptions. The Commonwealth shall receive no less than 30 days' notice of cancellation. Certificates of insurance shall be submitted to the Professional in duplicate.

vii. JOB CONFERENCES

- A. A representative of the Quality Assurance Agency shall attend the Initial Job Conference at no additional cost. Attendance at subsequent Job Conferences shall be reimbursable at the Inspection Hourly Rate quoted.

viii. PROJECT SPECIFICATIONS

- A. The Quality Assurance Agency shall comply with applicable requirements of Specifications for work tested and Section 014010 Quality Assurance Testing And Inspection Services. Tests listed in Section 014010 are the basis for the Contractor's inclusion of his costs in connection with Quality Assurance Testing. The Quality Assurance Agency is bound to the List of Tests and Inspection items in his Proposal.

ix. PHOTOGRAPHS

- A. Inspectors shall be equipped with a digital camera that automatically records the date and time the photograph was taken. Photographs shall be taken of construction deficiencies or when it is easier to

photograph than describe. Photographs shall be provided to the Professional for uploading to e-Builder. When needed, hard copies of photographs will be made by DGS from the electronic files provided by the QA Agent. Daily reports shall refer to photos taken as necessary for report clarity.

SAMPLE PROPOSAL FORM
[on Quality Assurance Agency's Letterhead]

Date: _____

To: [Professional] _____

Proposer: [Quality Assurance Agency] _____

Re: **PROPOSAL FOR QUALITY ASSURANCE SERVICES**

Project Number: _____ Phase: _____ Proposal Due Date: _____

Project Title: _____

Location: _____ Client Agency: _____

Professional:

We propose to perform the testing or inspections listed in the following schedule for the prices as listed below in accordance with your RFP dated _____ for the not-to-exceed amount of \$_____.

All tests will be performed by the personnel of the Quality Assurance Agency except for the following:

We hereby certify all laboratories are properly equipped and staffed in accordance with ASTM E-329.

Proposer:

Quality Assurance Agency Signature

Date

Quality Assurance Agency Printed Name

Title

LIST OF TESTS AND INSPECTIONS

<u>REQ'D BY³</u>	<u>DESCRIPTION OF TEST OR INSPECTION</u>	<u>C, P, OR A⁴</u>	<u>REFERENCED STANDARD</u>	<u>IBC REFER-ENCE⁵</u>	<u>NO. OF TESTS /HOURS</u>	<u>UNIT PRICE¹</u>	<u>TOTAL</u>
	BITUMINOUS PAVING						
DGS	Field inspection of construction procedures				Hrs	\$	\$
DGS	Bulk Specific Gravity...of Compacted Bituminous Mixtures...		ASTM D1188 or D 2726		Ea	\$	\$
DGS	Density of Bituminous Concrete in Place by Nuclear Method		ASTM D 2950		Hrs	\$	\$
DGS	Thickness or Height of Compacted Bituminous Paving Mixture Specimens		ASTM D 3549		Ea	\$	\$
	CONCRETE						
IBC	1. Inspection of reinforcing steel, including prestressing tendons, and placement	P	ACI 318: 3.5, 7.1-7.7	1913.4	Hrs	\$	\$
IBC	2. Inspection of reinforcing steel welding, in accordance with Table 1704.3, Item 5b		AWS D1.4; ACI 318: 3.5.2		-	\$	-
IBC	3. Inspection of bolts to be installed in concrete prior to and during placement of concrete, where allowable loads have been increased or where strength design is used	A	ACI 318: 8.1.3, 21.2.8	1911.5 1912.1	Hrs	\$	\$
IBC	4. Inspection of anchors installed in hardened concrete	P	ACI 318: 3.8.6, 8.1.3, 21.2.8	1912.1		\$	
IBC	5. Verifying use of required design mix	P	ACI 318: Ch. 4, 5.2-5.4	1904.22, 1913.2, 1913.3	Hrs	\$	\$
IBC	6. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, determine the temperature of the concrete	P A	ASTM C172, C31; ACI 318: 5.6, 5.8		Hrs	\$	\$
IBC	7. Inspection of concrete and shotcrete placement for proper application techniques	P A	ACI 318: 5.9, 5.10	1913.6, 1913.7, 1913.8	Hrs	\$	\$
IBC	8. Inspection for maintenance of specified curing temperature and techniques	P	ACI 318; 5.11-5.13	1913.9	Hrs	\$	\$
IBC	9. Inspection of prestressed concrete: a. Application of prestressing forces b. Grouting of bonded prestressing tendons in the seismic-force-resisting system	C C	ACI 318: 18.20 ACI 318: 8.18.4		Hrs	\$	\$

<u>REQ'D BY³</u>	<u>DESCRIPTION OF TEST OR INSPECTION</u>	<u>C, P, OR A⁴</u>	<u>REFERENCED STANDARD</u>	<u>IBC REFER-ENCE⁵</u>	<u>NO. OF TESTS /HOURS</u>	<u>UNIT PRICE¹</u>	<u>TOTAL</u>
IBC	10. Erection of precast concrete members	P	ACI 318: Ch.16		Hrs	\$	\$
IBC	11. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	P	ACI 318: 6.2		Hrs	\$	\$
IBC	12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	P	ACI 318: 6.1.1		Hrs	\$	\$
DGS	Review Contractors' design mixes, Certificates of Compliance and material test reports				Lump Sum	\$	\$
DGS	Compressive Strength of Cylindrical Concrete Specimens ²		ASTM C39		Ea	\$	\$
	CAST STONE						
DGS	Absorption of Architectural Cast Stone		ASTM C1195		Ea	\$	\$
	MASONRY						
DGS	Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry, Annex A7 Compressive Strength ²		ASTM C780		Ea	\$	\$
DGS	Method of Sampling and Testing Grout ²		ASTM C1019		Ea	\$	\$
	Level 1 Special Inspection						
IBC	1. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.	P	Art. 1.5 ⁷		Hrs	\$	\$
IBC	2. Verification of f'_m and f'_{AAC} prior to construction except where specifically exempted by this code.	P	Art. 1.4B ⁷		Hrs	\$	\$
IBC	3. Verification of slump flow and VSI as delivered to the site for self-consolidating grout.	C	Art. 1.5B.1.b.3 ⁷		Hrs	\$	\$
IBC	4. As masonry construction begins, the following shall be verified to ensure compliance: a. Proportions of site-prepared mortar b. Construction of mortar joint c. Location of reinforcement connectors, prestressing tendons and anchorages d. Prestressing technique e. Grade and size of prestressing tendons and anchorages	P P P P P	Art 2.6A ⁷ Art 3.3B ⁷ Art 3.4, 3.6A ⁷ Art 3.6B ⁷ Art 2.4B, 2.4H ⁷		Hrs	\$	\$

<u>REQ'D BY³</u>	<u>DESCRIPTION OF TEST OR INSPECTION</u>	<u>C, P, OR A⁴</u>	<u>REFERENCED STANDARD</u>	<u>IBC REFER- ENCE⁵</u>	<u>NO. OF TESTS /HOURS</u>	<u>UNIT PRICE¹</u>	<u>TOTAL</u>
IBC	5. The inspection program shall verify: a. Size and location of structural elements b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction. c. Specified size, grade and type of reinforcement, anchor bolts, prestressing tendons and anchorages. d. Welding of reinforcing bars e. Preparation, construction and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F) f. Application and measurement of prestressing force	P P P C P C	Art 3.3F ⁷ Sec 1.2.2(e) ⁶ , 1.16.1 ⁶ Sec 1.15 ⁶ , Art 2.4, 3.4 ⁷ Sec 2.1.9.7.2, 3.3.3.4(b) ⁶ Art 1.8C, 1.8D ⁷ Art 3.6B ⁷	Sec 2104.3, 2104.4	Hrs	\$	\$
IBC	6. Prior to grouting, the following shall be verified to ensure compliance: a. Grout space is clean b. Placement of reinforcement and connectors and prestressing tendons and anchorages c. Proportions of site-prepared grout and prestressing grout for bonded tendons d. Construction of mortar joints	P P P P	Art 3.2D ⁷ Sec 1.13 ⁶ , Art 3.4 ⁷ Art 2.6B ⁷ Art 3.3B ⁷		Hrs	\$	\$
IBC	7. Grout placement shall be verified to ensure compliance with code and construction document provisions a. Grouting of prestressing bonded tendons	C C	Art 3.5 ⁷ Art 3.6C ⁷		Hrs	\$	\$
IBC	8. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed	C	Art 1.4 ⁷	Sec 2105.2.2, 2105.3	Hrs	\$	\$
	Level 2 Special Inspection						
IBC	1. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified	P	Art 1.5 ⁷		Hrs	\$	\$
IBC	2. Verification of f'_m and f'_{AAC} prior to construction and for every 5000 square feet during construction	P	Art. 1.4B ⁷		Hrs	\$	\$
IBC	3. Verification of proportions of materials in premixed or preblended mortar and grout as delivered to the site	P	Art. 1.5B ⁷		Hrs	\$	\$
IBC	4. Verification of slump flow and VSI as delivered to the site for self-consolidating grout	C	Art. 1.5B.1.b.3 ⁷		Hrs	\$	\$

<u>REQ'D BY³</u>	<u>DESCRIPTION OF TEST OR INSPECTION</u>	<u>C, P, OR A⁴</u>	<u>REFERENCED STANDARD</u>	<u>IBC REFER-ENCE⁵</u>	<u>NO. OF TESTS /HOURS</u>	<u>UNIT PRICE¹</u>	<u>TOTAL</u>
IBC	5. The following shall be verified to ensure compliance: a. Proportions of site-prepared mortar, grout and prestressing grout for bonded tendons b. Placement of masonry units and construction of mortar joints c. Placement of reinforcement, connectors and prestressing tendons and anchorages d. Grout space prior to grouting e. Placement of grout f. Placement of Prestressing grout g. Size and location of structural elements. h. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction. i. Specified size, grade and type of reinforcement, anchor bolts, prestressing tendons and anchorages. j. Welding of reinforcing bars. k. Preparation, construction and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F). l. Application and measurement of prestressing force.	P P P A A C P C P C	Art 2.6A ⁷ Art 3.3B ⁷ Sec 1.15 ⁶ , Art 3.4, 3.6A ⁷ Art 3.2D ⁷ Art 3.5 ⁷ Art 3.6C ⁷ Art 3.3F ⁷ Sec.1.2.2(e), 1.16.1 ⁶ Sec. 1.15 ⁶ Art. 2.4, 3.4 ⁷ Sec. 2.1.9.7.2, 3.3.3.4 (b) ⁶ Art. 1.8C, 1.8 ⁷ Art. 3.6B ⁷	2104.3, 2104.4	Hrs	\$	\$
IBC	6. Preparation of any required grout specimens and/or prisms shall be observed	A	Art 1.4 ⁷	2105.2.2 2105.3	Hrs	\$	\$
STEEL CONSTRUCTION							
IBC	1. Material verification of high-strength bolts, nuts, and washers: a. Identification markings to conform to ASTM standards spec in the approved CDs. b. Manufacturer's Certificate of Compliance required	P P	AISC 360, Section A3.3 and applicable ASTM material standards		Hrs	\$	\$
IBC	2. Inspection of high-strength bolting: a. Snug-tight joints b. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt or direct tension indicator methods of installation. c. Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation (N/A; DGS requires twist-off bolt or direct tension indicator)	P P N/A	AISC 360, Section M2.5	1704.3.3	Hrs	\$	\$

<u>REQ'D BY³</u>	<u>DESCRIPTION OF TEST OR INSPECTION</u>	<u>C, P, OR A⁴</u>	<u>REFERENCED STANDARD</u>	<u>IBC REFER- ENCE⁵</u>	<u>NO. OF TESTS /HOURS</u>	<u>UNIT PRICE¹</u>	<u>TOTAL</u>
IBC	3. Material verification of structural steel and cold-formed steel deck: a. For structural steel, identification markings to conform to AISC 360 b. For other steel, identification markings to conform to ASTM standards specified in the approved CDs c. Manufacturer certified test reports	P P P	AISC 360, Section M5.5 Applicable ASTM material standards		Hrs	\$	\$
IBC	4. Material verification of weld filler materials: a. Identification markings to conform to AWS specification in the appr CDs b. Manufacturer's Certificate of Compliance required	P P	AISC 360, Sect A3.5 and applicable AWS A5 documents		Hrs	\$	\$
IBC	5. Inspection of welding: a. Structural steel 1) Complete and partial penetration groove welds 2) Multi-Pass fillet welds 3) Single-pass fillet welds > 5/16" 4) Plug and slot welds 5) Single-pass fillet welds < 5/16" 6) Floor and deck welds b. Reinforcing steel: 1) Verification of weldability of reinforcing steel other than ASTM A 706 2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls, and shear reinforcement 3) Shear reinforcement 4) Other reinforcing steel	A A A A P P P C C P	AWS D1.1 AWS D1.3 AWS D1.4 ACI 318: Section 3.5.2	1704.3.1 1704.3.1	Hrs	\$	\$
IBC	6. Inspection of steel frame joint details for compliance with approved CDs: a. Details such as bracing and stiffening b. Member locations c. Application of joint details at each connection	P P P		1704.3.2	Hrs	\$	\$
DGS	Liquid Penetrant Examination		ASTM E165		Ea	\$	\$
DGS	Guide for Magnetic Particle Examination		ASTM E709		Ea	\$	\$
DGS	Practice for Ultrasonic Contact Examination of Weldments		ASTM E164		Ea	\$	\$
DGS	Guide for Radiographic Examination		ASTM E94		Ea	\$	\$

<u>REQ'D BY³</u>	<u>DESCRIPTION OF TEST OR INSPECTION</u>	<u>C, P, OR A⁴</u>	<u>REFERENCED STANDARD</u>	<u>IBC REFER- ENCE⁵</u>	<u>NO. OF TESTS /HOURS</u>	<u>UNIT PRICE¹</u>	<u>TOTAL</u>
	COLD-FORMED STEEL TRUSSES						
IBC	Cold-formed steel trusses spanning 60 feet or greater			1704.3.4	Hrs	\$	\$
	WOOD						
IBC	Professional to determine requirements.			1704.2 1704.6	Hrs	\$	\$
	DRIVEN DEEP FOUNDATIONS						
IBC	1. Verify element materials, sizes and lengths comply with the requirements.	C		1704.8	Hrs	\$	\$
IBC	2. Determine capacities of test elements and conduct additional load tests, as required.	C		1704.8	Hrs	\$	\$
IBC	3. Observe driving operations and maintain complete and accurate records for each element.	C		1704.8	Hrs	\$	\$
IBC	4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element.	C		1704.8	Hrs	\$	\$
IBC	5. For steel elements, perform additional inspections in accordance with Section 1704.3.			1704.8			
IBC	6. For concrete elements and concrete-filled elements, perform additional inspections in accordance with Section 1704.4.			1704.8			
IBC	7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge.			1704.8	Hrs	\$	\$
	CAST-IN-PLACE DEEP FOUNDATION ELEMENTS						
IBC	1. Observe drilling operations and maintain complete and accurate records for each element.	C		1704.9	Hrs	\$	\$
IBC	2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes.	C		1704.9	Hrs	\$	\$

<u>REQ'D BY³</u>	<u>DESCRIPTION OF TEST OR INSPECTION</u>	<u>C. P. OR A⁴</u>	<u>REFERENCED STANDARD</u>	<u>IBC REFER-ENCE⁵</u>	<u>NO. OF TESTS /HOURS</u>	<u>UNIT PRICE¹</u>	<u>TOTAL</u>
IBC	3. For concrete elements, perform additional inspections in accordance with Section 1704.4.			1704.9			
	HELICAL PILE FOUNDATIONS						
IBC	Professional to determine requirements.			1704.10	Hrs	\$	\$
	VERTICAL MASONRY FOUNDATION ELEMENTS						
IBC	Professional to determine requirements.			1704.11			
	SPRAYED FIRE-RESISTANT MATERIALS						
IBC	Professional to determine requirements.			1704.12	Hrs	\$	\$
	MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS						
IBC	Professional to determine requirements.		AWCI 12-B.	1704.13	Hrs	\$	\$
	EXTERIOR INSULATION AND FINISH SYSTEMS						
IBC	Professional to determine requirements.			1704.14	Hrs	\$	\$
	SEISMIC RESISTANCE						
IBC	Professional to determine requirements.			1705 1707 1708	Hrs	\$	\$
	WIND REQUIREMENTS						
IBC	Professional to determine requirements.			1706	Hrs	\$	\$
	General Overview of QC testing						
DGS	Review of Contractor QC Testing and Reports				Hrs	\$	\$

TOTAL PRICE WITHOUT SOILS \$ _____

<u>REQ'D BY</u> ³	<u>DESCRIPTION OF TEST OR INSPECTION</u>	<u>C, P, OR A</u> ⁴	<u>REFERENCED STANDARD</u>	<u>IBC REFER-ENCE</u> ⁵	<u>NO. OF TESTS /HOURS</u>	<u>UNIT PRICE</u> ¹	<u>TOTAL</u>
	SOILS ⁸						
IBC	1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity	P		1704.7	Hrs	\$	\$
IBC	2. Verify excavations are extended to proper depth and have reached proper material	P		1704.7	Hrs	\$	\$
IBC	3a. Perform testing of compacted fill materials	P		1704.7	Hrs	\$	\$
	3b. Perform classification of proposed compacted fill	P		1704.7	Ea.	\$	\$
	3c. Perform Proctor testing of proposed compacted fill	P		1704.7	Ea.	\$	\$
IBC	4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill	A		1704.7	Hrs	\$	\$
IBC	5. Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly	P		1704.7	Hrs	\$	\$

TOTAL PRICE – SOILS \$ _____

Footnotes:

- All unit prices quoted must include all travel costs and expenses, generation of hand-written field reports and equipment costs for the tests (including nuclear density gauge), clerical support, copies, and postage. Payment will only be made for actual hours on site with a four (4) hour minimum. Payment will not be made for travel time. The method of keeping track of hours on site shall be approved by the Department. The time required by the Professional Engineer in Charge time to supervise and schedule on site monitoring and testing is also to be included in these rates. Sample pick-up and transportation charges must be included in the laboratory test prices.
- Concrete, mortar or grout molds are to be made by QA Agent under Special Inspection hours.
- "DGS" are tests required by DGS and "IBC" are test required by Chapter 17 of the 2009 International Building Code.
- "C" indicates continuous inspection. "P" indicates periodic inspection. "A" indicates inspect all items per L&I Special Inspections exemptions.
- IBC 2009.
- Refers to reference ACI 530/ASCE 5/TMS 402
- Refers to reference ACI 530.1/ASCE 6/TMS 602
- Quality Assurance for soils shall be performed/provided by the Professional's Foundation Consultant/Geotechnical Engineer under a separate Work Order issued by the Department to the Professional.

**INSTRUCTIONS FOR
LAND (BOUNDARY AND/OR TOPOGRAPHIC) SURVEY AND SAMPLE RFP**

Project Number: _____ Phase: _____ Proposal Due Date: _____

Project Title: _____

Location: _____ Client Agency: _____

SCOPE OF SURVEY SERVICES

1. GENERAL

- a. The Surveyor is responsible for obtaining all sufficient documentation and evidence to produce a topographic survey plan, which is correct, as well as accurate, to the given specifications and standards. The limits of the Project Site and area to be surveyed are shown on the attached maps.
- b. It shall be the Surveyor’s responsibility to notify, within a reasonable amount of time before starting work, the property owners and any adjacent owners upon whose land it may be necessary to enter in order to complete the survey.
- c. The Surveyor shall take all reasonable precautions to prevent damage to the Project Site and adjacent properties, visible and concealed, and shall reasonably restore the site to the condition existing prior to the Surveyor’s entry, including but not limited to, repair of lawns and plantings.
- d. The Project Title indicated above is the site of the Project and is hereinafter referred to as the “Project Site”. The contact at the Project Site is:

Name: _____

Title: _____

Telephone Number: _____

Email Address: _____

2. SURVEY STANDARDS

- A. All survey work shall be done or supervised by a professional Surveyor licensed by law to practice in the Commonwealth of Pennsylvania. Such license shall be current and valid.
- B. Survey shall have a complete title describing the scale of the drawing and dates surveyed and plotted including revision dates. The location of the site shall be described geographically. All work shall be certified by seal, signature and date by the Professional Surveyor.
- C. Surveyor shall do all work required to determine accurately the physical conditions on and adjacent to the site. Limits of Survey shall extend to limits indicated on attached site map.
- D. Horizontal Datum shall be tied to USGS or NAD83 or another approved datum.
 - 1) Identify survey north on the plans.
 - 2) The horizontal control to establish ties to the coordinate system shall be shown and described on the survey.
- E. Vertical Datum shall be tied to USGS or NAVD88 or another approved datum.
 - 1) The benchmarks used to establish ties to the datum shall be shown and described on the plan.

- 2) The horizontal control to establish ties to the coordinate system shall be shown and described on the survey.

3. **REQUIREMENTS**

- a. Boundary Survey:
 - All bearings and distance (metes and bounds), easements, right-of-way, building restrictions, survey traverse lines, streets, alleys, lanes, roads, railroads, etc. on or adjacent to the site shall be shown, dimensioned and clearly referenced. If applicable, relate property lines to buildings and monuments.
 - All property markers (iron pin, concrete monument, etc.) found or set during the Surveyor's work shall be shown and described on the plan.
 - Show recorded or otherwise known easements and rights-of-way, and identify the owners (holders).
 - Give names of owners of properties adjacent to the Project Site area.
- b. Paving:
 - 1) Extent of existing roads, berms, walks, streets, and alleys shall be shown.
 - 2) Pavement surface materials shall be described.
 - 3) Curb-to-curb dimensions and dedicated cartway widths of public roads shall be noted.
- c. Surface Features:
 - 1) Location and width of all existing streets, right-of-way, parking areas, and easements.
 - 2) Retaining walls, steps, sidewalks, etc. shall be surveyed.
 - 3) Location of visible rock formations.
- d. Structures:
 - 1) All structures, including buildings, foundations, piers, culverts, wells, tanks, towers, walls, fences, etc., shall be shown and dimensioned along with their size, shape, top and bottom grade elevations and type of construction. Relationship to or between adjacent structures shall be dimensioned.
 - 2) Where the new building construction will be adjacent to the existing building, obtain exact bearing and dimensioning of the existing building walls and floor/foundation elevations.
- e. Streams, Water Bodies and Wetlands:
 - 1) If applicable, drains, swales, spillways and drainage ditches shall be shown and described.
 - 2) If applicable, location and elevation of the 100-year floodplain.
- f. Utilities:
 - 1) Information for all on-site utilities, above and underground, shall be supplied in accordance with Act 38 of 1991, Commonwealth of Pennsylvania as amended.
 - 2) The Surveyor shall comply with Act 187 of 1996 provisions, as amended.
 - 3) Survey shall note an applicable Pennsylvania One-Call System Serial Number and Utility Listing.
 - 4) Show and describe location, sizes, direction of flow, gradients, surface and invert elevations of all existing storm sewer on or contiguous to the site, including catch basins, culverts, detention/retention ponds, etc.
 - 5) Show and describe location, sizes, direction of flow, gradients, surface and invert elevations of all existing sanitary sewer on or contiguous to the site.
 - 6) Show and describe location, type and size of all water, gas, steam and/or oil lines or mains, manholes, valves and/or meter boxes, hydrants, etc.
 - 7) Show and describe location electric and telephone lines, transformer stations, cable, fiber optic lines, etc.
 - 8) Show all utility poles and label pole numbers

- 9) For utilities not traversing the site, indicate if possible the nearest off-site utility leads (gas, storm and sanitary sewer, water, gas, steam, cable, fiber optic, telephone and electricity) give all pertinent data as to ownership, types, sizes, inverts.
- g. Wooded Areas:
 - 1) The limit of wooded areas or trees in small groups, including brush and shrub growth, shall be shown in its relative location.
 - 2) All single trees with a trunk diameter at breast height over six inches shall be shown, naming the type of tree and approximate trunk diameter.
- h. Core Boring and Mines:
 - 1) The location of any core borings, test holes and/or utility test pits in the survey area shall be shown.
- i. Elevations:
 - 1) Elevations shall be shown at all breaks in grade, whether vertical (walls or sloping (terraces).
 - 2) Spot elevations shall be given on foundation walls, first floors of building, walks, top and bottom of curbs, center lines and gutter lines of roads and streets, finished grades at corners of existing buildings, areaways, paved or play areas and all entrances of existing buildings.
 - 3) All contour and spot elevations shall meet NSPS standards for vertical positional and horizontal positional accuracy as follows:

	Vertical Positional Accuracy Feet	Horizontal Positional Accuracy Feet
Contour line 1' interval	± 0.65 ft	± 1 ft
Contour line 5' interval	± 3.20 ft	± 4 ft
Floor elevations	± 0.05 ft	± 1 ft
Spot paving elevations	± 0.05 ft	± 1 ft
Spot ground elevations	± 0.20 ft	± 2 ft
Sewer invert elevations	± 0.05 ft	± 1 ft
Well defined planimetric features	± 0.10 ft	± 1 ft

Positional Accuracy is given at the 95 percent confidence level.

- 4) In addition to spot elevations, plan shall show contours at one-foot (1-ft) intervals, unless the slopes are greater than 20% in which case a five-foot interval is required; or special concession has been granted by the Department to change the interval.
- 5) Elevations along centerlines of streets or roads and along curbs (top and bottom) shall be taken on a 20'-0" interval (10'-0" at intersections). Breaks or changes in grade or direction shall also be marked. When a slope is continuous and free from abrupt breaks or changes, the grid interval may be increased to 100'-0".

4. DELIVERABLES

- a. Surveyor shall provide a survey map in PDF format that incorporates all physical data secured during this survey. The map shall bear a certification, with seal and signature, by a registered Professional Land Surveyor, to the effect that the survey and map are correct. Map shall be accurate and to scale; and all data shown thereon shall be plotted in its correct relative position. Unless otherwise noted, the map scale shall be 1"=20'-0" and include a legend of plan symbols.
- b. Surveyor shall provide a CAD file of the completed survey in an AutoCAD 2000 (or more recent) compatible format, as approved by the Department.
 - 1) The CAD file shall include the DTM (Digital Terrain Model) used to create the site contours.
 - 2) The CAD file shall include a legend of plan symbols used by the Surveyor.
 - 3) The Surveyor shall furnish a list of layer names and layer characteristics used to create all objects in the CAD file.
 - 4) The Surveyor shall provide a list of any descriptors codes assigned to AutoCAD points.

- 5) Each topographic contour in the CAD drawing shall be assigned to its proper elevation.
- c. Surveyor shall provide an electronic, comma delimited, coordinate text file of all points in the following format: point number, northing, easting, elevation, and descriptor.
- d. CAD files, coordinate text files, and any other digital data shall be uploaded to the project files in e-Builder.

5. SUMMARY

- a. Surveyor shall keep all field notes and office computations in a neat and orderly manner, clearly indexed. Same shall be available for inspection and checking during or at any time after the course of the work.
- b. The completion of a project or the issuance of plans does not necessarily relive the Surveyor of his obligation or responsibility. The Surveyor may be required to obtain additional information or check previous work if, in the opinion of the Engineer, such information is required to complete the project.

SAMPLE PROPOSAL FORM
[on Surveyor's Letterhead]

Date: _____

To: [Professional] _____

Proposer: [Surveyor] _____

Re: **PROPOSAL FOR LAND/PROPERTY/TOPOGRAPHIC SURVEYS**

Project Number: _____ Phase: _____ Proposal Due Date: _____

Project Title: _____

Location: _____ Client Agency: _____

Date of Proposal Invitation: _____

Maximum Number of Days Allowed for Completion of Survey Work: _____

1. SURVEYOR

Individual or Firm Name: _____

Principal (Name): _____

Pennsylvania Registration Number: _____ Date: _____

Business Address: _____

_____ Zip Code: _____

Business Telephone Number: _____

Location of Site: _____

Approximate Area of Site: _____

Description of Site: _____

Description of Survey Proposed To Be Performed
(Scale, Contour Interval, Etc.): _____

2. COST ESTIMATE

Notes: 1. Billing rates for additional services shall be employee gross hourly rate times a multiplier not greater than 3, and not exceeding \$180.00 per hour.
2. Refer to the Agreement for Professional Service, Paragraph 4.

a. Principal: _____ Hours @ \$ _____ / Hour = \$ _____

b. Chief of Surveys: _____ Hours @ \$ _____ / Hour = \$ _____

c. Surveyor: _____ Hours @ \$ _____ / Hour = \$ _____

d. Surveyor Assistant: _____ Hours @ \$ _____ / Hour = \$ _____

e. Survey Technician: _____ Hours @ \$ _____ / Hour = \$ _____

f. Draftsperson/CAD Operator: _____ Hours @ \$ _____ / Hour = \$ _____

g. Other Personnel Categories (Note: In lieu of the individual survey staff rates above, proposed 2-man or 3-man survey crew rates are acceptable if identified below):

_____ Hours @ \$ _____ / Hour = \$ _____

_____ Hours @ \$ _____ / Hour = \$ _____

_____ Hours @ \$ _____ / Hour = \$ _____

h. Photogrammetry (if applicable, give description and breakdown):

_____ Hours @ \$ _____ / Hour = \$ _____

Lump Sum = \$ _____

i. Breakdown of Reimbursables:

_____ @ \$ _____ / _____ = \$ _____

_____ @ \$ _____ / _____ = \$ _____

_____ @ \$ _____ / _____ = \$ _____

TOTAL COST ESTIMATE: \$ _____

Proposer:

Surveyor Signature

Date

Surveyor Printed Name

Title

PROTOCOL REGARDING ASBESTOS, LEAD, PCB'S/MERCURY, RADON AND OTHER HAZARDOUS MATERIALS

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*Available upon request; contact the Design Manager.

PROFESSIONAL'S RESPONSIBILITIES TO THE DEPARTMENT

- A. Most major building renovations or additions will encounter some kind of hazardous material (Asbestos, Lead, PCB, Radon, etc.) during the Project and the Professional is responsible for addressing all hazardous materials to the extent they may impact the Project. Professional services necessary for the remediation of such hazardous materials shall be covered under Basic Services, except as noted below or in the Project Scope and Professional Agreement. A Hazardous Materials Survey and Quality Assurance Hazmat Monitoring are considered Additional Services, as described herein. The Additional Services protocol is described below:
- 1) The Professional shall establish the qualifications and solicit proposals from at least three (3) qualified consultants in their fields unless their own staff will be providing these services. The Hazardous Materials Survey work is to be completed prior to the Design Development submission so it can be part of the Project scope. This document is intended to provide guidance for the Professional and their Consultant.
 - 2) After receiving proposals back from at least three (3) solicited firms, the Professional shall select the firm which can best provide the services at the lowest cost to the Department. If the lowest proposal is not chosen, the Professional must document and justify to the Department the reason for the alternate selection. The documents submitted to the Department must include the original solicitation and all proposals received. A not-to-exceed Work Order will then be processed by the Design Manager. Please keep in mind that the firm(s) selected may not proceed until the Additional Service Work Order has been approved.
 - 3) Hazmat Design By The Professional
Based on the results of Hazardous Materials Survey and Report, the Professional shall engage a Pennsylvania Department of Labor and Industry (L&I) Certified Asbestos Project Designer (a consultant or in-house staff) to develop the design and documentation for asbestos abatement and/or other hazardous materials as applicable. These costs are part of the Professional's Basic Services and are not reimbursable. All hazardous materials (Hazmat) design that will be impacted by the proposed project needs to be addressed by competent individuals for that field. The Department has a broad outline of procedures to be followed for asbestos abatement and/or remediation of other hazardous materials. The Professional shall prepare all specifications and drawings, and obtain approvals as outlined by the Department. The design shall meet EPA, OSHA, DEP, L&I regulations, and local codes. Guidance documents are provided in other sections of this document to indicate the level of detail expected for the Project work. All abatement work is included within the Base Construction amount and thereby included in the Basic Services fee.

4) Hazardous Materials Survey

The Hazmat Survey shall include researching available survey reports, historical data and test data, surveying the site, sampling and testing all suspect hazardous materials in or adjacent to the Project areas. Previous existing asbestos survey reports for Commonwealth-owned buildings should be obtained from the Client Agency. If not available from the Client Agency, contact the Design Manager. The Hazmat survey shall develop a complete survey report, with sample locations on mini-plans, quantities and tabulated sample results, and shall include strict chain-of-custody procedures. The Hazmat survey may include identification of asbestos, lead based paint, PCB's, miscellaneous hazmat items, ASTs/USTs, and radon, as applicable to existing conditions of the project. The survey report shall include all test results, both positive and negative. Ensure that suspect ACMs, including roofing, are sampled, not assumed, where impacted by the Project Scope. When a survey involves lead based paint identification, results of all levels of lead shall be reported as to comply with OSHA regulations. Reporting HUD threshold levels only will not be accepted. Sampling of ballast capacitors for PCB's is not required; only a survey of 10% of ballast labeling is required. The not-to-exceed proposal shall include, but not be limited to, sample collection, laboratory testing, labor, equipment, materials, travel and report preparation as related to the on-site survey evaluation. Do not include Abatement Design as part of the Hazardous Materials Survey services. Note: the identification of hazardous materials shall be limited to the specific Project areas, and does not necessarily include the whole building. The report executive summary must clearly document and accurately identify all hazardous materials impacted by the proposed construction project, and recommend specific abatement procedures or controls for each material type per work area. The Professional shall provide access to building plans and/or coordinate a walk-through of areas to be surveyed, so proposals reflect field conditions of the Project. A cost estimate for recommended abatement for all hazardous materials must be included in the Executive Summary. ***[A sample proposal letter is found in herein, and additional RFP letters/bid forms can be provided by DGS's Hazmat Reviewer upon request, as hazmat scope differs between projects.]***

5) Quality Assurance Hazmat Monitoring

The Quality Assurance (QA) Hazmat Monitoring services shall include on-site daily inspections during abatement activities, monitoring regulation compliance, verifying compliance with requirements of the specification, collection of appropriate samples during the abatement work, project documentation and final clearance testing and reporting. The proposals solicited shall include a daily rate which includes all travel, equipment, motels, subsistence and associated costs to perform the work, plus itemized unit cost prices for applicable analyses of samples collected for the duration of the Project. Quotations shall be not-to-exceed amounts. A sample proposal letter is found in Section C, and additional RFP letters/bid forms can be provided by DGS's Hazmat Reviewer upon request, as hazmat scope differs between projects.

- B. Quality Assurance services shall be provided continuously when asbestos work is taking place. For lead based paint disturbance activities, provide QA services intermittently to monitor activities and to ensure compliance with the approved Action Plan. QA services for lead shall be provided when visual inspections and/or clearance testing is needed. Daily on-site lead QA services are not needed once compliance with Action Plan means and methods have been established. Instruct the QA firm to schedule on-site personnel accordingly, and not to exceed the estimated number of days established by the Professional in the RFP.
- C. Refer to the Project Procedure Manual and Professional Agreement/General Conditions for guidance on Additional Services procedures. If there are any questions, contact the Design Manager.

SAMPLE REQUEST FOR PROPOSAL FOR HAZARDOUS MATERIAL SURVEY***[on Professional's Letterhead]***

Date: _____

To: *[Consulting Firm]* _____

Re: **REQUEST FOR PROPOSAL FOR HAZARDOUS MATERIAL SURVEY**

Project Number: _____ Phase: _____ Proposal Due Date: _____

Project Title: _____

Location: _____ Client Agency: _____

Dear ***[Consulting Firm]***:

We are requesting a not-to-exceed Proposal (including unit prices, labor & material breakdown) to survey for hazardous materials (asbestos, PCB Ballasts, mercury, and any other hazmat items) ***[edit for project scope]*** needing to be abated, as they may impact the above-referenced Project.

The survey shall include reviewing available survey reports for completeness, researching historical data and test data, surveying the site, estimated abatement costs, sampling and/or identifying all suspect hazardous materials that affect Project areas. Quantities are to be provided for all hazmat items. (See attached Scope of Work.)

Description of the Project: ***[Briefly describe the Project, including number of buildings, year(s) of original construction, overall square footage per building, number of floors per building, square footage per floor, etc.]***

The Hazardous Materials Survey will be used to develop a complete report, with sample locations on mini-plans, quantities and tabulated sample results, include strict Chain-of-Custody procedures. Existing previous asbestos survey reports for this Commonwealth-owned building are available from the Professional. To avoid duplication, do not resample homogeneous areas that are not questionable. Only sample suspect material previously omitted or where results/sampling are questionable. Do not assume suspect asbestos materials to be positive without sample data.

The not-to-exceed Proposal shall include, but not limited to, sample collection, laboratory testing, labor, equipment, materials, travel and report preparation, as related to the on-site survey evaluation. Provide unit costs to support the Proposal. Invoices shall reflect actual costs incurred. Do not include Abatement Design as part of the Hazardous Materials Survey services. The report Executive Summary must clearly document and accurately identify all hazardous materials impacted by the proposed construction project. A cost estimate for abatement of all hazardous materials must be included in the Executive Summary.

The Hazardous Materials Survey shall include identification of asbestos, PCB's, and any hazmat items present that would need to be abated prior to demolition, as applicable. Sampling of ballast capacitors for PCB's is not required; only a survey of 10% of ballast labeling is required. The survey report shall include all test results, both positive and negative. Ensure that suspect ACM's including roofing, firedoors, window glazing/caulking are sampled, not assumed, where impacted by the Project Scope.

Should you wish to visit the building(s) prior to submitting your proposal, please contact the Design Manager to make arrangements.

Please submit your Proposal by _____ ***[insert date]***.

The deliverable report shall be submitted by _____ ***[insert date]***.

Very truly yours,

[PROFESSIONAL]

BREAKDOWN FOR HAZARDOUS MATERIALS SURVEY

[Professional to edit this form (add or delete) to reflect HazMat scope for the Project. For asbestos, provide an estimated number of PLM samples so Proposals can be evaluated equally. The number of samples estimated will depend on the size of the building and whether previous documentation exists. For lead, no survey may be required, depending on age of building.]

A. ASBESTOS Survey: _____ Hours @ \$ _____ / Hour = \$ _____

PLM Tests: _____ Samples @ \$ _____ / Sample = \$ _____

ASBESTOS SUBTOTAL \$ _____

Unit Costs: PLM Point Counting: \$ _____ / Sample A.

TEM Tests: \$ _____ / Sample

B. PCB's/MERCURY: PCB scope includes visual identification of 10% of ballast labels and sampling of suspect components/vessels. Mercury scope includes identification of suspect bulbs/switches, no samples, etc.

Survey: _____ Hours @ \$ _____ / Hour = \$ _____

Unit costs: PCB: \$ _____ / Sample B.

C. MISCELLANEOUS HAZMAT ITEMS: This a lump sum cost for survey identification of items (sample collection if appropriate) including, but not limited to, refrigerants, batteries, smoke detectors, stored chemicals/drums, AST's/UST's, and other suspect materials. Provide a cost here only if it is in addition to other survey identification services specified above. Proposer can add Unit Cost items as applicable to the survey requirements as needed, if known.

Survey: _____ Hours @ \$ _____ / Hour = \$ _____

Unit costs: _____: \$ _____ / Sample C.

D. FINAL REPORT (lump sum to include (1) CD): = \$ _____

D.

E. UNIT COST FOR ANALYSES (if needed):

Unit costs: TCLP: \$ _____ / Sample

Drum/Container Fluid/Sludge Characterization: \$ _____ / Sample

PCB: \$ _____ / Sample

Lead Bulk: \$ _____ / Sample

Other: \$ _____ / Sample

TOTAL NOT-TO-EXCEED PRICE (A+B+C+D): \$ _____

Note: Invoices to Professional shall reflect actual costs incurred based on Unit Costs above, and may not exceed the not-to-exceed price.

SAMPLE REQUEST FOR PROPOSAL FOR QUALITY ASSURANCE HAZMAT MONITORING*[on Professional's Letterhead]*

Date: _____

To: [Consulting Firm] _____

Re: **REQUEST FOR PROPOSAL FOR QUALITY ASSURANCE HAZMAT MONITORING**

Project Number: _____ Phase: _____ Proposal Due Date: _____

Project Title: _____

Location: _____ Client Agency: _____

Dear **[Consulting Firm]**:

We are requesting a not-to-exceed Proposal (including unit prices, labor & material breakdown) for Quality Assurance Hazmat Monitoring services, with respect to the asbestos, PCBs, mercury, miscellaneous hazmat/universal waste, and lead paint activity portions **[edit for project scope]** of the above-referenced project. Invoices shall reflect actual costs incurred. The Quality Assurance Hazmat Monitoring services shall include on-site daily inspections during abatement activities, monitoring regulation compliance, requirements of the specification, collection of appropriate samples during the abatement work, project documentation and final clearance testing and reporting. The proposals solicited shall include a daily rate which includes all travel, equipment, motels, subsistence and associated costs to perform the work, plus itemized unit cost prices for applicable analyses of samples collected for the duration of the Project. Quotations shall be not-to-exceed amounts.

The Quality Assurance Hazmat Monitoring firm, hereafter referred to as the 'QA', shall be on site continuously when asbestos work is taking place. The QA firm shall review the Lead Action Plan and make recommendations to Professional for its approval and compliance with Section 010400 and monitor as required. No lead samples anticipated at this time. For lead based paint disturbance activities, provide QA services intermittently to monitor activities and to ensure compliance with Action Plan. The QA firm shall monitor the project work in compliance with the specification requirements and attend meetings when required for hazmat monitoring work activities being performed by the Contractor.

The duration of the combined asbestos and lead related work is estimated to be _____ shifts. (Some days may be just asbestos activities, others just mercury, misc. hazardous materials, lead activities, and some combined.)

QUALITY ASSURANCE HAZMAT MONITORING**A. NATURE AND SCOPE OF THE WORK**

1. This contract for quality assurance work by the Quality Assurance Hazmat Monitoring firm shall include all inspection, equipment, sample collection, transportation, required meetings and analysis of samples. The QA firm must ensure the following tasks are completed as part of its work: complete removal and decontamination of all asbestos and hazmat materials by abatement contractor as required by the project specifications; areas of the building beyond the Work Area are not to be contaminated by airborne dust or debris released by any phase of the work.

2. The QA firm shall use a fully accredited testing laboratory which specializes in performing bulk and air sample testing. The agreement between the testing laboratory and the QA firm shall be such that turnaround time for sample analysis shall not hinder the Project schedule. The testing laboratory used shall at a minimum be accredited by the NIOSH PAT Program (Proficiency Analytical Testing) for PCM and NVLAP accredited for bulk sample analysis, and lead NLLAP for laboratory wipe and soil sample analysis.
3. At the completion of this project the QA firm shall certify using the appropriate Certification Of Visual Inspection form(s) found at end of specification section(s), that all asbestos containing materials have been completely and satisfactorily removed, decontaminated, and disposed of in accordance with project specifications and all applicable codes, laws and regulations.
4. The entire quality assurance work shall be performed to the complete satisfaction of the Department. Full cooperation of the Asbestos Abatement Contractor is essential for the successful completion of this Project.
5. The QA firm is retained for the benefit of the Department only. The work of the QA firm will not relieve any of the responsibilities of the Asbestos Abatement Contractor including supervision, inspection, testing and quality control work.
6. The Asbestos Abatement Contractor will provide access to work areas and furnish such incidental labor and assistance as is deemed necessary by QA firm's personnel.
7. Personnel representing the QA firm will not act as foreman or perform other duties for the Asbestos Abatement Contractor.
8. The QA firm is not authorized to revoke, alter, relax, enlarge or release any requirements of the Asbestos Abatement Specifications. The QA firm shall report and make recommendations to the Department through the Professional and attend required meetings.
9. The QA firm shall review the Contractors Action Plan, which describes specifically how work is to be completed for each abatement phase, and other submittals as required in the specifications. Approval of the Action Plan and submittals must be obtained through the Professional prior to the start of work.

B. TASKS SPECIFICATION

1. Field Inspection, Air Sampling and Monitoring
 - a) The QA firm shall furnish a full time field Quality Assurance Inspector for the Abatement Project who meet the following minimum requirements: Asbestos - a minimum one year related experience and successful completion of a NIOSH #582 course "Sampling and Evaluating Airborne Dust" or equivalent, and two years related experience in project monitoring germane to the project abatement scope for this project; an individual who will take immediate action that is necessary for the protection of the building, environment, and persons in the work area(s); an individual who will comply with and enforce federal, state and local regulatory protocol and contents of the specification; an individual who will be at the site at all times when abatement related work is in progress. If asbestos bulk sample collection is required, the QA Inspector must be accredited by PA L&I as a Building Inspector for lead and asbestos. The QA firm must provide a microscope on site for asbestos PCM clearance analysis, if requested, for immediate turn-around.
 - b) Inspections will include checking the standard operating procedures, engineering controls, personal protection equipment, decontamination procedures, packaging and disposal of waste, and any other aspects of the project that may affect the health and safety of the building occupants.
 - c) The QA firm shall, by visual and physical means, assure satisfactory removal of asbestos and/or lead containing material and the satisfactory disposal of same.

- d) The QA firm shall collect necessary bulk, wipe, air, and soil samples as outlined in the project specifications, and deliver the same to the laboratory in a timely manner. Noncompliance of sample collection criteria may result in adverse action taken by the Commonwealth against the QA firm. All necessary sampling and other related equipment shall be furnished by the QA firm.
- e) Project monitoring of the work areas and surrounding environment shall be conducted by the QA firm during the execution of the Project so as to comply with all codes, regulations, ordinances, specifications, and to monitor and maintain safe levels in occupied buildings and take corrective measures to reduce contamination levels outside work areas, if necessary.
- f) The QA firm shall be responsible to perform a visual inspection of the work area(s) to ensure complete removal of asbestos and/or lead containing materials or other hazmat items per scope of the project work. If the visual inspection fails, the abatement contractor will be instructed to decontaminate remaining asbestos and/or lead containing materials per scope of work to the satisfaction of the QA firm. The QA firm shall utilize the appropriate Certification of Visual Inspection Form.
- g) Baseline sampling shall be performed by the QA firm in each work area for asbestos in OCCUPIED buildings only prior to commencement of the work for each work area location. For asbestos, the clearance monitoring (PCM) shall be lower than the background readings established by pre-job monitoring, or 0.01 f/cc, whichever is higher. This baseline schedule outlines minimum requirements.
- h) In addition to what is prescribed in this RFP letter, the QA firm shall follow the abatement scope provided in the specification.
- i) For asbestos, air samples shall be collected, but not necessarily limited to, the following schedule or as directed by the Department.

AREA	WHEN	NUMBER	MINIMUM VOLUME (liters)	FLOW RATE (liters/min.)
Work Area (PCM)	Prior to job start	2	1500	2-10
Work Area (PCM)	During area isolation	Daily ¹	480-960	1-2
Work Area - Inside (PCM)	During abatement work	Daily ¹	480-960	1-2
Work Area – Exterior (PCM) ²	During abatement work	Daily ¹	1000	2-10
Work Area (PCM) ³	Upon work (pre-clearance) completion	2 (minimum)	1500	2-10
Work Area (TEM) ³	At completion (final)	1 ³	1200	2-10

Schedule Notes:

- Consecutive daily air samples will be collected for the duration of the work shift for each active work area.
- Exterior work area(s) samples shall be collected daily at decon clean room entrance, load out exit, discharge of HEPA exhaust units, and area(s) adjacent to work area(s) that are occupied or will be re-occupied.
- Aggressive air sampling must be conducted when work area is prepared as a negative pressure enclosure.

- j) The QA firm is responsible for ensuring 8 hour TWA personal monitoring air samples in workers breathing zone per OSHA regulations is performed daily by Asbestos Abatement Contractor or its air monitoring firm.
 - k) The QA firm is responsible for ensuring the thirty (30) minute excursion monitoring air sampling as required per OSHA regulations is performed daily by Abatement Contractor or its air monitoring firm.
2. Laboratory Testing and Analysis
- a) For asbestos, analysis of required air test shall be performed by Phase Contrast Microscopy (PCM) per NIOSH 7400 method. Asbestos bulk samples shall be analyzed by a laboratory having NVLAP accreditation. For lead, analysis of required air test shall be laboratory analysis by either EPA SW-846 method 7420, NIOSH 7082 or 7300 methods. TCLP samples shall be analyzed by EPA SW-846 method 7420 or an equivalent method. Wipe, soil, and paint chip samples shall be analyzed by EPA SW-846 method 7420 or an equivalent method such as NIOSH 9001 method, or EPA 600/8-91/231. Laboratories performing wipe and soil analysis shall be NLLAP accredited. XRF analysis for air or soil samples is not acceptable for work on this project. Samples must be received at the laboratory and be analyzed for verbal results within twenty-four (24) hours of the time the samples were collected, unless otherwise agreed upon by the Professional/Department. Written results must be provided within three (3) days.
 - b) Bulk sampling and analysis are to be performed only if materials were not tested or those not identified during the original survey are encountered during the abatement work. Strict adherence to Chain-of-Custody procedures shall be followed for all sampling, including use of Chain-of-Custody form.
3. Reports Required:
- a) Action Plan Reports. The QA firm shall submit prompt reports to the Professional so that, if required, modifications to work methods and/or practices may be implemented as soon as possible, if such action is required. Advance verbal reports shall be made to expedite action.
 - b) Inspection Reports. Brief, but complete daily inspection reports concerning the daily activities and progress of the Asbestos Abatement Contractor and QA firm shall be promptly submitted to the Professional every week. Sampling location maps must also be completed daily. Daily sample collection records shall be kept daily that indicate sample numbers, date and time samples were collected, calibrated pump flow rate, date of pump or rotometer calibration, total number of liters of air drawn, pump time on and time off. Special reports, verbal reports, including documents required herein shall be submitted as necessary. Photographs should be taken as needed.
 - c) Analysis Reports. The QA firm shall give verbal notification to the Professional of the results of each analysis result within twenty-four (24) hours of the time the samples were delivered to the laboratory. The laboratory shall confirm the results in writing within three (3) days thereafter. Any analysis result which indicates contract requirements are not being complied with shall be brought to the attention of the Professional immediately by telephone. Written confirmation shall follow. The Asbestos Abatement Contractor shall fully cooperate with the Professional and the Department in correcting all such conditions.
 - d) Final Report. At the close of each Asbestos Abatement Project, the QA firm shall submit a Final Report to include the following:
 - i. shall include all project documentation including, sample location maps, sample collection data, abatement quantities, photographs, daily logs including time of arrival and departure, and sample analysis reports. Organize report, by date, in ascending chronological order.

- ii. shall contain completed disposal verification using EPA NESHAP Waste Shipment Record form and a completed Certificate of Visual Inspection form for each work area, that asbestos and/or lead containing materials have been completely and satisfactorily removed, area decontaminated, and waste disposed of in accordance with project specifications.

- e) Report Submission. Four (4) CDs of all reports must be submitted to the Professional who will make the distribution to the Department. The deliverable report shall be submitted to our office three weeks after completion of abatement.

Please submit your Proposal by _____ ***[insert date]***.

The deliverable report shall be submitted no later than three (3) weeks after abatement is completed

Very truly yours,

[PROFESSIONAL]

TIME AND MATERIAL RATES FOR ASBESTOS, PCB/MERCURY & MISCELLANEOUS/UNIVERSAL WASTE AND LEAD RELATED ACTIVITIES

A. PROJECT MANAGER: \$ _____ / Hour
A.

B. ENVIRONMENTAL/INDUSTRIAL HYGIENIST TECHNICIAN: To monitor asbestos, mercury & miscellaneous hazmat/universal waste project monitoring in accordance with project plans and specifications (includes travel, equipment, motel, subsistence, and other associated costs). The QA firm shall review Lead Action Plan and make recommendations to Professional for its approval and compliance with Section 010400 and monitor as required. No lead samples anticipated at this time.

Daily QA services shall be provided when asbestos, PCB/Mercury, miscellaneous hazmat work is taking place.

- Monday through Friday
- Inclusive of up to 8.5 hours on site
- Inclusive of up to 10 asbestos PCM air samples per shift

Number of estimated shifts: _____ \$ _____ / Shift
B.

C. FINAL REPORT (lump sum to include (1) CD): \$ _____
C.

TOTAL NOT-TO-EXCEED PRICE (A+B+C): \$ _____

D. UNIT COST FOR ANALYSES (if needed):

Fee for an Environmental/Industrial Hygienist Technician Hours in excess of 8.5 hours per shift	\$ _____ / Hour
Additional air samples analysis via PCM (<24 hr TAT)	\$ _____ / Sample
Additional air samples analysis via PLM (<24 hr TAT)	\$ _____ / Sample
Additional air samples (lead) analysis via FLAA	\$ _____ / Sample
Additional lead wipe samples	\$ _____ / Sample
Air sample analysis via TEM- 24 hour turnaround	\$ _____ / Sample
TCLP (3 day turnaround)	\$ _____ / Sample
Other: _____	\$ _____ / Sample

Based on the number of estimated days provided for the duration of asbestos/lead activities and the above unit prices, provide a not-to-exceed total cost. Estimate number of samples, hours, etc. Invoices shall reflect actual costs incurred. The deliverable report shall be submitted to our office three weeks after completion of abatement.

Daily QA services shall be provided when asbestos work is taking place. For lead based paint disturbance activities, provide QA services intermittently to monitor activities and to ensure compliance with Action Plan. QA services for lead shall be provided when visual inspections and/or clearance testing is needed. Daily on-site lead QA services are not needed once compliance with Action Plan means and methods have been established. QA firm shall schedule on-site personnel accordingly **not to exceed the number of days estimated in their proposal.**