pennsylvania

DEPARTMENT OF GENERAL SERVICES

BUREAU OF
ENGINEERING AND ARCHITECTURE

PROJECT PROCEDURE MANUAL

2010 EDITION

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

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 Administrative Procedures describes, in greater detail, the Professionals' construction administration procedures and responsibilities.

All individuals representing the design firm and its consultants should become thoroughly acquainted with this manual's contents.

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

The E/A Project Procedure Manual, with all subsequent amendments/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.state.pa.us.

BUREAU OF ENGINEERING AND ARCHITECTURE
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PROJECT ADMINISTRATION

SECTION 100 - INTRODUCTION

100.1 MANUAL'S PURPOSE. The Engineering and Architecture Project Procedure Manual ('the Manual') 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 download the current version of this Manual from the DGS website, at the inception of each Project.

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 Project Coordinator. Prior written approval is to be obtained before making a deviation.

SECTION 101 - REFERENCE AND STANDARD DOCUMENTS

101.1 MANUAL INCORPORATED INTO PROFESSIONAL AGREEMENTS. This Project Procedure Manual is incorporated into the Professional Agreement 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 (Using Agency). Three (3) bureaus operate under the Deputy Secretary; the Bureau of Engineering and Architecture, the Bureau of Professional Selections and Administrative Services, and the Bureau of Construction.

102.2 BUREAU OF ENGINEERING AND ARCHITECTURE. The Bureau of Engineering and Architecture (E/A) administers the professional services and the Project during the design stages.

A. Divisions: E/A is organized into five (5) Divisions by function; Institutional Project Management Division, Public Project Management Division, Governmental Project Management Division, DGS Project Management Division, Engineering and Architectural Design Division.

B. Project Coordinator: The Project Coordinator is the Bureau's project administrator. The Project Coordinator is the Professional's and Using Agency's primary point of contact with the Department's Bureau of Engineering and Architecture.

102.3 BUREAU OF PROFESSIONAL SELECTIONS AND ADMINISTRATIVE SERVICES. The Bureau of Professional Selections and Administrative Services (BPSAS) provides administrative support to Public Works. Major functions include:

A. It establishes Public Works projects through the receipt of Requests for Project Action (Scope) for Capital Budget authorized projects, and through the receipt of Agency funded work requests, and administers the Professional Selection process.

B. Administers the construction contract Procurement Stage of all projects including, advertising, bulletins, bid openings, and award.

C. Its Fiscal Unit receives and processes all invoices, maintains financial accounts and project funding data.

D. Administers the Claim Resolution process; both Professional and Construction Contractor.

102.4 BUREAU OF CONSTRUCTION. The Bureau of Construction manages the professional services and 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 E/A assists with administration of professional services.

SECTION 103 - CORRESPONDENCE

103.1 NUMBER OF COPIES. All correspondence with E/A is to be addressed to the Coordinator. The original is to be accompanied by two (2) copies (including all enclosures or attachments) in the same envelope. Mark one of the copies for the Coordinator by name. The Bureau's mailing address is:

(Coordinator's Name)
Bureau of Engineering and Architecture
Department of General Services
Headquarters Building
18th and Herr Streets
Harrisburg, Pennsylvania 17125

103.2 ASSOCIATED CORRESPONDENCE. Multiple copies, as specified in 103.1, of all of the Professional's correspondence to the Agency, the Institution, a regulatory agency, or any other party, are to be sent to the Coordinator.

103.3 CORRESPONDENCE FROM THIRD PARTIES. The Professional is to send the Coordinator three (3) copies 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, however, a separate letter addressing the matter is necessary.

103.4 IDENTIFICATION. All correspondence, faxes, e-mail, and other transmittals must carry the DGS Project Number (including Phase and Part when used) and title. The subject of the correspondence should also be referenced.

Example:

Sub: Selection of Paving Stones

Re: Project No. 400-51, Phase 2
Part A – Parking Lot
Student Union Building
Commonwealth University
Harrisburg, Pennsylvania 17120

103.5 E-MAILS. E-mail is acceptable for normal correspondence; however, all e-mail correspondence regarding critical information (i.e. project schedule, cost, contract terms, services, fees, scope of work, critical decisions and directions, etc.) must be followed by a hard copy in letter form and sent to the Project Coordinator for record purposes.

103.6 FAXES. When approved by the Coordinator, correspondence may be sent by fax to (717) 772-2036. Limit faxes to urgent correspondence only.

SECTION 104 - MEETINGS, MINUTES AND REPORTS

104.1 MINUTES. The Professional is to furnish minutes of all meetings with DGS, the Agency or other bodies. The minutes are to be sent to the Project Coordinator within one (1) week following the meeting. Minutes shall be provided in hard copy, as per the requirements of Section 103, above.

104.2 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 confirmed hard copy to the Project Coordinator.

104.3 PROGRESS REPORTS. The Professional is to furnish a Monthly Progress Report during the Design Stages with its monthly invoice. The Report must include at least the following information: (Refer to Chapter 15 for format of Monthly Progress Report).

A. Percentage of design/document completion of each discipline (i.e. architectural, structural, HVAC, etc.)

B. Significant actions taken during the period

C. Anticipated circumstances that may affect schedule or cost

The Monthly Progress Report must be submitted to the Project Coordinator, even if an invoice is not submitted for that month.

SECTION 105 - PAYMENTS AND FEES

105.1 INVOICE FORMATS. All invoices for Professional Services must be submitted on the appropriate invoice format. To obtain the current invoice formats, or if you have any invoicing questions, the Professional shall send an e-mail request to the DGS Fiscal Unit.

105.2 INVOICES FOR BASIC SERVICES. All invoices for Basic Services during the Design Stage must be submitted in a standard format, an original and two (2) copies, as provided by the Department's Fiscal Unit in electronic format to:

Submissions Office, Room 204 Headquarters Building
Bureau of Engineering & Architecture
Department of General Services
18th & Herr Streets
Harrisburg, Pennsylvania 17125

Invoices for all Construction Administration Services payments during the Construction Stage must be submitted in a standard format, an original and two (2) copies, as provided by the Department's Fiscal Unit in electronic format to the appropriate Construction Regional Director:

Fiscal Unit, Arsenal Building
Bureau of Professional Selections & Administrative Services
Department of General Services
18th & Herr Streets
Harrisburg, Pennsylvania 17125

105.3 INVOICES FOR ADDITIONAL SERVICES. All invoices for Additional Services, on the appropriate invoice format, are to be sent to the Bureau of Engineering & Architecture, Submissions Office, as indicated above. Invoices must be submitted separately for each Additional Service, in accordance with the instructions in the specific Work Order. Final invoices for that service must be marked 'FINAL'.

105.4 CHANGE ORDERS. 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 the Basic Services Fee percentage established for the Project, applied to the Change Order amount, with no increase or reduction of fee for Credit Change Orders. The Professional must invoice for payment for fees on Change Orders.

105.5 FEES FOR ADDITIONAL SERVICES. All Services beyond Basic Services must be authorized by Work Order by DGS prior to commencing work. Additional Services are compensated at actual costs, except where otherwise stated in the Agreement General Conditions. The Professional shall submit a not-to-exceed 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.

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 Administrative Services. It is the Professional's responsibility to provide current certificates, as the previous certificates expire.

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 Coordinator. 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 EVALUATION

107.1 STAGES EVALUATED. The Coordinators, and/or Construction Inspector Supervisors render confidential evaluations of Professionals' and Consultants' performance at the conclusion of the following stages:

Schematic Design
Design Development
Construction Documents
Overall Design Evaluation (Post Bidding)
Construction Contract Administration: 20% Complete
Construction Contract Administration: 40% Complete
Construction Contract Administration 60% Complete

Construction Contract Administration 80% Complete
Construction Contract Administration: 100% Complete (Summary of Construction Stage)
Construction Contract Administration: Post Construction

107.2 USE OF RESULTS. Evaluations are strictly confidential and maintained only for Department's use. Complete evaluation results will not be released to Professionals or their Consultants. The Professional will, however, be advised of a less than satisfactory performance evaluation, with opportunity to respond. Evaluations are purged five (5) years after a project completion.

SECTION 108 - SUSPENSION AND REACTIVATION

108.1 SUSPENSION AND REACTIVATION. The Project may be suspended by the Department at anytime during its several stages. 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 additional compensation for reactivation, see General Conditions to the Agreement.

SECTION 109 - SELECTION OF CONSULTANTS

109.1 CONSULTANTS. Consultants listed on the Professional's 150-ASP Form, and Exhibit A of its Agreement, must be used, unless otherwise justified by the Professional and approved in writing by DGS. The Professional must submit all Consultants not listed on Form 150-ASP to the Department for approval.

SECTION 110 - SCOPE AND BASE CONSTRUCTION

110.1 THE SCOPE. The Project Scope is as generally described in the Request for Project Action for Capital Budget projects or the Work Request for Agency-Funded projects, as supplemented by the additional documentation included in that package. The Scope is incorporated into the Agreement and is sent to the Professional prior to the Orientation Conference. The Scope is not necessarily the Program, but is a brief description of the Project, including the Base Construction.

110.2 CHANGES IN SCOPE. The sole interpreter of the Scope is DGS 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 and 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. The Base Construction is the amount of money available for the construction of the Project. Funds for design fees and contingencies, such as land and topographic surveys, subsurface investigation, testing laboratory and Change Orders are not taken from the Base Construction. It is the Professional's responsibility to design the Project within the Base Construction. The Base Construction can be changed only by DGS and only with an amendment to the Agreement. Utility service installation and construction to provide an operational facility are to be included within the Base Construction. Loose equipment and furnishings are not generally included in the Project.

110.5 ESCALATION. The Base Construction amount includes all monies available for construction. Escalation must be included as a separate item, projected to the anticipated mid-point of construction, on all cost estimates. Monthly escalation percentages are determined by the Professional based upon 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. The Professional is to immediately stop all work and inform E/A 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 DGS 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. Program information, if available, will be presented by the Agency at the Orientation Conference or Initial Site Visit. 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 Agency to determine detailed program requirements, and shall refine and complete the program.

111.2 PREPLANNING SERVICES. Preplanning 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 preplanning or feasibility studies to the Professional does not relieve the Professional from exercising professional judgment in all matters of design. Any and all items in such studies that are not consistent with the Professional's judgment shall be brought to E/A for adjudication.

SECTION 112 - PROJECT PHASING

112.1 DEFINITION. Phasing 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 parts. Phasing will be at the discretion of the Department. The total Base Construction will not be altered by phasing. The total construction award, including all phases, may not exceed the Base Construction.

112.2 PROJECT NUMBERING. The initial project is always numbered as Phase 1, such as project number DGS 412-45 Phase 1.

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 shall not exceed the original negotiated fixed fee percentage 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 DGS 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 USING AGENCY APPROVAL. The Programming, Schematic, Design Development, and Interim Construction Documents Submissions must, be approved by the Using Agency at, or following, the Review Conference. During the Programming, Schematic and Design Development Stages the design should be closely coordinated with the Using Agency/Institution, so that the Using Agency/Institution is in general agreement with the Program and the Design Concept when submitted to DGS. The Professional is to secure the Using Agency Head's approval in the form of a letter, prior to the Construction Documents Stage approval by DGS.

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 cost of permits, filing fees or similar approvals, obtained during the Design Stages. The Professional shall obtain the necessary Building Permit from Department of Labor and Industry under the PA UCC Code. Commonwealth projects are exempted from the local building permit approval. Where other permit applications are part of the codes approval process, the Professional shall make application and obtain 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 of the Professional Agreement for more definitions.

A. 'Base Construction': The amount of money available for the construction of the Project.

B. '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.

C. 'E/A': The Bureau of Engineering and Architecture.

D. 'Furnish': To supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

E. '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.

F. 'Institution': The particular facility at which the work of the Project is located.

G. '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.

H. 'Provide': To furnish and install, complete and ready for the intended use.

I. '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.

J. 'Quality Control': Testing services required by the specifications, and performed by an agent of the Contractor.

K. 'Using Agency': The Department (other than DGS), Board, Commission, State Agency, State University, State-Aided College or University.

SECTION 115 - CONTRACT INTERPRETATION

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

A. Addenda/Bulletins shall govern over all other Contract Documents.

B. Special Conditions shall govern over all specifications, General Conditions and Drawings.

C. Specifications and drawings shall govern over the General Conditions.

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

SECTION 116 - CONTRACTING METHODS

116.1 METHODS. DGS 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 DGS Project Coordinator 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 of General Services, 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 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 is required to distribute the RFP document (provided by DGS) to proposers along with the bid documents, 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 Engineering and Architecture, 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 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.

200.4 SITE SELECTION. The Professional is to recommend a site when the 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, relationship to existing and future facilities, environmental considerations and other benefits and restrictions, based on information readily available. E/A 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 manmade conditions as well as natural conditions, that may influence the project. As-Built records 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 and Subsurface Investigation).

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. As-Built 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 Agency shall determine if the exploratory hole location is acceptable, considering the facility's operation and assist with relocation, if necessary. The Agency is responsible for actual cutting and patching of the holes. All existing conditions affecting the work shall be documented on Contract Drawings.

201.3 AS-BUILT RECORD DRAWINGS. The Department of General Services (DGS) has in archival storage, As-Built Record Drawings for a majority of the projects constructed by the Department and the Former General State Authority (GSA). In addition, the DGS, Bureau of Real Estate, Space Management Division, has the majority of the architectural plans for the DGS controlled state office buildings on CAD. Professionals are advised to review the documents available at the Agency or Institution and determine their need for as-built drawings. As-Built record drawings are available for viewing at DGS. Review record drawings available at the Institution or DGS and determine the need to obtain prints. See Chapter 15 for applicable printing costs. Prints may be obtained from DGS at cost by written request to:

BPSAS, Project Administration Division
Room G-8, Headquarters Building
18th and Herr Streets
Harrisburg, Pennsylvania 17125
Telephone: (717) 787-3674

201.4 MEASURED DRAWINGS. Preparation of dimensioned measured drawings of the entire building may be authorized as an Additional Service, at the discretion of DGS, when As-Built Record 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 as-built 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. Project design, 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 doing working 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, Regulations and 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 Coordinator. 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 Pennsylvania Uniform Construction Code (UCC) adopted under Act No. 45 of 1999.

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 and obtaining zoning approval and variances prior to Design Development Submission. Attendance at zoning hearing meetings, and the cost of special displays and/or presentations, are considered Additional Services.

202.5 SUBDIVISION AND LAND DEVELOPMENT APPROVAL. The DGS will comply with local subdivision and land development ordinances. Basic Services include making application and obtaining those approvals. Attendance at hearing meetings, and the cost of preparation of additional documents, which are required for approval but which will not become part of the Construction Documents, or are not required for the basis of preparation of the Construction Documents, are considered Additional Services.

202.6 PERMITS. The Professional is to obtain all other design approval permits, such as those issued by DEP, PHMC, Highway Occupancy permits, 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 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 Using 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. A Property/Topographic survey may be provided by DGS, or when authorized, shall be provided as an additional service by the Professional. Chapter 13 contains instructions for obtaining a Property/Topographic survey. Professional should obtain confirmation from public records 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 and cost estimation of rock and soil excavation and fill.

E. Wetlands and other land use evaluation.

F. 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 INVESTIGATIONS. When it is necessary to locate unobservable utility lines, tanks or other objects, due to complexity or special circumstances of the project, the Professional will be authorized, as an Additional Service, 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 Coordinator will inquire and determine that this has been done. When the Project site is on land owned by the Commonwealth, the Using 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. 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 per the General Conditions of the Construction Contract.

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

A. The Professional must send a letter to E/A (accompanied by the Using Agency's endorsement or request) explaining how the product(s) best serves the Commonwealth, and giving the compelling reasons why only this particular proprietary product must be used. The letter is to include the estimated cost of the product, percentage product cost compared to total project cost of the particular Prime Contract, and an opinion of any premium cost for using the non-competitive product.

B. DGS will give written notice of its decision.

C. If the proprietary product is approved, the following statement must be included with the product specification:

"The above item has been approved by the Department as a proprietary item. No other item will be accepted. Articles 19.11 and 19.12 of the General Conditions of the Construction Contract do not apply to the above item."

205.3 RESTRICTED PRODUCTS. DGS does not have a blanket "Buy America" policy. Foreign steel restrictions are covered in Paragraph 205.4. Refer to Section A.25 Product Discrimination in 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, Section A.25 (C) Steel Products Procurement Act for construction contract language.

205.5 ARCHITECTURAL CONCRETE. Cast-in-place concrete as an architectural finish, in all but utilitarian spaces, is prohibited. 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.

A. When an alternate fuel source is proposed, justification for not using coal is required. Information for the type of fuel proposed for this Project supporting the justification must be submitted as part of Basic Services.

B. Include such considerations as:

1. Heating system first costs, and life cycle analysis.
2. Space considerations for handling and storage.
3. Space considerations for equipment.
4. Manpower requirements for operation and maintenance of a coal system.
5. State and Federal Air Quality considerations.
6. Aesthetic appeal of the site, building and/or facility.
7. Other information you consider appropriate.
8. Using natural gas from wells located in PA may be an appropriate justification.

C. Information must be specific enough to present a provable argument for using the proposed fuel in place of coal. An extensive report is not required; information can be presented in letter form addressing items listed above. If more extensive analysis is required, the Department will authorize a Fuel Feasibility Study as an Additional Service. The Fuel Feasibility Study is described in Chapter 13.

205.7 DEVIATION FROM CONSTRUCTION CONTRACT GENERAL CONDITIONS. DGS 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 Coordinator.

205.8 STANDARDS OF QUALITY AND SUBSTITUTION OF MATERIALS. For requirements regarding approved equals or substitutions and use of trade names, refer to Article 19 of 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. The only exception is when the Base Construction amount is less than $25,000.

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 list to follow. Work not listed is to be included in the most appropriate contract after checking it with the Coordinator.

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 a separate contract is required prior to bidding of other contracts).
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. Steam and traffic tunnels.
11. Stage equipment (excluding lighting equipment).
12. Laundry and dry cleaning equipment.
13. Kitchen and cafeteria equipment.
14. Laboratory equipment.
15. Elevators, dumbwaiters, escalators, chair lifts.
16. Fire protection and domestic water distribution system, including fire loops and hydrants (beyond 5’-0” outside building line).
17. Water storage reservoirs, elevated tanks, standpipes (NOTE: If desirable this may be a separate .5 Contract).
18. Sanitary sewerage systems (beyond 5’-0” outside building line).
19. Storm water systems (beyond 5’-0” outside building line).
20. Well drilling for water supply (if separate contract is not desirable).
21. Louvers and similar items that effect building appearance (some furnished to GC by other Primes).
22. HazMat abatement including asbestos, lead, PCB, radon and others.
23. Gas distribution system (beyond 5’-0” outside building line).
24. Foundations and/or supports for all heavy equipment.

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

1. The usual heating, ventilating and air conditioning, 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 General 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 and motor control centers.
9. Motorized intake and exhaust louvers for emergency generators (installed by GC).
10. Duct work for emergency generators.
11. All fuel tanks, including fuel tank and fuel lines for emergency generators.
12. Cathodic protection for steel tanks.
13. Furnish and install generator exhaust piping with insulation.
14. Install muffler (with insulation) furnished by Electrical Contractor.
15. Install day tank furnished by Electrical Contractor.
16. Well drilling for geothermal systems.
17. Lightweight equipment supports and housekeeping pads.

C. PLUMBING CONSTRUCTION CONTRACT (.3):

1. The usual plumbing work for buildings including water, sanitary, rain water conductors and gas connections for building system when connected to nearby local mains.
2. Water treatment equipment.
3. Piping and equipment for sewage treatment plants.
4. Sterilizing equipment.
5. Roof drains (installed by GC).
6. Rain water conductors from roof drains.
7. Fire suppression system.
8. Lightweight equipment supports and housekeeping pads.

D. ELECTRICAL CONSTRUCTION CONTRACT (.4):

1. The usual electrical work for buildings.
2. X-Ray equipment.
3. Electrical distribution.
4. Transformer stations, complete, including fences.
5. Electrical work for hazard lighting of elevated tanks and chimneys.
6. Electrical work in connection with sewage treatment plants (not electrically operated equipment).
7. Street lighting.
8. Electric resistance heating.
9. Emergency generators (furnish day tank and muffler to HVAC Contractor).
10. Lightening protection.
11. Standby generators.
12. Telephone and communications conduit.
13. Telephone and communications wiring when in project.
14. Fire alarm and security systems.
15. Master antenna systems.
16. Wiring for kitchen, laboratory, dental, laundry and other equipment furnished by others.
17. Lightweight equipment supports and housekeeping pads.

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.

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 "Request for Project Action" and a Project Scope statement for all projects. The Project Scope statement may contain background and justification for the Project; and work items contained in the Project, general area requirements. For new construction and major rehabilitation projects, the department may provide a Program Statement describing proposed program activities, space requirements, and equipment needs. The Project Scope statement will be discussed at the Orientation conference and/or initial site visit. The Professional shall meet and work with the Using 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 documents are to present the design concept based upon the program, construction allocation, site location and other factors derived from the pre-design activities. The 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. Sketches may include more than one (1) design option, when permitted by the Department, and 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 Using 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 Using 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 Using Agency to adjust and reduce its program, when the Probable Construction Cost exceeds 80–90% of the Base Construction amount.

300.3 CONCEPT DEVELOPMENT MEETINGS. The Professional is to meet as often as necessary with the Using Agency while developing conceptual studies to generate ideas, accumulate data, analyze and resolve planning problems, and make program and planning determinations. Concepts and schematic diagrams 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 Using Agency, not more than three (3) concept design options, consisting of a 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, indicate which option is its proposed solution, and provide written explanation justifying 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 E/A. Applicable Programming Submission Documents are to be delivered to E/A on or before the date established in the Agreement, unless another date has been approved by DGS. Delivery may be made in person or by commercial courier.

300.6 SUBMISSION TO USING AGENCY. The Professional is to furnish the Using Agency and Institution with complete sets of the Programming Submission documents, as listed below. These sets shall be delivered on the same date that they are delivered to E/A.

A. DEP projects – 1 set Main Office, 1 set Regional Office, 1 set Institution.

B. DCNR projects – 1 set Main Office, 1 set Regional Office (if any), 1 set Institution.

C. Penn State University projects – 1 set.

D. All other Agency projects – 1 set Using Agency, 1 set Institution.

300.7 ENGINEERING PROJECTS. Engineering project requirements 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 Using Agency, the Institution and E/A (along with the Department's consultants) will be scheduled by E/A. The conference will normally occur approximately one (1) week after the submission and is held at E/A's office in Harrisburg. The Professional and its consultants, if required by the DGS Coordinator, must attend.

300.9 CONSTRUCTION MANAGER (CM) AND COMMISSIONING AGENT (CA). When the Department has engaged a Construction Manager or a Commissioning Agent, the Professional is to provide one (1) set of Programming Submission documents to the CM and/or CA, on the same day the submission is delivered to DGS.

SECTION 301 - PROGRAMMING SUBMISSION DOCUMENTS

301.1 PROGRAMMING SUBMISSION PACKAGE. On the scheduled date of the Programming Submission, the Professional shall deliver the following to the Bureau of E/A:

A. Five (5) copies of the Transmittal Letter, with Programming Submission Checklist, duly checked and filled out as appropriate.

B. Five (5) copies of Programming Documents, including site requirements and detailed building space requirements.

C. Five (5) sets of Conceptual Drawings.

D. Five (5) copies of Programming Submission Probable Construction Cost Summary, with Project Information sheet. For blank forms see Exhibits in Chapter 15.

E. Five (5) copies of 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.

F. Three (3) copies of a Statement on Site Restrictions, including zoning, land development, flood plains, waterways, wetlands, hazardous materials, endangered species, historical/archaeological significance, etc.

G. Three (3) set of photographs of proposed sites of new structures or additions to an existing structure. These photographs shall show four (4) views of each site and shall be keyed to the site plans.

H. Three (3) copies of a Report on the Status of LEED Efforts for the Project. 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. Three (3) copies of 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. Three (3) copies of Additional Items requested by the DGS Project Coordinator, or otherwise determined by the Professional to be required for the Project.

301.2 PROBABLE CONSTRUCTION COST. The Probable Construction Cost, which must be within 80-90% of the Base Construction amount, shall be submitted on the form provided as an Exhibit in Chapter 15. 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.

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

A. An overall site plan(s) at a scale appropriate to show existing and proposed structures and site improvements, and indicating the Project's relationship to surrounding improvements and conditions. Using existing available information, site plans should show location of existing utility lines.

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.

301.4 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.

301.5 PROJECT INFORMATION FORMS. The Professional must submit completed copies of applicable forms in Chapter 15.

SECTION 302 - REGULATORY APPROVALS

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

SECTION 303 - APPROVALS AND POST-CONFERENCE ACTIVITIES

303.1 USING AGENCY APPROVAL. The Using Agency's approval must be provided before the Department will approve the Programming Submission. Normally, the Using Agency issues its approval at the review conference.

303.2 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 E/A in a letter following the Review Conference. As per the General Conditions of the Professional Agreement, the Professional shall only invoice up to 90 % of the portion of the Professional fee applicable to the Programming Stage, until the Department approves the submission. Approval of the Programming Submission by the Department is contingent 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 exceeds 80-90% 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.

303.3 MINUTES. The Professional shall furnish minutes of the Programming Review Conference to the Department, Using Agency and Institution, and Construction Manager/Commissioning Agent (if applicable) within five (5) 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.

303.4 DEVELOPMENT MEETINGS. The Professional shall meet with the Using Agency, as frequently as needed, while developing the Project from Programming to Schematic stage. These meetings are to obtain the Using Agency's requirements and instructions, resolve planning and program issues, resolve budgetary issues, and ensure that all needs are addressed.

CHAPTER 4
SCHEMATIC SUBMISSION

SECTION 400 - GENERAL

400.1 PURPOSE. The Schematic Design is to illustrate the concept, scope, scale and relationship of the project components and the probable Construction Cost. Upon approval of the Programming Submission, the Professional shall prepare and submit to the Department and Using Agency, the Schematic Design documents, which shall be based upon the proposed solution. Schematic documents are to present the design concept based upon the Program, Base Construction, site location and other factors derived from the Programming Stage. The 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 E/A. Applicable Schematic Submission documents are to be delivered to E/A on or before the date established in the Agreement, unless another date has been approved by DGS. Delivery may be made in person or by commercial courier.

400.3 SUBMISSION TO USING AGENCY. The Professional is to furnish the Using Agency and Institution with complete sets of Schematic Submission documents as listed below. These sets shall be delivered on the date that they are delivered to E/A.

A. DEP projects – 1 set Main Office, 1 set Regional Office, 1 set Institution.

B. DCNR projects – 1 set Main Office, 1 set Regional Office (if any), 1 set Institution

C. Penn State University projects – 1 set.

D. All other Agency projects – 2 sets Agency, 1 set Institution.

400.4 ENGINEERING PROJECTS. Engineering project requirements 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 Submission with the Professional, the Using Agency, the Institution and E/A (along with the Department's consultants) will be scheduled by E/A. The conference will normally occur approximately one (1) week after the submission and is held at E/A's office in Harrisburg. The Professional and its consultants must attend.

400.6 CONSTRUCTION MANAGER (CM) AND COMMISSIONING AGENT (CA). When the Department has engaged a Construction Manager or a Commissioning Agent, the Professional is to provide one (1) set of Schematic Submission documents to the CM and/or CA, on the same day the submission is delivered to DGS.

SECTION 401 - SCHEMATIC SUBMISSION DOCUMENTS

401.1 SCHEMATIC SUBMISSION PACKAGE. On the scheduled date of the Schematic Submission the Professional shall deliver the following to the Bureau of E/A:

A. Five (5) copies of the Transmittal Letter, with Schematic Submission Checklist, duly checked and filled out as appropriate.

B. Five (5) copies of the Code Review and Analysis.

C. Five (5) completed copies of Schematic Submission Probable Construction Cost Summary with Project Information Sheets. For blank forms see Exhibits in Chapter 15.

D. Five (5) sets of Design Drawings, including Cover Sheet. See Chapter 8 for the drawing format.

E. Five (5) copies of estimated loads, telephone call reports, and Notification Letters to all Utility Companies (Electric, Gas, Water, Sewer, Telephone, Cable TV, etc. as applicable). Include utility reply letters confirming service, should be included if available. Refer to Chapter 13 for Utility Requirements.

F. Three (3) copies of the Fuel Feasibility Study (with Coal Non-Use Justification). See Chapter 13 for detailed instructions.

G. Three (3) sets of Structural Engineers' Initial Subsurface and Related Site Investigation Reports, and Professional's Request for Proposals for Geotechnical Services. See Chapter 15 RFP details.

H. Three (3) copies of Initial Report on Site Restrictions, including zoning, land development, flood plains, wetlands, hazardous materials, water table, sinkholes, endangered species, easements required, etc.

I. Five (5) copies of List of Regulatory Approvals/Permits – Status Report (See Exhibit in Chapter 15) that the Professional recognizes as necessary for the Project.

J. Two (2) copies of the initial contact letter to Pennsylvania Historical and Museum Commission.

K. Three (3) copies of 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.

L. Three (3) copies of a Report on Current and Anticipated Additional Services, including but not limited to, Property Survey, Geotechnical Investigation, Hazardous Materials Survey, LEED Related Activities, etc.

M. Additional Items, as applicable:

1. Three (3) copies of initial project report for flood control and/or water resources projects.
2. Three (3) copies of initial report of water supply facilities.
3. Three (3) copies of initial report on sewerage facilities.
4. Three (3) copies of other additional items requested by the DGS Project Coordinator, or otherwise determined by the Professional to be required for the Project.

N. All marked-up Programming Submission documents from DGS.

401.2 SITE PLANS. Site plans must include the following information:

A. A small scale Overall Site Plan showing the Project's relationship to surrounding improvements and conditions.

B. Plans of adequate scale to show the work, showing site boundaries, Limit of Contract line, existing and proposed topographic contours, at maximum two (2) foot intervals, proposed and existing structures, vegetation and other site improvements such as roads and parking lots, sidewalks, landscape items, etc.

C. Plans should show all existing and proposed underground and aboveground utility lines, points of attachment to utility lines and point of entrance into buildings (Gas, Water, Sewerage, Steam, Electric Power, Telephone, Cable TV, etc.).

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 or alterations 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 gross square footage must be indicated. 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 sufficient to indicate arrangement, volumes and relationship of spaces.

401.5 MECHANICAL 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.

401.7 PROBABLE CONSTRUCTION COST. The Probable Construction Cost, which must be within 80-90% of the Base Construction amount, shall be submitted on the form provided as an Exhibit in Chapter 15. The estimate is to indicate square foot costs based on current prices. An escalation factor to the mid-point of construction is added separately giving a Total Construction Cost.

401.8 PROJECT INFORMATION FORMS. The Professional must submit completed copies of applicable forms in Chapter 15.

SECTION 402 - REGULATORY APPROVALS

402.1 REQUIREMENTS. The Professional should refer to General Conditions of the Professional Agreement and this Manual, relative to required submittals to applicable agencies in a timely manner.

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 project Coordinator.

402.3 LIST OF REQUIRED PERMITS. With the Schematic Submission, the Professional shall include a list of all required approvals/permits with a schedule of application dates. Use the form included with Exhibits in Chapter 15. Information concerning application documents and other requirements for each approval and permit is to accompany the list.

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. Four (4) copies of the approved application must be submitted with the Construction Documents Submission.

SECTION 403 - APPROVALS AND POST-CONFERENCE ACTIVITIES

403.1 USING AGENCY APPROVAL. The Using Agency's approval must be provided before the Department will approve the Schematic Design. Normally, the Using Agency issues its approval at the review conference. 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 Submission.

403.2 DGS APPROVAL. Official approval is not given at the Review Conference. Schematic Design approval, conditional acceptance, or rejection and instructions for further Project development are issued by E/A in a letter following the Review Conference. As per the General Conditions of the Professional Agreement, 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 Submission by the Department is contingent 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 Schematic Design Stage exceeds 80-90% of the Base Construction amount, the Submission will be rejected and the Professional shall revise the Project scope, size or quality, as approved by the Department.

403.3 MINUTES. The Professional shall furnish minutes of the Schematic Review Conference to the Department, Using Agency and Institution, and Construction Manager/Commissioning Agent (if applicable) within five (5) 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.

403.4 SUBSURFACE AND OTHER INVESTIGATIONS. Immediately after the Schematic 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.

403.5 DESIGN MEETINGS. The Professional shall meet with the Using Agency, as frequently as needed, while developing the project from Schematic Stage to Design Development Stage. These meetings are to obtain the Using Agency's requirements and instructions, resolve planning and program issues, resolve budgetary issues, and ensure that all needs are addressed.

CHAPTER 5
DESIGN DEVELOPMENT SUBMISSION

SECTION 500 - GENERAL

500.1 PURPOSE. The Design Development Submission is to fix and describe the size and character and Estimated Construction Cost of the entire Project as to Architectural, 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 Using 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 E/A. Applicable Design Development Submission documents are to be delivered to E/A on or before the date established in the Agreement, unless another date has been approved by DGS. Delivery may be made in person or by commercial courier.

500.3 SUBMISSION TO USING AGENCY. The Professional is to furnish the Using Agency and Institution with complete sets of Design Development Submission documents as listed below. These sets shall be delivered on the same day delivery is made to E/A.

A. DEP projects – 1 set Main Office, 1 set Regional Office, 1 set Institution.

B. DCNR projects – 1 set Main Office, 1 set Regional Office (if any), 1 set Institution

C. Penn State University projects – 1 set.

D. All other Agency projects – 2 sets Agency, 1 set Institution.

500.4 ENGINEERING PROJECTS. Engineering project requirements 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 Using Agency, the Institution and E/A (along with the Department's consultants) will be scheduled by E/A. The conference will normally occur approximately two (2) weeks after the submission and is held at E/A's office in Harrisburg. The Professional and its consultants must attend.

500.6 CONSTRUCTION MANAGER (CM) AND COMMISSIONING AGENT (CA). When the Department has engaged a Construction Manager or a Commissioning Agent, the Professional is to provide one (1) set of Design Development Submission documents to the CM and/or CA, on the same day the submission is delivered to DGS.

SECTION 501 - DESIGN DEVELOPMENT SUBMISSION DOCUMENTS

501.1 DESIGN DEVELOPMENT SUBMISSION PACKAGE. On the scheduled date of the Design Development Submission, the Professional shall deliver the following to the Bureau of E/A:

A. Five (5) copies of the Transmittal Letter with Design Development Submission Checklist, duly checked and filled as appropriate.

B. Five (5) copies of the Code Review and Analysis, if changed.

C. Five (5) copies of the Design Development Submission Probable Construction Cost Summary with Project Information sheets. For blank forms see Exhibits in Chapter 15.

D. Five (5) sets of Outline Specifications for all prime contracts, with one (1) fully completed specification section.

E. Five (5) sets of Design Drawings, including the Cover Sheet. See Chapter 8 for the drawing format.

F. Five (5) copies of 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.

G. Five (5) copies of List of Regulatory Approvals/Permits – Status Report (See Exhibit in Chapter 15), 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. Also submit copies of reports from previous submission.

H. Three (3) copies of Subsurface Investigation and Geotechnical Report, as applicable (See Chapter 13).

I. Three (3) copies of a Structural Engineer's Report on Selection of Structural and Foundation Systems, including cost comparisons, type, physical size and location of all structural members as applicable, based on the finding of Subsurface Investigation and Geotechnical Report.

J. Two (2) copies of Preliminary Engineering Calculations for HVAC, Plumbing and Fire Protection Systems, including preliminary sizing of major equipment items, systems and utility requirements (water demand, gas demand, waste effluent, electrical load, etc.) and justification of proposed system selection.

K. Two (2) copies of Preliminary Electrical Engineering Calculations, including fault current study, load study, service sizing, emergency/or standby generator sizing.

L. Three (3) copies of Report on Hazardous Material Survey results, with cover letter describing the Professional's proposed solutions.

M. Two (2) copies of the Response Letter from Pennsylvania Historical and Museum Commission.

N. Three (3) copies of 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. Three (3) copies of a Report on Current and Anticipated Additional Services, including but not limited to, Property Survey, Geotechnical Investigation, Hazardous Materials Survey, LEED Related Activities, etc.

P. Additional Items, where applicable:

1. Three (3) copies of final report for Water Resources/Flood Control Projects.
2. Three (3) copies of detailed report on Water Supply Projects.
3. Three (3) copies of final report on Sewerage Facilities.
4. Three (3) copies of other additional items requested by the DGS Project Coordinator, or otherwise determined by the Professional to be required for the Project.

Q. All marked-up Schematic Submission documents from DGS.

501.2 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. Utilities coordination is to be accomplished by showing all utility lines of all Contracts on the Civil Utilities drawing, with all work not by the GS clearly designated as by other specific contractors, with a note to refer to the appropriate HVAC, Plumbing, or Electrical drawings for the work. The Limit of Contract line shall be clearly indicated. The following apply to specific discipline site plans:

A. General Construction Site Plans: Show existing and proposed contours, location of all improvements (existing and proposed), floor elevations, spot elevations at important locations, landscaping scheme, rain water collection and storm water management scheme and interacting of utility lines with site development work, POCs (Pennsylvania One Call) Serial Number, existing conditions and site demolition, staging area, layout, source/date of survey, benchmark locations/description, and soil erosion and sedimentation control.

1. Submit one (1) unbound copy of a Site Plan (as per Paragraph 501.1.f.) for DGS Legal Unit to use for Land Title/Lease Clearance. This drawing must contain:

a. Property lines with metes and bounds, and monument descriptions, where located near Project construction site.
b. Road rights-of-ways adjacent to the Project construction site.
c. Existing easements which are not changed by the Project, and new easements added by the Project.
d. Limit of Contract line encompassing the Work of all Contracts, and providing sufficient clearances for the Contractors to perform the Work and locate staging and parking areas within.
e. After the DGS Coordinator's review/approval, this drawing is to be provided in 11" x 17" format.

B. HVAC Site Plans: The routing and depth of all existing and proposed 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.

C. 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.

501.3 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. See 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 determining preliminary gross-to-net volume and area ratios and the fit of programmed spaces.

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, 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.

501.4 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 submission.

501.5 OUTLINE SPECIFICATIONS. Outline Specifications are to indicate the construction materials and methods to be used. The Outline Specifications should provide the framework upon which the detailed specifications will be built. Chapter 9 has detailed information regarding the specification and Project Manual format. The following notes apply to the outline:

A. Information, back-up material and data are to be included in enough detail to describe the materials and equipment proposed. CSI, Master Format/Section Format, the AIA 'MasterSpec' or similar outline format is acceptable.

B. Outline Specifications are acceptable on white paper. Subsequent submissions shall be on colored paper coded to the different contracts (See Chapter 9 for additional details).

C. Professional must include with the outline specifications, one complete specification section showing the proposed contract specification format.

D. Include a Project Manual Cover Page, List of Drawings, and a complete Table of Contents listing all Divisions and Sections.

E. Include a draft of all applicable Division 1 sections, edited for the Project. (See Chapter 9 for details).

501.6 PROBABLE CONSTRUCTION COST. The Probable Construction Cost, which must be within 80-90% of the Base Construction amount, shall be submitted on the form provided as an Exhibit in Chapter 15. The estimate must include all known items of work, including sitework, demolition, and hazmat remediation, and is to be based on current costs. An escalation factor will then be added to the total, projected to mid-point of construction to provide a Total Construction Cost. The Total Construction Cost estimate shall not exceed the Base Construction amount. If the Statement of Probable Construction Cost furnished with this submission is not within 80-90% of the Base Construction amount, the Professional shall not adjust the design by presenting multiple Base Bids, at this Stage.

501.7 PROJECT INFORMATION FORMS. The Professional must submit completed copies of all other Project Information Forms for Design Development Submission (See Exhibits in Chapter 15).

SECTION 502 - REGULATORY APPROVALS

502.1 REQUIREMENTS. See Chapters 1 and 2. The Design Development Submission is to include a list of Regulatory Approvals/Permits. Use Exhibit in Chapter 15, or similar form. It shall give the current status of all required approvals and permits. 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.

A. PA Department of Labor & Industry preliminary approval is not required, however the Department may arrange a preliminary review at the request of the Professional.

B. Local zoning, land development and other preliminary approvals.

C. PHMC, Bureau of Historical Preservation Review and Recommendation for projects with archaeological and historical significance, including sites.

D. All applicable Federal, State, and Local approvals required.

502.2 DEPARTMENT NOTIFICATION. The Professional must immediately notify E/A 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 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.

503.2 CHARGES. A determination should be made whether or not any charges for providing 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 DGS whether to include the charges in the Electrical or General Contract or whether to negotiate a direct payment by DGS or the Using Agency to the utility company.

503.3 UTILITY AGREEMENTS. The Professional shall consult with DGS Legal and the Project Coordinator 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.

503.4 UTILITY REQUIREMENTS. For detailed instructions regarding utility requirements, refer to Chapter 13.

SECTION 504 - APPROVALS AND POST-CONFERENCE ACTIVITIES

504.1 USING AGENCY APPROVAL. The Using Agency's approval must be provided before the Department will approve the Design Development submission. Normally, the Using Agency issues its approval at the review conference. 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 Design Development Submission.

504.2 DGS APPROVAL. Official 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 E/A in a letter 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 of the Professional Agreement, 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 DGS is contingent on all changes requested or required for further development being incorporated into the design documents. If the Statement of Probable Construction Cost at the Design Development Stage exceeds 80-90% of the Base Construction amount, the Submission will be rejected and the Professional shall revise the Project scope, size or quality, as approved by the Department.

504.3 MINUTES. The Professional shall furnish minutes of the Design Development Review Conference to the Department, Using Agency and Institution, and Construction Manager/Commissioning Agent (if applicable) within five (5) 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.

504.4 SPECIALTY PERMITS. Following Design Development approval, timely application for 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 Using Agency, as frequently as needed, while the Design Development submission is being developed into the final construction documents. These meetings are to gain the Using Agency's final input into final documents, as the detail of the Professional's construction documents are taking finite form.

504.7 CONSTRUCTION REGION COORDINATION. Prior to the Interim Construction Documents Submission, the Professional is to call or meet the DGS Construction Regional Director at the job site, together with a representative of the Using Agency/Institution. The purpose of the meeting is to address construction administration requirements to be included in the contract documents; such items as facilities for Inspectors, temporary services, Contractor laydown/staging areas, parking and other items of interface with the Bureau of Construction. Any items of contention are to be brought to the attention of the Coordinator.

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, mechanical 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 E/A. Interim Construction Documents submission is to be delivered to E/A on or before the date established in the Agreement, unless another date has been approved by DGS. Delivery may be made in person or by commercial courier.

600.3 SUBMISSION TO USING AGENCY. The Professional is to furnish the Using Agency and Institution with complete sets of Interim Construction Documents as listed below. These sets shall be delivered on the same day delivery is made to E/A.

A. DEP projects – 1 set Main Office, 1 set Regional Office, 1 set Institution.

B. DCNR projects – 1 set Main Office, 1 set Regional Office (if any), 1 set Institution

C. Penn State University projects – 1 set.

D. All other Agency projects – 2 sets Agency, 1 set Institution.

600.4 ENGINEERING PROJECTS. Engineering project requirements 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 Using Agency, the Institution, and E/A will be scheduled in E/A's Harrisburg Office approximately two to three (2 -3) weeks after receipt of submission. The Professional and Consultants are required to attend the Conference. 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 Professional is to provide one (1) set of Interim Construction Documents to the CM and/or CA, on the same day the submission is delivered to DGS.

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 following to the Bureau:

A. Five (5) copies of the Transmittal Letter with Interim Construction Documents Submission Checklist duly checked and filled as appropriate.

B. Five (5) copies of 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 Exhibits in Chapter 15.

C. Five (5) copies of Project Specifications (all contracts color-coded and bound together as a Project Manual).

D. Five (5) complete sets of all Construction Drawings, including the Cover Sheet, with the Professional's seals and signatures on all drawings. See Chapter 8 for the drawing format.

E Five (5) copies of List of Regulatory Approvals/Permits – Status Report (See Exhibit in Chapter 15), 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. Also submit copies of reports from previous submission.

F. Two (2) copies of notes from Professional's meeting with Construction Regional Director, indicating the requirements for the General Requirements Section 01040 – Coordination and Control.

G. Three (3) copies of 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. Three (3) copies of 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. Three (3) copies of final project report for flood control and/or water resources projects, if changed.
2. Three (3) copies of final report of water supply facilities, if changed.
3. Three (3) copies of final report on sewerage facilities, if changed.
4. Three (3) copies of other additional items requested by the DGS Project Coordinator, or otherwise determined by the Professional to be required for the Project.

J. Five (5) copies of a written explanation of any revisions requested but not made.

K. All marked-up Design Development Submission documents from DGS.

601.2 PROJECT MANUAL. The Professional must submit a draft of the complete Project Manual, including Cover Page, Table of Contents, List of Drawings, Division 1 – General Requirements, and technical specifications of all contracts. See Chapter 9 for guidelines. Division 1 – 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 add Base Bids, on the forms prescribed in Chapter 15, with a breakdown of estimated construction costs 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 total, projected to mid-point of construction to provide a Total Construction Cost. If the Professional proposes to use a different, but similar, format to the Departments proscribed cost estimate forms, providing a comparable level of detail, the Professional shall submit the proposed cost structure to the Department for written approval, prior to its use. If the Statement of Probable Construction Cost for all Base Bids furnished with this submission are not within the Base Construction amount, the Professional may be required to adjust the design, at no additional expense to the Department to bring the Statement of Probable Construction Cost within the Base Construction amount.

601.5 BASE BIDS. Alternates are not used by DGS. The Professional shall submit a minimum of three (3) add Base Bids, ascending in approximately equal value increments. Each Base Bid shall be provided on a separate Probable Construction Cost Summary form, as prescribed in Chapter 15. Base Bid No. 1 shall be 80-85% of the Base Construction amount. All add Base Bids shall be within the Base Construction amount. These Add Base Bids must be coordinated with and accepted by the Using Agency prior to this submission, and approved by the Department. See Chapter 14 for more information.

601.6 RETURN OF DESIGN DEVELOPMENT DOCUMENTS. With the Interim Construction Documents Submission, the Professional shall return to the Department all the marked-up copies of the Design Development drawings, specifications and comments provided following the previous review conference. A written explanation of any revisions requested, but not made, shall accompany this submission.

SECTION 602 - REGULATORY APPROVALS AND PERMITS

602.1 SUBMISSION REQUIREMENTS. The Interim Construction Documents Submission shall include a List of Regulatory Approvals/Permits (See Chapter 15), indicating the status of the submission/review/approval process for all required permits and approvals list of Regulatory Approval/Permits 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 E/A.

SECTION 603 - APPROVALS AND POST-CONFERENCE ACTIVITIES

603.1 DGS APPROVAL. Official 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 E/A in a letter 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 of the Professional Agreement, 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 DGS is contingent on all changes requested or required for further development being incorporated into the design documents.

603.2 MINUTES. The Professional shall furnish minutes of the Interim Construction Documents Review Conference to the Department, Using Agency and Institution, and Construction Manager/Commissioning Agent (if applicable) within five (5) 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.

603.3 DESIGN MEETINGS. The Professional shall meet with the Using 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 Using Agency's final input into final documents, as the detail of the Professional's construction documents are taking final form.

CHAPTER 7
CONSTRUCTION DOCUMENTS SUBMISSION

SECTION 700 - GENERAL

700.1 PURPOSE. The Construction Documents Submission is to provide 100% complete final construction documents, including drawings and specifications, 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 E/A. Construction Documents submission is to be delivered to E/A on or before the date established in the Agreement, unless another date has been approved by DGS. Delivery may be made in person or by commercial courier.

700.3 SUBMISSION TO USING AGENCY. The Professional is to furnish the Using Agency and Institution with complete sets of Construction Documents as listed below. These sets shall be delivered on the same day delivery is made to E/A.

A. DEP projects – 1 set Main Office, 1 set Regional Office, 1 set Institution.

B. DCNR projects – 1 set Main Office, 1 set Regional Office (if any), 1 set Institution

C. Penn State University projects – 1 set.

D. All other Agency projects – 2 sets Agency, 1 set Institution.

700.4 ENGINEERING PROJECTS. Engineering project requirements 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. If the Department determines that the Construction Documents Submission is adequate for building permit purposes, it will direct the Professional in writing to 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 Using Agency, the Institution, and E/A will be scheduled in E/A's Harrisburg Office approximately three (3) weeks after receipt of submission. The Professional and 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 or a Commissioning Agent, the Professional is to provide one (1) set of Interim Construction Documents to the CM and/or CA, on the same day the submission is delivered to DGS.

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 following to the Bureau:

A. Five (5) copies of the Transmittal Letter with Construction Documents Submission Checklist duly checked and filled as appropriate.

B. Five (5) copies of the Code Review and Analysis, if changed.

C. Five (5) copies of 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 Exhibits in Chapter 15.

D. Five (5) copies of Project Specifications (all contracts color-coded and bound together as a Project Manual), with the Professional's seal and signature on the Cover Page.

E. Five (5) complete sets of all Construction Drawings, including the Cover Sheet, with the Professional's seals and signatures on all drawings. See Chapter 8 for the drawing format.

F. Five (5) copies of 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. Refer to Chapter 13 for Utility Requirements.

G. Five (5) copies of List of Regulatory Approvals/Permits – Status Report (See Exhibit in Chapter 15), 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. Also submit copies of reports from previous submission.

H. Two (2) copies of all previously-submitted Geotechnical Reports, and all other reports, if changed or revised.

I. Three (3) copies of a Letter From the Professional, confirming that the Project design is in compliance with the Geotechnical Consultant's recommendations

J. Two (2) copies of each of Final Engineering Calculations for civil, structural, HVAC, plumbing, fire protection and electrical computations (each discipline bound separately, see Chapter 10).

K. Three (3) copies of a Construction Schedule Bar Chart, with recommended number of calendar days of construction and number of calendar days of temporary heat recommended for the Project.

L. Two (2) copies of proposed RFP for Quality Assurance Inspection and Testing Services, as required during the construction stage of the Project.

M. Framed Professional color rendering, with a CD containing a high-resolution digital picture file of the rendering in an industry standard format, such as PDF.

N. Three (3) copies of 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. Five (5) copies of a written explanation of any revisions requested but not made.

P. Three (3) copies of a letter on the Using Agency's letterhead, addressed to the Director of the Bureau of Engineering and Architecture, and signed by the Using Agency's Secretary, or designee, indicating its formal approval of the Construction Documents.

Q. Additional Items, where applicable:

1. Three (3) copies of final project report for flood control and/or water resources projects, if changed.
2. Three (3) copies of final report of water supply facilities, if changed.
3. Three (3) copies of final report on sewerage facilities, if changed.
4. Three (3) copies of other additional items requested by the DGS Project Coordinator, or otherwise determined by the Professional to be required for the Project.

R. All marked-up Interim Construction Documents Submission documents from DGS.

7**01.2 PROJECT MANUAL.** The Professional must submit the 100% complete Project Manual, including Cover Page, Table of Contents, List of Drawings, Division 1 – 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.

701.3 DRAWINGS. Construction drawings are to be 100% complete dimensioned plans, elevations, sections, details, schedules and diagrams of all architectural, landscaping, civil, 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 seals and signatures must appear on all drawings. Prints for the Construction Documents Submission shall be assembled as follows:

A. The Professional's and respective Consultants' seals and signatures shall be affixed to all drawings.

B. Bind sets as indexed, with Cover Sheet.

C. All approvals from various regulatory agencies shall be noted on Cover Sheet of the drawings.

701.4 FINAL SITE DRAWINGS. Final site development drawings should include the following:

A. General Construction: Small-scale location plans. Existing conditions plan with site demolition. New improvements plan with all surface features indicated and detail cuts. Show Limit of Contract line, and locate staging areas, trailer locations, and Contractor parking areas. Site details of all conditions. Layout plan of new improvements with tie to control monuments, locations of easements and property lines near the work, floor elevations and source/date of survey with location/description of benchmarks. Grading and drainage plan with Stormwater Management system. Profiles of drainage lines with crossover pipes indicated. Common utility plan showing interrelationship of all utilities and the Contractor assigned to each utility and POCs (Pennsylvania One Call) Serial Number. Include a 'Utility Contact Table' as required by Act 287. Landscape plans with details. Soil erosion and sedimentation plans and details with narrative.

B. Other Contracts: Site plan of all work included in each Prime Contract.

C. Multi-Discipline Site Drawings may be used when approved. See Chapter 5 for more information.

D. After approval of the Construction Documents submission, for purposes of Land Title/Lease Confirmation by DGS Legal Unit, the Professional shall provide an electronic file of an 11" x 17" Site Plan, showing all property lines, easements, ROWs, and Limit of Contract line. Verify exact requirements with Project Coordinator.

701.5 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. 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 bound separately.

E. A table of contents, number pages and references to drawings and schedules is to be included.

701.6 PROBABLE CONSTRUCTION COST. The Professional shall provide an updated statement of probable construction cost, with Add Base Bids, on the forms prescribed in Chapter 15, with a breakdown of estimated construction costs 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 total, projected to mid-point of construction to provide a Total Construction Cost. If the Professional proposes to use a different, but similar, format to the Department's proscribed cost estimate forms, providing a comparable level of detail, the Professional shall submit the proposed cost structure to the Department for written approval, prior to its use. If the Statement of Probable Construction Cost for all Base Bids furnished with this submission are not within the Base Construction amount, the Professional may be required to adjust the design, at no additional expense to the Department to bring the Statement of Probable Construction Cost within the Base Construction amount.

701.7 BASE BIDS. Alternates are not used by DGS. The Professional shall submit a minimum of three (3) Add Base Bids, ascending in approximately equal value increments. Each Base Bid shall be provided on a separate Probable Construction Cost Summary form, as prescribed in Chapter 15. Base Bid No. 1 shall be 80-85% of the Base Construction amount. All three (3) required Add Base Bids shall be within the Base Construction amount. These add Base Bids must be accepted by the Using Agency prior to this submission, and approved by the Department. See Chapter 14 for more information.

701.8 RETURN OF INTERIM CONSTRUCTION DOCUMENTS. With the Construction Documents Submission, the Professional shall return to the Department all the marked-up copies of the Interim Construction Document drawings, specifications and comments provided following the previous

review conference. A written explanation of any revisions requested, but not made, shall accompany this submission.

701.9 UTILITY SERVICES. The Professional shall provide a report summarizing the status of all utilities for the Project. 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.

701.10 CONSTRUCTION SCHEDULE BAR CHART. The Professional shall furnish with the submission, on a separate sheet, a bar chart schedule of the envisioned construction sequence (See Exhibit in Chapter 15). This sheet shall indicate the significant construction activities and milestones (including long lead equipment times, etc.), and shall also contain 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.

701.11 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.

701.12 PROFESSIONAL RENDERING. As a component of the Construction Documents Submission, the Professional shall provide to the Department, a matted and framed, colored perspective artist's rendering of the proposed facility. In addition, provide on a CD, a high-resolution digital picture file of the rendering in an industry standard format, such as PDF. The following requirements apply to all (new, addition, or renovation) projects. Any changes to the requirements will be at the sole discretion of the Department.

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 Project Coordinator for his approval).

B. The choices of artistic medium, mat color, and frame for the rendering are the option of the Professional.

C. 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.

D. The rendering shall contain appropriate landscaping, human figures, vehicles, etc., to establish a feeling of scale.

E. Professional shall provide a proof or sketch of the proposed rendering, to the Project Coordinator for approval of the view-angle before proceeding with the final rendering.

F. The rendering shall be appropriately matted, fully framed, and protected with scratch resistant, plastic glazing.

G. The framed 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 name.

701.13 RFP FOR QUALITY ASSURANCE. Provide copies of the proposed RFP for Quality Assurance Inspection and Testing Services for Department's review and approval. The RFP shall include a complete description of the scope of the QA Inspection and Testing Services to be required for the construction stage of the Project. (See Chapters 13, 14 and 15 of this Manual).

SECTION 702 - REGULATORY APPROVALS AND PERMITS

702.1 CONSTRUCTION/BUILDING PERMITS. The Professional shall obtain UCC Building Permit from the Department of Labor and Industry. The Department requires the Contractor obtain and pay for all other necessary permits, licenses and certificates required by law for proper execution and completion of its work.

702.2 SUBMISSION REQUIREMENTS. The Construction Documents Submission is to include a list of Regulatory Approval/Permits updated from the Design Development Submission to give current status of all required approvals and permits. Copies of all approvals and permits obtained, and all applications submitted, that were not previously furnished must be included. Also submit copies of reports from previous submission.

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 E/A.

SECTION 703 - APPROVALS AND POST-CONFERENCE ACTIVITIES

703.1 USING AGENCY APPROVAL. The Professional should be certain that the Construction Documents have the 'informal' approval of the Using Agency, before the Construction Documents Submission to DGS. The Professional must obtain the Using Agency's formal approval of the Construction Documents in the form of a letter to the Director of the Bureau of Engineering and Architecture, signed by the Using Agency's Secretary, or designee, with approval authority. This letter is required following the Construction Documents Review Conference, and prior to DGS Final Approval.

703.2 DGS APPROVAL. Official approval is not given at the Review Conference. Construction Documents Submission approval, conditional acceptance, or rejection is issued by E/A in a letter following the Review Conference. Refer to Chapter 1 for more detailed instructions on how to proceed. 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 of the Professional Agreement, the Professional shall only invoice up to 90 % of the portion of the Professional fee applicable to the Construction Documents Stage. The balance of the Professional's fee for the Construction Documents Stage will not be paid until the Department's receipt of the Professional's signed Commitment Letter to incorporate the final comments into the final documents.

703.3 MINUTES. The Professional shall furnish minutes of the Construction Documents Review Conference to the Department, Using Agency, Institution (as well as Construction Manager and Commissioning Agent, if applicable) within five (5) 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.

CHAPTER 8
DRAWINGS

SECTION 800 - GENERAL

800.1 PURPOSE. This Chapter presents standards and guidelines for 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. The standards and guidelines apply to the construction contract drawings. Prints for the review submissions are to follow these same standards. All drawings used for DGS review, bidding and construction shall be printed on standard weight bond paper.

800.3 WORKING DRAWINGS. Original drawings may be hand-drawn or CADD-generated drawings. If hand-drawn, ink or pencil may be used. Line and lettering must be dark and large enough for microfilm 1/2 size reproduction. Lettering must be a minimum 3/32" height, and be legible on half-size prints. Signatures and code approvals must be in permanent ink. Except where drawings are diagrammatic, all drawings shall be drawn to scale.

800.4 'AS-BUILT' RECORD DRAWINGS. Record drawings of the construction shall adhere to the industry standard for 'As-Built' Record Drawings on archivable polyester drafting film, in accordance with Professional Agreement.

800.5 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 construction drawings shall contain adequate information, including schedules, details and pertinent information necessary to perform the work.

800.6 DRAWING COORDINATION. The Professional must exercise care to ensure that there is thorough coordination of the Contract 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, resulting in a monetary assessment against the Professional.

SECTION 801 - SIZE, FORMAT AND APPROVALS

801.1 DRAWING SIZE. Prints for review submissions may be a minimum readable size of 18" x 24" up to a maximum of 30" x 42". Drawings for bidding, and 'As-Built' Record Drawings submissions are to be 30" x 42". Projects for DEP shall be 24" x 36".

801.2 COVER SHEET. All projects shall have a Cover Sheet. The Cover Sheet shall adhere to the standards above and in Chapter 15. The Index to Drawings shall list 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 individual drawing sheets shall be as shown in the Exhibits in Chapter 15. The Professional must submit proposed title blocks, with names and titles, to the Bureau for approval as a component on the drawings at the Schematic Submission.

801.4 PROFESSIONAL SEAL AND SIGNATURE. For the Interim Construction Documents Submission and the Construction Documents Submission, the Professional Seal of the Registrant in charge of the work must appear on all drawings, specifications, plats and reports issued by the Professional. The Architect's Seal must appear on the architectural drawings, the Engineer's Seal must appear on the engineering drawings, etc. An embossed seal, a stamp of a design identical to the seal, or a reproduction of a stamp identical to the seal, may be used with the Registrant's signature applied near or across the seal.

801.5 KEY PLAN. The Professional must include a Project Location Plan, 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.

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
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. Use of other designations or AIA Standards as may be used with Coordinator's approval.

802.2 DRAWINGS. All work of each Prime Contractor shall be shown on the drawings for that particular contract. All drawings serve as reference drawings for all Contractors.

802.3 MULTI-DISCIPLINE DRAWINGS. Drawings showing work of more than one (1) 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, both on the Drawing Cover Sheet and the Project Manual List of Drawings. Multi-discipline drawings shall only be used in exceptional cases where substantial duplication of drafting can be avoided by their use. Notes on multi-discipline drawings are to be addressed to specific contractors.

802.4 ASSEMBLY. Drawings of all contracts shall be bound together in the bidding sets, so that bidders receive all the Project drawings, in order to understand the interface and coordination of the prime contracts. If the drawing set is divided into more than one volume, all volumes must have the cover sheet.

SECTION 803 - SYMBOLS, REFERENCES AND SCHEDULES

803.1 SYMBOLS. A Legend showing all reference symbols and abbreviations with a clear explanation of each must be provided. 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 the following reference standards 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.

A.	Ramsey/Sleeper -	Architectural Graphic Standards
B.	Time-Saver Standards for Architecture -	Design Data
C.	ASHRAE -	HVAC reference
D.	SMACNA -	Sheet Metal reference
E.	AIA Standard -	Numbering Drawings

803.3 SCHEDULES. The Department has no standard format for schedules. 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 or model numbers in the schedule unless permitted by the Department. Show these names and numbers in the appropriate specification sections. Schedules shall include, but are not limited to:

A. Door schedule, indicating door type, frame type, threshold, hardware set, and rating.

B. Finish schedules, indicating each wall, floor, ceiling, base, etc., with an integral or separate color schedule.

C. Window schedule.

D. Lintel schedule.

E. Hardware schedule shall be in the hardware specification of the Project Manual.

F. Beam and column, and other structural member schedules with design and construction loads and information.

G. Caisson and pile schedules with design and construction information, anticipated bearing elevations and loads.

H. Fixture schedules (all contracts), including design conditions, size of service connections. Fixtures must be identified on the drawings.

I. Equipment schedules (all contracts), including design conditions, size and capacity, motor horsepower and all electrical characteristics.

J. Electrical panel schedules.

SECTION 804 - MISCELLANEOUS

804.1 AS-BUILT CHANGES. At completion of the Project, record 'As-Built' conditions on the polyester Record Drawings, and identify 'As-Built' changes using symbol and description key on the standard title block.

804.2 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. See Exhibits in Chapter 15. Location of actual plaque shall be shown on the Drawings.

804.3 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.

804.4 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.

804.5 HVAC, PLUMBING AND ELECTRICAL DRAWING REQUIREMENTS. The following guidelines are to be used with accommodation for conditions of specific projects. HVAC, Plumbing and Electrical drawing criteria should be similar.

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 shall be considered a part of the specifications.
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 all fire extinguisher cabinets.
6. Show all sprinkler head locations.
7. Show all fire protection systems in the building.
8. 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. Mechanical, 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, installed 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. See Chapter 15.

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.

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 Project Manual which consists of the Project Manual Cover Page, Bidding and Contract Documents for All Contracts, General Requirements, and the Technical Specifications for each contract.

900.2 PROGRAMMING AND SCHEMATIC SUBMISSIONS. Specifications are not required with these submissions. The Project Information Forms and the Drawings will sufficiently indicate the intent of the design. See Chapter 3 and 4 for more information.

900.3 DESIGN DEVELOPMENT SUBMISSION. "Outline Specifications" are to be part of the Design Development Submission. Refer to Chapter 5 for more information.

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

900.5 CONSTRUCTION DOCUMENTS SUBMISSION. Final specifications, bound into 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 must be used for all contracts. The Table of Contents should be approved during the Design Development Review. See Chapter 5 for more information. The preferred format is CSI Master Format/Section Format. The AIA 'Master Spec' or similar formats are acceptable, all as adapted for DGS separate prime contracts and indexed as described in this Chapter and in Chapter 14, as approved. Any other format except 16 Division format must be approved by DGS.

901.2 FORMAT. Project Manual shall comply with the following:

A. 8-1/2" x 11" page size – printed both sides.

B. Bind on the left side with a plastic or metal, spiral or comb binder, which will allow the Project Manual to lie flat, when open.

C. All contracts must be bound together in a single Project Manual with one Table of Contents covering all contracts. If the thickness exceeds 1-1/2", bind the Manual in multiple volumes. Break up the volumes in complete prime contract divisions, and include the Cover Page and Table of Contents in each volume.

D. Project Manual Divisions shall be color-coded by contract:

1. Table of Contents, List of Drawings, and all items prior to and including, Division 1 General Requirements Sections – White
2. General Construction Sections – Green
3. HVAC Construction Sections – Pink

4. Plumbing Construction Sections – Blue
5. Electrical Construction Sections – Yellow
6. Other Miscellaneous Contracts – Orange, Gray or any other color than above.

E. The Project Number shall be on lower left corner of White pages. (e.g., DGS 406-53 Phase 1 or DGS 406-53 Phase 2)

F. The Contract Number shall be on lower left corner of color-coded pages. (e.g., DGS 406-53 Phase 1.1, or DGS 406-53 Phase 1.2, or DGS 406-53 Phase 1.3, or DGS 406-53 Phase 1.4)

G. Page Numbers shall be on the lower right corner or lower center of all pages. (e.g., 01400-1)

H. All paragraphs and subparagraphs must be numbered or lettered in outline form.

I. Table of Contents must indicate applicable construction contract numbers. See sample Table of Contents in Chapter 15.

J. List of Drawings must indicate applicable construction contract numbers. See sample List of Drawings in Chapter 15.

K. Refer to the sample Project Manual Cover Page in Chapter 15.

SECTION 902 - PROJECT MANUAL DOCUMENTS AND BINDING ORDER

902.1 LIST OF FRONT END DOCUMENTS. The Bidding and Contract Documents applicable to all contracts are to be bound into a Project Manual in the order as listed below:

A. Project Manual Cover Page

B. Notice to Bidders

C. Table of Contents

D. Instructions to Bidders

E. Form of Agreement

F. Contract Bond

G. General Conditions of Contract

H. Prevailing Minimum Wage Predetermination

I. Special Conditions

J. List of Drawings

902.2 LIST OF DIVISION 1 – GENERAL REQUIREMENTS SECTIONS. The General Requirements sections are standard to all DGS projects, and are applicable to all prime contracts.

A. Division 1 sections are available on the DGS Internet web site, and include the following:

1. Section 01010 - Summary of Work
2. Section 01025 - Unit Prices in Lump Sum Contracts **[if applicable]**
3. Section 01026 - Unit Price Contracts **[if applicable]**
4. Section 01027 – Explanation of Contract Method Including Unit Price Work **[if applicable]**
5. Section 01030 - Base Bid Descriptions
6. Section 01040 - Coordination and Control
7. Section 01050 - Coordination Drawings **[if applicable]**
8. Section 01110 – Dept. of Corrections - Supplemental Provisions **[if applicable]**
9. Section 01115 – Dept. of Public Welfare - Supplemental Provisions **[if applicable]**
10. Section 01120 - PHMC Projects-Supplemental Provisions **[if applicable]**
11. Section 01310 - Sequence of Construction & Milestones
12. Section 01400 - Quality Control Testing Services
13. Section 01401 - Quality Assurance Testing and Inspection Services
14. Section 01450 - Contractor's Qualification **[if applicable]**
15. Section 01500 - Temporary Utilities

B. Chapter 14 contains instructions regarding Division 1 - General Requirements sections. The Professional must carefully examine the General Requirements sections, editing as required for each particular project and adding items appropriate to the Project. The basic provisions and wording of the Division 1 Sections reflect DGS policy. These provisions are to be changed only with the Project Coordinator's approval. Deviation from DGS Policy and Procedures is not acceptable.

C. 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 cannot be changed without approval of DGS.

902.3 LIST OF TECHNICAL SPECIFICATIONS SECTIONS. Technical Specification Sections for all prime contracts, typically shall be as follows:

A. General Construction Contract (.1)

1. Division 2 – Site Construction, through Division 14 – Conveying Systems
2. Division 17 – Hazardous Materials

B. Heating, Ventilating and Air-Conditioning Construction Contract (.2)

1. Division 15A - Heating, Ventilating & Air-Conditioning

C. Plumbing Construction Contract (.3)

1. Division 15B - Plumbing

D. Electrical Construction Contract (.4)

1. Division 16 - Electrical

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 provided in Chapter 15 of this Manual. For the Interim Construction Documents Submission and the Construction Documents Submission, the Professional Seal of the Registrant in charge of the work must appear on the Cover Page of the Project Manual.

903.2 NOTICE TO BIDDERS. This document will be prepared by the DGS Bidding Unit, of the Bureau of Professional Selections and Administrative Services (BPSAS), and will be issued to the Professional for insertion into the Project Manual, prior to printing for bidding.

903.3 TABLE OF CONTENTS. This document is to be prepared by the Professional, in conformance with the sample Table Of Contents provided in Chapter 15 of this Manual.

903.4 INSTRUCTIONS TO BIDDERS, FORM OF AGREEMENT, CONTRACT BOND, GENERAL CONDITIONS OF CONTRACT. These documents will be prepared by the DGS Bidding Unit, of the Bureau of Professional Selections and Administrative Services (BPSAS), and will be issued to the Professional for insertion into the Project Manual, prior to printing for bidding.

903.5 PREVAILING MINIMUM WAGE PREDETERMINATION. This document will be obtained from the Pa. Department of Labor and Industry the DGS Bidding Unit, of the Bureau of Professional Selections and Administrative Services (BPSAS), and will be issued to the Professional for insertion into the Project Manual, prior to printing for bidding.

A. Certain DGS projects which have federal funding will utilize federal wage rates, as dictated by the Davis-Bacon Act. This document will be obtained from the federal government the DGS Bidding Unit, of the Bureau of Professional Selections and Administrative Services (BPSAS), and will be issued to the Professional for insertion into the Project Manual, prior to printing for bidding.

903.6 SPECIAL CONDITIONS. These are standard DGS documents, and will be issued by the Bidding Unit, of the Bureau of Professional Selections and Administrative Services (BPSAS) to the Professional for insertion into the Project Manual, prior to printing for bidding.

A. The Special Conditions section of the specification amends and supplements the Instructions to Bidders and the General Conditions of Construction Contract (standard documents provided by DGS).

B. The standard Special Conditions documents of DGS are to be amended or superceded only when mandated by circumstances peculiar to the project and as directed by the Department. Deviations from DGS's standard procedures for the convenience of the Professional are not acceptable.

C. Supplementary provisions to be incorporated into the Special Conditions may be provided by the Department during any Design Stage.

903.7 LIST OF DRAWINGS. This document is to be prepared by the Professional, in conformance with the sample List of Drawings, provided in Chapter 15 of this Manual.

SECTION 904 - INSTRUCTIONS ON DIVISION 1, GENERAL REQUIREMENTS

904.1 INSTRUCTIONS. These documents are to be prepared by the Professional. All Division 1 sections must be obtained from the DGS website, and edited to suit each particular project.

A. Not all the standard Division 1 Sections apply to every project. Discuss the list of Division 1 sections with the DGS Project Coordinator, to determine which sections are applicable to the particular Project.

B. Don't repeat in Division 1 Sections items already addressed in the General Condition of the Contract for Construction.

B. Edit applicable Division 1 Sections only as necessary to suit the specific Project. Do not change the intent of the sections.

C. Discuss with the Project Coordinator before writing additional Sections for Division 1. If additional sections are necessary, take care not to create conflicts with the General Conditions of the Contract for Construction.

D. The list of requirements in Section 01040 – Coordination and Control must be discussed with the appropriate Regional Construction Director and the Project Coordinator, before it can be edited by the Professional.

E. See Chapter 14 of this Manual for additional instructions regarding Division 1 – General Requirements.

F. On projects for which the Using Agencies have special requirements, include approved Using Agency generated specification sections in Division 1, General Requirements, as requested.

SECTION 905 - INSTRUCTIONS ON TECHNICAL SPECIFICATIONS

905.1 STANDARD SPECIFICATIONS. Commercially available pre-written generic specifications by CSI or AIA Master Spec or similar are acceptable with certain editing modifications. Use the latest available edition. All paragraphs and subparagraphs must be numbered. DGS Standard Specification Requirements are referenced in Chapter 14. These must be incorporated into the contract specifications, as applicable.

905.2 EDITING. Specifications are to be created to suit the requirements of each individual project. Professionals using a standardized specification shall edit their specifications to exclude all non-pertinent 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.

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

1.1 STIPULATIONS

A. The specifications sections "General Conditions of Contract", "Special Conditions" and "Division 1 - 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 should not be used without specific written approval. See Chapter 2 of this Manual.

905.5 PERFORMANCE SPECIFICATIONS. Unedited manufacturer's performance specifications should not be used for standard items. Specify the product along with at least three (3) acceptable manufacturers, and their catalog numbers, of equal products to establish a standard of quality, appearance and function for the required item. Avoid designs using items common to just one manufacturer.

905.6 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 applicable text from the standard in the specification. Provide copies of specific portions of applicable referenced standards/codes to the Bureau of Construction, when requested.

905.7 TRADE NAMES. Trade names are to be used only to establish a standard of quality, appearance, design and function whenever possible. At least three (3) manufacturers' products should be listed with the clause "…or equal as approved by the Professional". In the event that three "equal" manufacturers cannot be found, two (2) named manufacturers will suffice. Specify the manufacturer's name and model number in each case. Trade names are not to appear on the drawings. For requirements regarding approved equals or substitutions, and use of trade names, refer to Article 19 of the General Conditions to the Construction Contract, and to Chapter 9 of this Manual.

905.8 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 Department 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.

905.9 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.

905.10 QUALITY CONTROL TESTING. Quality control tests to be done by the Contractor are to be included in Section 01400 of the Project Specifications. See the requirement for coordination with Quality Assurance Services by the Professional in Chapter 13.

905.11 QUALITY ASSURANCE TESTING AND INSPECTION. Testing and inspection services by the Professional shall be done as required by the Department and by Code, under a Work Order. All testing decisions must be coordinated with the DGS Project Coordinator. Testing and inspection services required shall be listed in Section 01401 of the Project Specifications. See detailed requirements for Quality Control and Quality Assurance Testing in Chapter 13.

905.12 BASIC CODES/REGULATIONS. Reference to an edited list of the latest edition of design codes 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. Labor & Industry – Uniform Construction Code (UCC)

C. Pennsylvania Code – Department of Health regulations

D. National Electrical Code – NFPA 70

E. National Electrical Safety Code – ANSI C2

F. ASHRAE

G. Pennsylvania Code – Elevators, lifts, escalators, dumbwaiters, hoists and tramways – Labor & Industry 34 Code Chapters 7 and 8

H. Safety Code for Elevators and Escalators – ASME/ANSI A 17.1

I. Accessibility Codes - UCC

J. City or Local Municipal Codes

SECTION 906 - RECOMMENDED SPECIFICATION PARAGRAPHS

906.1 GENERAL. Chapter 14 contains specific paragraphs and/or instructions for use in preparing the required specifications. 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 INSTRUCTIONS TO BIDDERS AND GENERAL CONDITIONS. The Project Manual for the Construction Documents Submission shall not include the Instructions to Bidders, the General Conditions, or other front-end documents listed in this Chapter (except for the Table of Contents and the List of Drawings). The Table of Contents of the Project Manual should indicate these documents with the page numbers blank until the number is known. The front-end documents will be provided to the Professional by the DGS Bidding Unit, after bid dates are set.

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 through survey of current conditions prior to start of design for all Architectural and Engineering disciplines.

1000.2 BUILDING LIFE EXPENTANCY. 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 SSHE 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 DGS Project Coordinator.

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 14 for DGS standard provisions and specification requirements.

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 each 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 sloped insulation.

B. Roof drains are to be 4" minimum, unless justified otherwise, and are furnished and installed by the General Contractor. Rainwater conductors, including connection to the drain, are by the Plumbing Contractor. Insulation of the roof drain is by the Plumbing Contractor along with the RWC insulation.

C. Provide secondary drainage system as required by Code.

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 drain system, the ponded water load should be included in the live load.

1001.5 BUILDING JOINTS. Expansion 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 Industry (AWI) are to be used for designing and specifying custom woodwork, cabinetry and finish carpentry.

1001.7 WINDOWS. The standards of the Architectural Aluminum Manufacturers Association 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 FINAL CONNECTIONS OF EQUIPMENT. The General Contractor furnishes and installs architectural equipment including kitchen, laboratory, hospital and laundry equipment. Rough-in of all services is installed by the HVAC, Plumbing and Electrical Contractors, as applicable, from "rough-in" shop drawings, approved by the General Contractor and Professional. The following shall be accomplished:

A. The Professional shall coordinate the final connection requirements between the drawings and specifications of all trades. The lack of coordination in specifications and drawings between contracts is the most frequent cause for Change Orders.

B. The General Contractor shall include furnishing, installing and connecting of all service lines (waste, vent, water, air, vacuum, gas, drain, steam and condensate) from fixtures

within the manufactured equipment package, through, under or along the backs of working surfaces to the point of final connections

C. 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.

D. Rough-ins shall be stubbed at least 8" above floor, out of walls or down from ceiling, and pressure lines valved (waste lines capped), unless shown otherwise for particular reasons.

E. Final connections to all plumbing services shall be done by the Plumbing Contractor.

F. Final connections on ventilating ductwork for exhaust systems and steam and condensate connections are to be done by the HVAC Contractor.

G. 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.

1001.9 LIGHTING USE. Standards of design for illumination shall be Lumens Per Watt for equipment selection, except where special effect is sought.

1001.10 FIRE EXTINGUISHERS. Fire extinguishers needed for occupancy of the Project (whether in cabinets or loose) 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 the National Board of Fire Underwriters' and shall bear the UL label.

1001.11 PROVISIONS FOR FUTURE RADON PROTECTION. In order to be able to retrofit any building that has a radon problem with a remediation system in the future, all new buildings should include minimal-cost features that make it possible. 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. Seal or detail slabs for future sealing of all joints and penetrations, including the perimeter. Include a suction void and stubbed up vacuum exhaust pipe for future connection.

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. If a stone layer is installed under the vapor barrier, a future vacuum exhaust system can be installed.

D. HVAC systems should be designed to provide a positive pressure throughout the building.

E. Radon testing should be included in the air quality testing after the building is enclosed and nearly ready for occupancy.

SECTION 1002 - CIVIL/STRUCTURAL

1002.1 CIVIL. Site design shall be by a Civil Engineer Registered in the Commonwealth of Pennsylvania. Comply with all codes, and federal, state and local regulations and obtain required design approvals. Information 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 or preferably three benchmarks and indicate the source 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 Contract Limit Line and the Contractor staging and parking areas.
3. Grading and drainage with existing and new contours or point grades to allow construction. Show stormwater management system. Show all drainage structures with invert and top elevations; provide profiles with pipe 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 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 2 for work (such as concrete paving) which is a sub-category of the main category subsequently specified (Concrete, in Division 3) they shall be fully coordinated, so that requirements of the main specification are required by reference.

1002.2 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. Commonwealth office buildings 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. Specifications, not the drawings, are to contain testing requirements. Tests and inspections to occur are to be listed in Sections 01400 and 01401, not the technical sections. See Chapters 13-15 for instructions and details.

D. Performance-Specified Structural Systems: If a structural system or component is selected where the manufacturer or contractor (hereafter referred to as "manufacturer") does the design instead of the Project structural engineer, it must meet the following criteria:

1. 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.
2. The Professional may base his 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.
3. 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.
4. 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. His approval need not be based on more analysis than he deems necessary to make this statement.
5. Where there is an industry association which exercises quality control over its members, membership should be required.
6. The manufacturer's design engineer must be licensed in the Commonwealth of Pennsylvania.
7. 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.
8. If the system is a complete building system, the specified system and its equals must be available to all bidders.
9. The design of cold-formed studs and joists and other materials manufactured universally according to industry standards shall be by the Professional..

E. Metal Stud Bearing Walls: DGS policy does not allow Commonwealth buildings to be constructed with metal stud bearing walls.

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.

SECTION 1003 - HEATING, VENTILATING AND AIR-CONDITIONING

1003.1 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 14 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 with 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.

1003.2 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. See Chapter 2 for boiler fuel requirements.

B. 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.

C. 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.

D. 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.

E. Properly support all piping to permit expansion and contraction.

F. 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 on each side of the device.

G. Connections to pumps, circulator, hot water heater and all other equipment which may require servicing or replacement shall be provided with a union on each side of the device.

H. Insulate all heating and cooling system pipes within the building with the minimum thickness as prescribed by the Thermal Insulation Manufacturers Association (TIMA). Pipe insulation and covering shall have a flame-spread rating not exceeding 25 and a smoke-developed rating not exceeding 50.

1003.3 COAL-FIRED BOILERS. Coal fired boiler plants shall be fully equipped to provide for all coal and ash handling equipment, control panels, water treatment system and all other associate appurtenances.

A. File Permit application with DEP and other regulatory agencies prior to Preliminary Submission.

B. Provide appropriate equipment to conform to the requirements of DEP – Air Quality and Waste Management codes and regulations, in addition to the requirements of the Department of Labor & Industry Boiler Division.

C. The Boiler Capacity and Performance Test Procedure Guide appears in Chapter 14. The boiler test is under the supervision of the Professional and boiler operator personnel. The Institution provides the fuel for the test. See Chapter 15 for Boiler System Test Reports.

1003.4 INCINERATORS. Incinerators used for burning of trash or medical waste shall conform with the requirements of DEP, and/or the local Health Department. File permit application with DEP and other regulatory agencies prior to the Design Development Submission.

1003.5 TESTING, ADJUSTING AND BALANCING (TAB) AGENCY. The services of a qualified TAB agency shall be provided by the HVAC Contractor. Such agency shall have in its employ a Professional Engineer registered in Pennsylvania. The TAB agency 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 dates 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 14 for additional information, and additional requirements due to Commissioning Agents, if applicable.

1003.6 REFERENCE CODES AND STANDARDS. All codes and standards applicable to design, installation and material requirements shall be of the latest date of issue.

1003.7 GEOTHERMAL HVAC SYSTEM DESIGN. To insure 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 somewhere 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.

SECTION 1004 - PLUMBING

1004.1 GENERAL. The design and installation of plumbing systems, including sanitary and storm drainage, sanitary facilities, water supply, storm water and sewage disposal, shall comply with the requirements of Pennsylvania UCC and/or local municipal plumbing codes, whichever is the more stringent.

1004.2 SCOPE. The work of the Plumbing Contract (.3) is generally limited to within a point five (5) feet outside the building.

1004.3 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. Provisions for lavatories for people with disabilities shall comply in number, position and fixture type, with all applicable codes.
3. The minimum number of fixtures. For the percentage of men and women occupants consult with the Using Agency. Unless otherwise required for particular building

types, the number of fixtures for each toilet room shall conform to applicable codes. In places of assembly, the number of fixtures shall be provided so that waiting time for use of the restroom facilities shall not be greater for women than for men.

4. All toilet and bathroom accessories, such as toilet paper holders, towel racks and mirrors shall be provided by the General Contractor.

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^{o}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.

1004.4 REFERENCE CODES. All codes and standards applicable to design, installation and/or material requirements shall be the latest date of issue. Basic references are:

IPC	International Plumbing Code
ANSI	American National Standard Institute
ASSE	American Society of Sanitary Engineering
ASTM	American Society of Testing and Materials
MSS	Manufacturers Standardization Society of Valves and Fitting Industry
PDI	Plumbing and Drainage Institute
ASME	American Society of Mechanical Engineers

SECTION 1005 - ELECTRICAL

1005.1 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 Electric Code (NEC), latest edition, and the Uniform Construction Code (UCC), whichever is more stringent.

1005.2 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%.

C. Voltage drop in branch circuits shall not exceed 3%.

D. All specified equipment shall be designed to safety interrupt and/or carry the available fault current at the equipment.

E. Energy conservation shall be a prime consideration in all design. Dry type transformers shall be rated 150^{o}C with 80^{o}C rise.

F. 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.

G. Set screw fittings are not acceptable on Electrical Metallic Tubing (EMT) – use compression fittings.

H. Specify security screws where required.

I. Specify 10% spare breakers in all panels where economically feasible.

J. Provide 15% provisions for installation of future breakers (not just space) in all panels.

K. Panelboard schedules shall include raceway and wire size and equipment ratings.

L. Conduct a thorough survey of existing conditions.

M. Coordinate electrical layouts and plans with layouts and plans of all other design disciplines.

N. Conduit measuring tape shall be included in all empty conduits.

O. Specify methods of controlling spread of fire and smoke. Specify fire-rated sealants and 'poke through' fittings.

P. Emergency lighting levels shall be in accordance with the UCC requirements.

Q. Maintain adequate working space around and in front of all electrical equipment.

R. Do not attach any electrical items to the metal roof deck.

S. If permission is given to run conductors exposed, specify that they shall be attached firmly to the building structure. They are not to be allowed to lie on the suspended ceiling.

T. Provide resistance heater strips in outside housed switchgear.

1005.3 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.

SECTION 1006 - VERTICAL TRANSPORTATION

1006.1 REQUIREMENTS. Elevator, escalator, dumb-waiter, chair lift, etc. design shall comply with all applicable codes, regulations and engineering standards.

1006.2 MINIMUM DESIGN CRITERIA. Vertical transportation design shall meet or exceed the following criteria:

A. Car sizes and speeds to comply with Using Agency requests and applicable codes.

B. Light, switch and receptacle to be provided in all elevator pits. Coordinate with Electrical Contract design.

C. Provisions for a sump to be made in all elevator pits. Coordinate with General, Plumbing and Electrical Contract designs.

D. Hole-less elevators are not to be specified without special permission.

E. Roller guides, not slide shoes, are to be specified.

F. Planed "tee" rails are to be specified, round rails are not acceptable.

G. Smoke detectors are to be installed at the top of each elevator shaft, in each elevator machine room, and in elevator lobbies.

H. Smoke detectors are to be tied to the building fire alarm system.

I. Fireman's control shall be provided where required by code.

J. Telephones shall be provided in all passenger elevators.

K. Physically handicapped accessibility standards shall be met.

L. Elevators shall be connected to normal and emergency power in all hospitals, health care facilities, office buildings, and other buildings where required by code.

M. Emergency power, where not required by code, may be provided to elevators upon request of the client agency, subject to budget constraints.

N. Provide hoist beams in all elevator shafts – coordinate with structural engineer.

O. Provide backup system lowering devices in hydraulic elevators not connected to emergency standby power.

P. Provide emergency lighting in all elevator cabs.

Q. Provide ladders in elevator pits (coordinate with General Construction design).

R. Provide heating and ventilation in all elevator machine rooms, and cooling when equipment requires. Coordinate with other Prime Contract designs.

1006.3 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.

1006.4 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

1100.1 INTRODUCTION. The Construction Procurement Stage encompasses the activities from E/A 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.

1100.2 ADMINISTRATION. The Bureau of Professional Selections and Administrative Services (BPSAS) is the primary DGS project administrator during the Construction Procurement Stage. Its Project Administration Division is the contact point for bidding schedule, issuing documents and other administration activities. BPSAS will send bidding instructions (See Chapter 13) to the Professional with its authorization to proceed with the Construction Procurement, generally after making telephone contact. Consult the Project Coordinator on all matters of design, construction contracts and bidding requirements.

1100.3 PROCESS. The Professional reproduces and distributes the bid documents to the bidders. The BPSAS will designate the construction period and advertise the project on the DGS Internet website (www.dgs.state.pa.us) . The major steps in the Construction Procurement stage are listed below.

A. E/A notifies the Professional that the Construction Document Submission is approved.

B. After all approvals and permits are obtained, E/A clears the Project for funding and bidding, and notifies BPSAS.

C. BPSAS requests Budget Office for release of funds, for authorization to bid.

D. Budget Office releases funding.

E. BPSAS establishes the date for Bid Issue, as well as the date, time and place for the Pre-Bid Conference and the Bid Opening, with the Professional. BPSAS also establishes the Plan Deposit amount, with the Professional. At this time, the Professional must send the polyester Cover Sheet to the Project Coordinator for the Director's signature.

F. BPSAS obtains the Prevailing Wage Rates, prepares the Proposal Forms, and the Notice to Bidders.

G. BPSAS mails to the Professional, the signed Cover Sheet, copies of Bid Bond, Financial Questionnaire Forms and Bid Proposal envelopes, Notice to Bidders, Wage Rates, Proposal Forms, Instructions to Bidders, Form of Agreement, General Conditions and Special Conditions.

H. BPSAS advertises the Project for bidding, on the DGS website.

I. The Professional responds to bidder inquiries, prints and distributes documents, and issues Bulletins.

J. Professional solicits proposals for Quality Assurance and Hazmat Monitoring services.

K. The Department receives and opens bids.

L. Professional and the Department evaluate the bids.

M. The Department awards contracts or rejects bids, as applicable.

N. If bids are rejected and rebidding is required, the Department will provide instructions to the Professional.

SECTION 1101 - SCHEDULE

1101.1 GENERAL. The bidding and construction completion dates in the Professional's Agreement are tentative. Actual dates are established by the Department during the Construction Procurement stage. The actual dates are dependent upon the Professional's recommendation (see Recommended Days of Construction, Chapter 7), the 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 BPSAS after receiving Budget Office authorization to bid. The Professional is consulted to assure sufficient time is allowed for printing the bid documents prior to advertising. BPSAS places advertisements on the DGS Internet website. The bidding period is generally 4 to 5 weeks.

1101.3 PRE-BID CONFERENCE. The Professional must advise E/A of the need for a Pre-Bid Conference at the Construction Documents Submission. E/A will make the final decision, considering the Professional's and Agency's recommendations, and advise BPSAS of the need for a Pre-Bid Conference. BPSAS will coordinate the date and location for the Pre-Bid Conference with the Using Agency and Professional. The date and location of the Pre-Bid Conference appear in the Notice to Bidders and the advertisements.

1101.4 BID OPENING. BPSAS sets the Bid Opening Date, Time and Place based on the project complexity and other projects scheduled for bidding. Only BPSAS can change the Bid Opening Date. The Professional shall advise the Bidding Section of all circumstances, any time during the Construction Procurement stage, that might warrant changing or extending the bid date.

A. Location: Proposals are received and opened at DGS offices in Harrisburg, Kutztown or Pittsburgh, generally dependent on the Project site locale. The Professional is welcome, but not required to attend the Bid Opening.

1101.5 QUALITY ASSURANCE AND HAZMAT MONITORING PROPOSALS. When Quality Assurance and Hazmat Monitoring are required, the Request for Proposals shall be issued during the bidding period. See Chapter 13 for further directions.

SECTION 1102 - DOCUMENTS

1102.1 REPRODUCTION AND DELIVERY. The Department will reimburse the Professional for reproduction of complete sets of Bidding Documents (Drawings, Project Manuals, etc.), distributed to prospective Bidders or Proposers, Bidder's Services, and the Department. The Professional shall submit invoices, showing actual direct costs, based on the Department-established maximum reproduction rates. The Department will also reimburse the Professional for the actual cost of delivery of Bidding Documents to bidder's services and the Department, with no markup or other administrative cost. The prospective Bidder or Proposer must pay for the cost of delivery of its own Bidding Documents. The Department will reimburse the Professional for cost of printing and delivery of all Bulletins.

1102.2 ASSEMBLY. All the drawings are to be bound into one (1) set or more under a Cover Sheet indexing them by Prime Contract (See Chapter 8). The specifications of all contracts are to be bound into a Project Manual, as described in Chapter 9.

1102.3 PROPOSAL FORMS. BPSAS prepares the Proposal Forms. The forms include liquidated damage stipulations, construction period and any particular Contractor stipulations and questionnaires. Any special information in this regard must be given to the Coordinator so that it may be considered by E/A prior to Proposal Form preparation. Base Bid scopes of work are not included in the Proposal Form; reference is given in the Proposal Form to the appropriate General Requirements paragraph of the Project Manual where the scope of work of each Base Bid is described. Proposal Forms to be filled in by the bidders are not bound into the Manual.

1102.4 NOTICE TO BIDDERS. BPSAS prepares the Notice to Bidders and furnishes an original to the Professional for reproduction and binding into the Project Manual.

1102.5 PREVAILING MINIMUM WAGE PREDETERMINATION. BPSAS obtains the wage rates from the Department of Labor & Industry or appropriate agency and furnishes an original to the Professional for reproduction and binding into the Project Manual.

SECTION 1103 - DISTRIBUTION

1103.1 REFUNDABLE DEPOSIT. A refundable deposit for bid documents is charged to prospective Bidders by the Professional. With the approval of BPSAS, the Professional must set a refundable deposit amount, based on the reproduction rates in the Professional Agreement. Mailing cost or cost of delivery is charged separately to the Bidders by the Professional. BPSAS will publish the deposit amount in the Notice To Bidders.

1103.2 PROPOSAL FORMS. Loose Proposal Forms, with envelopes, of the requested prime contract(s) must be included with each set of bid documents provided to potential bidders (Proposal Forms are not given to Bidders' Services). Bidders may have Proposal Forms for one or more prime contracts, without additional charge, at the time of, or after, the initial deposit for a set of bid documents so that they may bid more than one contract from a single set of bid documents.

1103.3 BID BOND AND FINANCIAL QUESTIONNAIRE. These documents to be filled in by bidders and furnished by DGS are included along with Proposal Forms. The Bid Bond must be inserted at the end of the Project Manual, but not bound in with the Project Manual.

1103.4 TO BIDDERS. The Professional must provide bid sets to prospective bidders within 24 hours of receipt of refundable deposit. Sets are to be distributed by overnight mail or other expeditious method. Each Bid Set shall include one (1) complete set of Drawings, one (1) complete set of Project Manuals, two (2) copies of the Bid Proposal form for each contract requested, and one (1) bid envelope for each contract requested. The Professional must maintain and furnish to BPSAS a list of those to whom documents are issued. In this regard:

A. Do not provide documents to prospective bidders after the date of the Pre-Bid Conference without first advising the bidder that a Pre-Bid Conference has been held.

B. Partial sets of bid documents are not sold or distributed to bidders, prospective Subcontractors or suppliers prior to Bid Opening. Sale of partial sets after Bid Opening is to be at a reasonable price.

C. When Plan holders for any contract are less than four (4) in number, the Professional shall attempt to interest other Contractors by direct solicitation.

1103.5 TO BIDDERS' SERVICES. Send, at no cost, complete sets of bidding documents to Bidders' Services as specifically designated by BPSAS.

1103.6 TO DGS. Prior to bidding, BPSAS will provide to the Professional a set of "Instructions For Processing Plans and Specifications During the Bidding Stage of the Project". As a Basic Service the Professional is to send copies of Bidding Documents to DGS, as follows. BPSAS may designate additional numbers, if needed. Bid Sets must be delivered to DGS on or before the Date of Release, indicated in the Notice To Bidders.

A. Send one (1) copy of the Project Manuals only (no Drawings) to DGS, Bureau of Minority and Women Business Opportunities (BMWBO), Room 611 North Office Building, Harrisburg, Pennsylvania 17125.

B. Send to Room G-5, 18th & Herr Streets, Harrisburg, PA 17125:

1. Sets of reproducible originals, and copies of Bid Documents (Drawings and Project Manuals), as requested by DGS Bureau of Professional Selections and Administrative Services (BPSAS).

C. Send four (4) complete sets of Bid Documents (Drawings and Project Manuals) to the DGS Eastern, Central, or Western Regional Construction Office, for the region in which the Project is located.

1103.7 TO CONTRACTORS. After execution of the construction contracts, the Professional is to furnish to each Contractor one (1) complete reproducible set of Drawings and Project Manuals designated in the General Conditions of the Construction Contract. The reproduction cost of these sets is included in the Professional's Basic Services. If requested by the Contractor or the Department, the Professional will supply one (1) restricted use set of CAD electronic non-editable files of all contract documents, in lieu of reproducible Drawings and Project Manuals.

SECTION 1104 - PRE-BID CONFERENCE

1104.1 PURPOSE. Pre-Bid Conferences are scheduled for critical or complicated projects, or as determined by the Department. 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.

1104.2 WHEN. The BPSAS will schedule a Pre-Bid Conference when required, as determined by the Project Coordinator. The Coordinator makes the determination after consultation with the Professional and Using Agency. Pre-Bid Conferences should occur no less than two (2) weeks prior to the Bid Opening Date.

1104.3 WHERE. Pre-Bid Conferences are held at the Project site, or closest available facility. The BPSAS makes arrangements for a meeting place with the Using Agency.

1104.4 THE PROFESSIONAL. The Professional must attend and chair the Pre-Bid Conference. Consultants' attendance is at the Professional's discretion. The Bureau of Construction and E/A representatives may attend, but normally will not. The BMWBO, if represented, will explain the DGS

minority participation policy and procedures. 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 are not to be issued in a Bulletin. Only written questions received resulting from the Pre-Bid Conference shall be addressed by a Bulletin.

1104.5 RESPONSE. Oral clarifications or explanations to prospective bidders during the Conference are informal and non-binding. Bulletins formally clarifying or amending the Contract Documents must be issued as soon as possible following the Pre-Bid Conference, and are to include formal answers to Pre-Bid Conference written questions.

SECTION 1105 - MODIFICATIONS

1105.1 BULLETINS. All Bulletins must be sent to BPSAS for approval before issue. The BPSAS initiates all Bulletins dealing with Administrative issues, such as Bid Opening and Proposals. The Professional initiates all Bulletins dealing with Technical issues. The Department will reimburse the Professional for cost of printing and delivery. All Bulletins are distributed by the Professional, with the following guidelines:

A. Distribute Bulletins at least nine (9) days prior to Bid Opening Date.

B. Distribute Bulletins to all Bid Document recipients.

C. Send all Bulletins by certified mail or acknowledged FAX.

D. Distribute only after BPSAS authorization and E/A signature.

E. See Chapter 13 for the distribution to DGS.

F. See Chapter 15 for examples of Administrative and Technical Bulletins.

1105.2 "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.

1105.3 CONRACTOR QUALIFICATION. Contractors and/or subcontractors are not pre-qualified, or approved prior to receipt of bids. For certain types of projects, contractor qualification standards are set in the specifications, and forms are submitted with the bid documents. The evaluation process takes place after bid opening and prior to Award.

SECTION 1106 - BID OPENING/AWARD

1106.1 ATTENDANCE. Bids are opened and read publicly by the Department. The Professional and bidders are welcome at the bid opening, but are not required to attend.

1106.2 EVALUATION. The DGS Legal, BMWBO, BPSAS, E/A and the Bureau of Construction evaluate the Bid Proposals. The acceptance of proposals and award of contracts is the sole decision of the Secretary of General Services or the Deputy Secretary for Public Works. The Department also sends a tabulation of the Bids to the Professional. Within three (3) calendar days the Professional must return a confidential report, including:

A. An evaluation of the reasonableness of the Bids and unit prices, when applicable.

B. Bidders' compliance with requirements.

C. Qualification and experience of the bidders.

1106.3 TIME. Proposals are good for sixty (60) days. Any extension of time will be requested by the DGS Legal unit.

1106.4 QUALITY ASSURANCE WORK. The Professional shall not award quality assurance work or other construction-related contracts before construction contracts are awarded and approval is given by the E/A. See Chapter 13, for more information.

SECTION 1107 - REBIDDING

1107.1 CAUSES. Projects may be rebid when bids received exceed the Base Construction amount, proposals are not responsive or responsible, or other reasons at the Department's discretion. Instructions for rebidding will be issued by the Department.

1107.2 DOCUMENTS. The Department will advise the Professional if any design or document modifications are required for a rebid. Incorporate all Bulletins 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", followed by the new issue date.

1107.3 ADMINISTRATION. Rebid, advertising, distribution and all other administration follows the same procedures prescribed for the initial Construction Procurement stage. DGS will reimburse rebidding costs when the rebid was not caused by Professional error, which error may include the low bids exceeding the Base Construction.

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 Bureau of Construction's Administrative Procedures, and the Construction Contract General Conditions.

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. After the Project is completed and formally accepted by DGS, the Professional shall execute a Certificate of Completion and revise the original Contract Documents, reflecting all changes recorded during the course of construction. Polyester originals shall be delivered to DGS and be identified as "As-Built Record Drawings". 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 Bureau of Construction Administrative Procedures.

1200.3 ADMINISTRATION. The Bureau of Construction is the lead DGS project administrator during the Construction Stage. The Bureau of Construction administers projects from three (3) Regional Offices, which are supervised by Construction Regional Director for each District. The Construction Inspector Manager from the Regional Office is the prime contact for the Professional and the Contractors. The Department may, at its discretion, appoint a full-time Construction Manager to oversee the Construction Administration.

1200.4 ROLE OF THE BUREAU OF ENGINEERING AND ARCHITECTURE. The E/A Project Coordinator serves as a Consultant to the Bureau of Construction during construction. E/A should be copied on all design-related correspondence, except shop drawings and product/material submittals.

1200.5 JOB CONFERENCES. DGS Regional Office representative 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 two (2) weeks of the execution date of the construction contracts. On-site work begins within ten (10) days following the Initial Job Conference.

B. A Pre-Construction Conference 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 Administrative Procedures detail the timing and process of administrative tasks and the distribution of documents and correspondence.

SECTION 1201 - PROJECT REPRESENTATION

1201.1 BASIC SERVICES. The Professional shall visit the project site at least bi-weekly during periods of construction. In addition to bi-weekly visits to project sites, the Professional is required to attend, at the request of DGS, 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.

1201.2 CONSULTANTS. It shall be the duty of the Professional to have his Consultants visit the project site periodically during their respective disciplines' period of active construction, at least bi-weekly, or at such intervals as required by DGS to insure 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 Department within seven (7) calendar days after each visit by Professional or his 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 Construction 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. DGS 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 following is an outline of the tasks that the Full Time On-Site Representative is to perform in addition to combination with, the Professional's Basic Services. The Professional will only be entitled to additional compensation for tasks over and above those already included in the Professional's Basic Services.

A. Assist DGS with inspection of the quality and progress of the work. Immediately inform the Professional and DGS of work not in compliance with the plans and specifications.

B. Review documents with Contractors and DGS Field Personnel. Obtain Professional's interpretations when the Site Representative cannot make an independent interpretation.

C. Represent the Professional at the bi-weekly Job Conference, with the approval of the Department.

D. Report to the Professional and DGS conditions which may cause, or are causing delays. Evaluate and propose solutions to situations that are or may cause delays.

E. Consult with the Contractors in the preparation of the Progress Schedule and attend scheduled meetings to review revisions to the schedule.

F. Review the installation of all equipment and materials for compliance with the approved shop drawings. The review and approval of shop drawings is a Basic Service of the Professional and is not a duty which can be assigned to the Full Time On-Site Representative without prior authorization of DGS.

G. Assist the Professional in the review of Change Order requests and Change Orders. Although Change Orders are to be prepared as a part of Basic Services, consultation and review by the representative is encouraged to expedite the process.

H. Maintain on-site records in an orderly manner. Records should include correspondence, contract documents, Change Orders, field orders, reports of site conferences, shop drawings, product data, supplementary drawings and specifications, requests for payments, etc.

I. With approval of the Professional, prepare and submit to DGS Field Personnel, supplemental drawings as required to clarify the work.

J. Observe, record and report to the Professional and DGS Field Personnel special test procedures, observations and where applicable, the results.

K. Review, approve or disapprove and process the Contractor's application for payment within seven (7) calendar days from the date of receipt.

L. Review the Contractor's forms related to the Steel Products Procurement Act, especially the ST-4 Forms; and to conclusively verify if a specified item is, or is not, produced domestically.

M. Assist the Professional with the Final Inspections and Closeout Inspections. Receive from the Contractors and transmit to the Professional all manuals and specific instructions, guarantees and warranties.

N. Keep a log of activities related to the Project, including weather conditions, nature and location of work being performed, verbal instructions and interpretations given to the Contractor, and specific observations. Record any occurrence that might result in a claim for change in Contract Sum or Contract Time.

O. Other tasks as directed by DGS, or as described in Additional Services.

1201.6 OVERRUN PERIOD. The Professional is required to continue Construction Administration Services to the Closeout 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 of the Agreement.

1201.7 CONTRACTORS' EXTENSIONS OF TIME. The Construction Contract Completion Date is the date of the Closeout 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 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 of the Contract and Administrative Procedures, must forward the Extension of Time request to the Professional

with substantiating data. The substantiating data shall 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, date and sign the Extension of Time (EOT) Form. Should the Professional not agree to the number of days requested, the Professional must state its reason for disagreement in the transmittal to the Regional Construction Inspector 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 Professional in writing of its request for termination of the EOT request. The Professional is required to submit its letter of recommendation within five (5) days of receiving the Contractor's letter of termination to the Director, Bureau of Construction. 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 included in the transmittal to the Director, Bureau of Construction.

SECTION 1202 - DOCUMENTS

1202.1 CONSTRUCTION SETS. Immediately after the execution of the construction contracts, the Professional must furnish to each Contractor one (1) complete reproducible set of Drawings and Project Manuals, as designated in the General Conditions of the Construction Contract. The reproduction cost of these sets is included in the Professional's Basic Services. If requested by the Contractor or the Department, the Professional will supply one (1) restricted use set of CAD electronic non-editable files of all contract documents, in lieu of reproducible Drawings and Project Manuals.

1202.2 SUBMITTALS. The Professional must promptly review and accept/reject shop drawings, samples and other submissions of the Contractors. The Professional must maintain a shop drawing log, and 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 Construction Contract General Conditions.

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 E/A. See Professional Agreement General Conditions and Construction 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 Contract Drawings and Project Manuals must be reviewed and approved by DGS prior to being issued to the Contractors. Drawings issued to clarify the work must be marked as "SUPPLEMENTAL", followed by the date of issue. Copies

are to be sent to all Contractors, the DGS Field Office, the District Office and to the Director of the Bureau of Construction. When Supplemental Drawings become too extensive, DGS may require the Professional to issue updated Construction Documents.

1202.4 "AS-BUILT" RECORD DRAWINGS. The Professional must check the Contractors' field documents at each site visit to see that as-built conditions are being recorded as the work progresses. See Section 1206, Close Out, for more information.

SECTION 1203 - QUALITY CONTROL AND QUALITY ASSURANCE

1203.1 GENERAL. The Professional must appraise and direct all specified tests and inspections of materials and equipment that DGS requires, 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 Director of the Bureau of Construction to stop the work and conduct re-testing or remediation in accordance with the General Conditions of 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 Sections 01400 and 01401, and the RFP for Quality Assurance Services, compile all lists of 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. The Professional is to review the qualifications of the Contractors' proposed testing agents, and then review and approve test reports.

B. QUALITY ASSURANCE TESTING AND INSPECTIONS BY PROFESSIONAL: Follow directions in Chapters 13 for contract administration of testing services contracted as Work Orders to the Professional Agreement. Earthwork monitoring is a separate Work Order to the Geotechnical Engineer who, in effect, is acting as the Quality Assurance Agent for earthwork.

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 Bureau of Construction Administrative Procedures (AP) for testing procedures. Similar procedures must be used for all tests. Refer to Construction Contract General Conditions, for additional requirements and procedures.

1203.5 PAYMENT. The Professional must follow Administrative Procedures for payments for testing agents under contract to the Professional. Payments for testing agents subcontracted to the Contractor(s) are addressed as all other regular payments for work completed.

SECTION 1204 - CHANGE ORDERS

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

1204.2 PROCESS. The Change Order sequence must be followed in detail as provided by the Bureau of Construction. The sequence is tied to the tracking system used by DGS Fiscal to assure funding availability for approved Change Orders. The Professional must check the Bureau of Construction Administrative Procedures for guidelines in issuing all Change Orders.

A. DGS may stop a Change Order at anytime in the process. See Construction Contract General Conditions (Changes in the Work) and Administrative Procedures for additional direction.

1204.3 EVALUATION. The Professional must evaluate all Change Orders at two (2) steps in the sequence. First, the initial request must be evaluated to determine that it is a valid change and is not work already in the Contract. Second, 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 Construction Regional Director with explanation of disagreement. The Bureau of Construction 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 should invoice DGS for fees on approved Change Orders on Change Order Fee Payment Invoice. Change Order fees are at the Basic Services fee percentage set for the Project, or as negotiated as an additional service in accordance with the Agreement.

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 Project Coordinator. The Professional should not proceed without a determination except in emergency situations.

1204.6 ERROR/OMISSION. No fee is paid to the Professional, and damages may be assessed, for Change Orders determined to result from Professional error or omission. DGS's preliminary determination is marked on the approved Change Order form. 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. The assessment method is explained in the Agreement, Errors and Omissions. Bureau of E/A will contact the Professional to gain its opinion as to errors or omissions. The Public Works E/O Committee will then make a determination, considering the Professional's opinion, and notify the Professional. The Professional may contest the Committee's assessment informally and if not satisfied, may pursue the formal dispute process.

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 DGS Field Representative. The Construction Inspector Manager will issue a written Field Order when all agree. See Construction Contract General Conditions, (Minor Change in the Work).

SECTION 1205 - CONTRACTOR DISPUTE PROCESS

1205.1 GENERAL. Contractors' disputes with DGS are addressed through a progression of increasingly more formal proceedings. The progression is described in the Construction Contract General Conditions, Dispute. 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 PRE-CLAIM HEARING. This is the first step in the formal dispute process. An effort will be made to resolve all disputes before this step is reached. The Conference is chaired by the BPSAS Arbitration Division. The Professional, E/A, Construction District Office, Inspectors, BPSAS Arbitration Division, and Office of Chief Counsel attend to consider the Contractor's grievance. The Arbitration Committee makes a recommendation for settlement or denial to the Deputy Secretary. The Office of Chief Counsel then notifies the Contractor of the decision.

1205.3 BOARD OF CLAIMS. Disputes not resolved in the Pre-Claim Hearing may be appealed to the Board of Claims by the Contractor. 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 Professional Agreement determine when additional compensation will be paid for these services.

SECTION 1206 - PROJECT CLOSE-OUT

1206.1 DEPARTMENT OF LABOR AND INDUSTRY 'AS-BUILT' RECORD DRAWINGS. The Professional is responsible for submitting to the Department of Labor and Industry a revised set of Construction Documents for approval for changes made during construction that are not in accordance with the approve Construction Documents. This revised set of Construction Documents shall be referred to as 'L&I' As-Built Record Drawings and shall be submitted in accordance with L&I UCC requirements.

1206.2 DGS 'AS-BUILT' RECORD DRAWINGS. Within ninety (90) days from the 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 Drawing 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 field office and from Change Orders. The As-Built Record Drawings shall be on archival polyester reproducible media and three identical copies of electronic formatted documents suitable to DGS shall be identified as "Record Drawings", shall be delivered to, and shall become the sole property of, the Department.

1206.3 OPERATION/MAINTENANCE MANUAL. After Final Inspection the following should 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 Professional must review the Operation/ Maintenance Manual for completeness and accuracy. If unacceptable, it is to be returned to the Contractor with specific criticisms. If accepted, forward to DGS four (4) copies. See the Construction Contract General Conditions, and the Professional Agreement General Conditions.

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 of the Professional Agreement.

1206.5 FOLLOW UP INSPECTION. After Closeout Inspection, the Professional is to perform follow up inspections, if required by the Department. The Professional will attend the inspections and/or meetings, with Consultants as needed. The Director of Construction gives notice of the Inspection to 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 in Chapter 17 of the IBC.

A. The Department requires that Professionals follow our strict guidelines regarding testing and inspection in the interest of uniformity of administration by our Construction Division. The Professional is to include our Sections 01400 - Quality Control Testing Services, and 01401- Quality Assurance Testing and Inspection Services for structural-related testing and inspections, adopt the Department's program and Project Manual format and terminology, and assign testing and inspection responsibilities to the recommended parties. Although structural testing and inspection is to follow strict DGS guidelines through the RFP process for Quality Assurance Services, QC and QA is not restricted to structural materials. Non-structural materials and systems which are to be independently tested or inspected are to have the testing specified within the appropriate technical specifications. 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. All testing is to be Quality Control Testing (by the Contractor's QC Agent) with random check testing under Quality Assurance (by Professional's QA Agent). Quality Control tests shall be required by specific type and frequency or quantity of tests. The exception to this is soils testing. Soils testing is to be Quality Control with no specified quantities. The Contractor is to do whatever testing is required, without limitation, to comply with specification standards. Construction monitoring of earthwork and soils testing is by the Professional's Geotechnical Engineer, who is acting as the QA Agent for soils work. Refer to Chapter 14 for specification requirements, and to Chapter 15 for instructions and sample RFP for Geotechnical Services.

A. All Special Inspections required by IBC Chapter 17 are to be Quality Assurance (by Professional's QA Agent).

B. When structural Quality Control Testing is required, the technical specification shall refer to Section 01400 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 Inspection is required the technical specification shall refer to Section 01401 for all testing and inspection requirements, where types of tests and inspections only shall be listed. Testing and inspection requirements shall not be stated in the technical specification sections.

1301.3 WORK ORDER FOR QUALITY ASSURANCE TESTING AND INSPECTION SERVICES

A. If Quality Assurance Testing or Inspection is required, the Professional is responsible, under a Work Order, to provide this additional service. The Construction Documents Submission shall include the RFP for Structural-Related Quality Assurance Services and the RFP specifics shall be coordinated with requirements for testing and inspections in the Project Manual. The RFP shall contain specific quantities of each test or inspection hours in order to establish a low bidder for the QA Services. Refer to Instructions for Quality Assurance Testing and Inspections Services and Sample RFP in Chapter 15 for details of the process and suggestions on selecting tests and inspections. Based upon Project conditions and Contractor performance, the Professional is to authorize check 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 IBC, including Chapter 17 of the IBC. Tests shall be standard tests that are identified by ASTM or other designation. Include any tests that might be taken in order to establish unit prices. The budget as well as the low bidder for the Quality Assurance Services for the Project will be established by the total of the extended test/inspection items.

B. The Construction Documents Submission shall include the RFP documents for Quality Assurance Testing and Inspection Services. One (1) copy will be returned to the Professional indicating our approval or disapproval.

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 E/A with a cover letter indicating recommendations.

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 his Consultants as it deems appropriate. It should direct the testing and inspection in accordance with need, based upon minimum documentation, Contractor performance, Quality Control Agent reports, quality of materials furnished, Project conditions and UCC requirements.

F. The DGS inspection staff 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 inspection 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 inspection staff.

G. The Department Inspector(s) are to coordinate the performing of tests and inspections, and ensure that they are authorized by the Professional are completed as specified and test

data/results are submitted to the Department and Professional for review and approval/disapproval as well as to the Contractor. When unsatisfactory test results occur, the Department Inspector(s) are to confer with the Professional and ensure that appropriate action is initiated.

SECTION 1302 - UTILITY REQUIREMENTS

1302.1 PURPOSE. The purpose is too outline the procedure for providing utilities on DGS projects.

1302.2 ORIENTATION. At the Orientation Conference, professionals are advised of their responsibility to arrange the installation of all required utilities for the Project. The Department provides a procedure checklist for the professional to follow.

1302.3 SCHEMATIC DESIGN. During Schematic design, 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) confirmed with a letter. Professional should advise utilities to respond in writing within 3-4 weeks with proposed service information. Where the utility service is from a campus system, the Using 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.

1302.4 SCHEMATIC SUBMISSION. The Schematic 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.

1302.5 DESIGN DEVELOPMENT. Building design will continue based on the Schematic approval. As part of Schematic approval, the building should be located 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 system owned by the Using Agency, the Using Agency will determine adequacy and point of connection. 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 initial contact with the utility company for construction of the off-site work under a separate Phase. Where the utility company's fee and schedule places a large burden on the Contractor and the project construction schedule, doing the work directly with the utility company under a separate phase should also be considered.

1302.6 DESIGN DEVELOPMENT SUBMISSION. 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 preliminary site development plans, assigning utilities to the Prime Contracts in accordance with the Division of Work outlined in Chapter 2.

1302.7 CONSTRUCTION DOCUMENTS. During Construction Documents, 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 DGS Project Coordinator for initiation of a utility agreement(s). The necessary drawings for DGS Legal to prepare easement documents shall be included.

A. 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 shall be adjusted by Change Order in accordance with the General Conditions.

1302.8 UTILITY EASEMENTS/AGREEMENTS. All information must go through the Project Coordinator for tracking purposes. The Professional shall provide to the DGS Project Coordinator, the final utility company information, including a written legal description of each proposed easements, along with a drawing showing the location of each easement, with the metes and bounds; as well as any other information required by DGS Legal Unit. The Project Coordinator informs the DGS Legal Unit that a utility easement/agreement(s) must be developed, and discusses details and the project schedule, and transmits to Legal the utility company scope of work, the service routing plan (with right-of-way), utility company cost proposal and utility company point of contact. Using this information, Legal develops a utility easement/agreement.

1302.9 CONSTRUCTION DOCUMENTS SUBMISSION. The Professional must follow the service requirements of each utility company described in its scope of work. The Professional should show all service work required by DGS contractors on the contract documents, as well as work provided by the utility company.

1302.10 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 Design 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 Professional shall provide the Construction Manager with drawings, specifications and other information pertinent to the selected Construction Management services. Professional shall provide one (1) complete set of submission documents at each Design Stage to the CM, as part of its Basic Service.

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 Professional shall provide the Construction Manager with drawings, specifications and other information pertinent to the full-time Construction Management services. The Professional fee negotiated before commencement of the Project will include all costs for providing the necessary documents and information to the Construction Manager.

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 insure 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 GEOTECHNICAL REPORT

1305.1 SCOPE. The Professional shall obtain assistance from its Civil/Structural Engineer as set forth in these instructions and in Chapter 15, 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. Cost analysis and estimating of 'Unclassified' excavation by Professional and Contractor/ Bidders.

E. Analysis of excavation and fill conditions.

1305.2 INITIAL SUBSURFACE AND RELATED SITE INVESTIGATION REPORT.

A. Prior to Schematic Submission the Professional's Civil/Structural Consultant shall, with the Professional's help, contact the E/A's Soils Engineering Section 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 Schematic 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. Three (3) copies of the RFP documents shall be included in the Schematic Submission for review and approval.

1305.3 CONTRACTING FOR GEOTECHNICAL SERVICES. Geotechnical Services shall include test borings and other subsurface investigation, the Geotechnical Report and Construction Monitoring, all to be quoted at one time 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 Final submission a sealed statement to the effect that the design drawings and specifications are in accordance with his recommendations. See Chapter 15 for the detailed Instructions for 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 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. The proposals shall be submitted to the Project Coordinator for written approval to award the Work Order.

F. The Geotechnical Report shall not contain a broad disclaimer that excuses the consultant of responsibility.

1305.4 TIME OF COMPLETION OF INVESTIGATION. The subsurface investigation and Geotechnical Report must be completed prior to, and the results shall be part of, the Design Development Submission. The Department may grant an extension of time for this requirement, if necessary.

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

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

B. Upon completion of the boring contract, the Geotechnical Consultant shall submit to the Professional six (6) copies of a complete report, covering the field work and laboratory testing, with complete analysis of each boring and with recommendations for soil and rock bearing capacities. The Professional shall retain one (1) copy, submit one (1) copy to its Civil/ Structural Consultant, and submit the remaining four (4) copies to E/A. If the report is not ready at the Design Development submission, one (1) copy of the draft shall be submitted.

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 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, 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. Contractors are permitted to obtain copies of the complete Geotechnical Report, providing they sign the Department's Receipt for Geotechnical Report form containing disclaimers. This form is furnished as an exhibit in Chapter 15. The Professional is to keep these receipts for the record and may charge bidders for the cost of reproduction.

1305.8 CONSTRUCTION SUPERVISION. In order to assess the Contractor's Quality Control Testing program, earthwork monitoring during construction shall be provided by the Geotechnical Consultant. On-site presence and laboratory tests during the construction period shall be provided at rates stated in its Proposal for Geotechnical Services, and in an additional Work Order awarded after the Project proceeds to construction

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 presence of wetlands by 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 the Professional shall prepare a program outline and submit it to E/A for approval. After approval, proposals shall be solicited t least three (3) suitable consultants. The proposals shall be submitted to the Project Coordinator for written approval, and to write the Work Order for the additional services. DGS 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 three (3) copies of the completed study to the Department.

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 Project Coordinator for written approval, and to write the Work Order for the additional services. See Section 1318 for more detailed requirements. The Professional shall submit three (3) copies of the completed study to the Department.

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 Index (PNDI) maintained by the Pennsylvania Natural Heritage Program in the Department of Conservation and Natural Resources. 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 E/A for approval. After approval, proposals shall be solicited. The proposals shall be submitted to the Project Coordinator for written approval, and to write the Work Order for the additional services. The Professional shall submit three (3) copies of the completed study to the Department.

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 Protection Act (NEPA) in the form required by the Federal Agency that is providing the 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 Project Coordinator for written approval, and to write the Work Order for the additional services. The Professional shall submit three (3) copies of the completed study to the Department.

SECTION 1307 - HAZARDOUS MATERIALS

1307.1 PROFESSIONAL'S RESPONSIBILITIES TO THE DEPARTMENT. Most major building renovations or additions will encounter some kind of hazardous material (Asbestos, Lead, PCB, Radon, 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 of the Project design, the Professional, through consultation with the Department and the Using Agency, determine whether hazardous materials are present on site, requiring a hazardous material study and evaluation. A hazardous material Study and Evaluation (Part One) and Quality Assurance Consultant services (Part Two) are considered Additional Services as described herein, and the Project Coordinator 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 as guidance in Chapter 15). The Professional must submit a draft of the RFP for Department approval. The Part One work is to be completed prior to the Schematic Design submission so 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. 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 not-to-exceed Work Order for either Part One or Part Two, 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 provided in Chapter 14 of this manual, which indicates 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.

1. Part One – Survey for Hazardous Materials shall include researching available survey reports, historical data and test data, survey the site, sample and test all suspect hazardous materials in or adjacent to the project areas. Existing asbestos survey reports for State owned buildings should be obtained from the Using Agency. If not available from the Using Agency, contact Project Coordinator. Provide a complete survey report, with location drawings and tabulated sample results. Include strict Chain-of-Custody procedures, including use of Chain-of-Custody forms. 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 Study and Evaluation Report services. Note: the identification of hazardous materials shall be limited to the specific project areas and adjacent areas, as applicable, 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. A cost Estimate for recommended abatement for all hazardous materials must be included in the Executive Summary. For lead based paint surveys, consultant shall report levels of lead per OSHA thresholds, not just levels per HUD/EPA protocol. A sample of request for proposal (RFP) is provided in Chapter 15.

2. Part Two – Quality Assurance Consultant Monitoring Services shall include on-site daily inspections during abatement activities, monitoring regulation compliance, requirements of the specification, and collection of appropriate samples during the abatement work, project documentation and final clearance testing and reporting. This additional service work shall be in accordance with the Protocol Regarding Asbestos, Lead, PCB's/Mercury, Radon and Other Hazardous Materials (Chapter 14), as a guide in developing the proposal. Part Two services shall be solicited using the same process as Part One services. The proposal solicited shall include a daily rate for the above Quality Assurance Consultant responsibilities which is inclusive of 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. The number of days expected for QA monitoring must be provided in proposal letter so consultants all provide quotes for the same duration and scope of work. Proposal quotations shall be not-to-exceed amounts. A sample of request for proposal (RFP) is provided in Chapter 15.

1307.2 EXAMPLES OF HAZARDOUS MATERIALS PROPOSAL LETTERS. See Chapter 15 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 DGS Survey Section, Using Agency and the Institution. After collection and evaluation of initial data the Professional and his Consultants must inspect the site, including roads, storm drainage system, sewage treatment and disposal, water supply, primary and secondary structures, parking lots, walkways and lawns, grades, drainage, utilities, existing structures, physical features and other significant items.

1308.2 REQUEST FOR PROPERTY/TOPOGRAPHIC SURVEY. After analyzing the data and the Project requirements the Professional shall promptly submit to Project Coordinator, a report bearing the title, 'REQUEST FOR PROPERTY/TOPOGRAPHIC SURVEY' and containing the following particulars:

A. Location of site (small scale map).

B. Description of site and plan, including limits of required survey.

C. Approximate area of site.

D. Available survey, bench marks and reference points.

E. Description of required survey, including scale, contour intervals, etc. Proposed survey must be consistent with proposed Project Design and nature of Contract Documents.

F. Phasing of survey work (if applicable), and schedule to be coordinated with various Stages of design.

G. Please note that the required topographic information shall include, but is not limited to spot (field) elevations, first floor elevations and description of all buildings, top and bottom of retaining walls and structures, curbs, steps and similar structures. Tops and inverts of manholes, inlets and outflows of storm and sanitary sewers, type, size, elevation and sketches of structures as needed, all visible utilities, paved areas and description, 6" and larger trees and/or wooded areas, 2' contour lines horizontal control (traverse lines, control points) lines with description (coordinate N&E, nail, hub, rail road spike, elevation), establishment of permanent references (minimum 3 references to control point and reference drawing on plan), and permanent bench marks tying to U.S.G.S. or U.S.C., and G.S. control. GPS work will require an OPUS Report.

H. All right-of-way and easement information.

1308.3 AUTHORIZATION OF SURVEY WORK. E/A will review the Request for Property/ Topographic Survey and inform the Professional whether the proposed survey will be performed by the E/A Survey Section, or by an outside Professional Land Surveyor to be retained by the Professional or the Department.

A. If the Professional is directed to retain an outside surveyor, he should obtain proposals for performing the required survey work from a minimum of three (3) Professional Land Surveyors located in the Project vicinity. Proposals shall be submitted on the Department Proposal Form to E/A, Attention Supervisor, Survey Section, 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 E/A 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 2, Publication 122M, latest version.

1308.5 ACT 287, UTILITIES. The Professional shall comply with the current Act 287 (amended by Act 187 of 1996), 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. Surveyor shall identify and record PA One-Call paint marks on the survey.

1308.6 SURVEY DOCUMENTS. Reproducible mylars (signed, sealed and dated) and electronic files covering all survey work performed, shall be submitted to E/A, before the submission of an invoice for the last 10% these additional services by the Professional.

1308.7 PROPOSAL FORM. The sample Proposal Form for Land/Property/Topographic Surveys and Cost Estimate are provided in Chapter 15.

SECTION 1309 - SUBSURFACE UTILITY ENGINEERING

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 Engineering will be considered.

1309.2 SCOPE. 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 E/A 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.

1309.3 PROCEDURE. After approval of the Schematic 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 E/A for Subsurface Utility Engineering shall be in writing and must include a detailed plan of the area to be investigated. The E/A 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 his work.

C. The Professional shall review the proposals and submit them to E/A with recommendations for contract award. E/A 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.

1310.2 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 E/A 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.

1310.3 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.

1310.4 COAL FUEL NON-USE JUSTIFICATION. State Act 1990-28 requires that any heating system or heating unit installed in a Commonwealth-owned facility use Pennsylvania coal as a source of fuel. In addition to the considerations listed in Chapter 4, the following should also be addressed and expanded when a fuel other than coal is proposed:

A. Using coal as the fuel for the heating system or heating unit would violate existing or reasonably anticipated environmental laws or regulations.

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.

C. Using electricity generated primarily from the combustion of coal would be more cost effective when compared to using coal as the fuel for the heating system or heating unit.

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.

1310.5 PROCEDURE. After review of the Schematic Submission E/A will determine if a Fuel Feasibility Study is required for further development of the project. E/A will notify the Professional in writing and request a cost proposal to provide the study. Once 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 as a Basic Service as described in Chapter 4, as part of the Schematic Submission.

SECTION 1311 - CONDUCTING AN INDOOR AIR QUALITY (IAQ) ASSESSMENT PROGRAM

1311.1 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 contaminates 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 Agency client in advance of the Substantial Completion Inspection.

1311.2 THE BASELINE ASSESSMENT. After Final Construction 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 contaminates 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.

1311.3 BUILDING AIROUT. This procedure shall be initiated, if required:

A. If the baseline assessment reveals air contaminates 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^{o}F to 80^{o}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.

1311.4 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 contaminates, 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 1311.2 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 1311.2 B (3) and 1311.2 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.

1311.5 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 CO_2 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 1311.2 B, plus testing for CO_2 and be included in a Final Building Indoor Air Quality Report.

1311.6 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 insure that the building systems are operated as directed, but within limitations to avoid non-compliance with all construction warranties.

SECTION 1312 - PREPARATION OF BIDDING DOCUMENTS

1312.1 PURPOSE. The purpose of these instructions is to provide the Professional with guidance in the updating, preparing and handling of Construction Contract Documents during the Construction Procurement Stage. Information contained in these instructions is consistent with and amplifies information contained in Chapter 11 of the E/A Project Procedure Manual.

1312.2 ITEMS TO BE CHECKED. Prior to collating and binding the Project Manual, when preparing bidding documents, the Professional must:

A. Be sure that all documents listed as “to be issued” in the Table Of Contents have been included in the package received from the DGS Bidding Unit.

B. Be sure that all requested corrections have been made to the specifications.

C. Be sure that the number of calendar days of temporary heat is inserted in the General Requirements.

D. Check the Proposal Form to be sure that the contract duration in calendar days is correct.

E. Check the Proposal Form to be sure that all Base Bids are properly established as reflected in the General Requirements.

F. Check the Notice to Bidders to be sure that the Professional’s name, address and telephone number are correct.

G. Be sure that the brief description on the Notice to Bidders is in accordance with the design.

1312.3 ORDER OF BINDING. Bind the Project Manual in accordance with the requirements in Chapter 11. Loose copies of Proposal Forms, Bid Bond Form, and Financial Questionnaires required to be filled out by the Contractor, will be provided loose to the Professional as required by the Project. Sample of these forms shall be bound in the Project Manual for information purposes only.

1312.4 BIDDING DOCUMENTS. All prospective prime contract bidders, upon request and presentation of their refundable deposit check, shall receive:

A. 1 – Complete set of Drawing prints

B. 1 – Complete Project Manual*

C. 2 – Loose copies of the Bid Proposal Form for contract(s) requested**

D. 1 – Loose Bid envelope for each contract requested

* The bid bond and financial questionnaire must be inserted loosely in the Project Manual, but not bound with the specifications, before distribution to bidders.

** Each bidder may receive Proposal Forms for as many separate prime contracts as it desires with the purchase of a single set of bid documents, without any additional charge.

1312.5 TIMING. As soon as the Project has been advertised by DGS, Drawings and Project Manuals must be ready for immediate distribution. The Department's copies of Drawings and Project Manuals should be delivered no later than one (1) week after the Bid Issue date. Refer to Chapter 11 for number of copies, and addresses for distribution.

1312.6 DOCUMENTS DELIVERED TO BIDDERS' SERVICES. As soon as the Project has been advertised, the Professional is to forward complete set of Drawings and Project Manuals to Bidders' Services as specified in Chapter 11.

1312.7 DISTRIBUTION OF BULLETINS. No Bulletin shall be distributed to any prospective bidder less than nine (9) days before the Bid Opening Date. Furthermore, no bulletin shall be issued unless it has been approved and signed by the Director of the Bureau of Engineering and Architecture, or the Director of the Bureau of Professional Selections and Administrative Services.

A. See Chapter 11 for more detailed requirements regarding bidding.

B. See Chapter 15 for examples of Technical and Administrative project Bulletins.

C. The Professional is to distribute the Bulletins to all prospective bidders and Bidders' Services on the date of issue.

D. The Professional shall send to the Department, within five (5) working days of issuance, copies of Bulletin in the same number as required for specifications in Chapter 11.

SECTION 1313 - PREPARATION OF STANDARD DRAWINGS AND PROJECT MANUALS

1313.1 DRAWING STANDARDS. Refer to examples in Chapter 15 for guidance on drawing standards. The standard drawing sheet dimension is shown in Chapter 8 and in Chapter 15. The Cover Sheet, Approval Blocks, Title Blocks and Standard Plaque must have the proper names of the approving authorities, the correct names of the Professional and Consultant and the correct Project Number and Title, etc., entered in the appropriate places. Identify on the Cover Sheet the responsibilities of the Consultants.

1313.2 PROJECT MANUAL STANDARDS. The Professional shall use DGS standards for Project Manual Cover Page, Table of Contents, List of Drawings, and Division 1 - General Requirements sections. See examples found in Chapter 15.

1313.3 TABLE OF CONTENTS. See Exhibit in Chapter 15, for the order in which the documents under Bidding and Contract Documents for all Contracts, and Sections under Division 1 – General

Requirements must appear for all DGS projects. Professional shall discuss with the Project Coordinator which documents are applicable.

A. Documents listed as 'To be issued' will be furnished to the Professional as a master for incorporating into the Project Manual prior to printing. The Professional must include the appropriate page numbering.

B. Table of Contents, List of Drawings, and all applicable Division 1 sections must be included in the Project Manual.

SECTION 1314 - SPACE STANDARDS FOR DGS PROJECTS

1314.1 PURPOSE. To promote a uniform and efficient use of office space throughout all state agencies, DGS has adopted standard allotments of space for various job descriptions and positions. The DGS space standards are based on the area required for each individual workstation or function. Deviations from the guidelines may be made to accommodate special needs and idiosyncrasies of specific projects, but only with E/A's approval.

1314.2 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	**DETERMINATE**	**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

1314.3 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 1315 - COMMISSIONING

1315.1 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 Prefunctional 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 1-1996. 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. Professional shall provide one (1) complete set of submission documents at each Design Stage to the CA, as part of its Basic Services. The Professional shall also attend commissioning meetings, review commissioning reports, and assist with Using Agency training. The CA will provide specification sections (for Divisions 1, 15A, 15B and 16) to the Professional, for inclusion into the Project Manual.

1315.2 PROFESSIONAL'S TASKS. Following are representative individual tasks that DGS expects the Design 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 Using 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 DGS Project Coordinator.

SECTION 1316 - SUSTAINABILITY GUIDELINES AND LEED PROJECTS

1316.1 PURPOSE. In order to provide the highest standards of energy efficiency, indoor air quality, and interior working environments in Commonwealth buildings, the Bureau of Engineering and Architecture recommends incorporation of the following sustainable materials, systems, and principles in DGS projects, when the Budget allows.

1316.2 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.

1316.3 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. Access floor systems (with air distribution); energy savings through lower delivered air temperatures, less fan energy, reduction in size of air handlers, and 'extended economizer range'.

H. Toilet/Shower stall partitions manufactured from recycled plastic or steel.

I. Recyclable carpet (and carpet with recycled backing material).

J. Use of tile made with recycled glass.

K. Use of products with low V.O.C. emissions.

L. Use of Certified Wood Products (a Pennsylvania renewable resource).

M. Use of natural energy and elements from the environment (solar, wind, and landscaping) to reduce energy consumption.

N. Use of recovered coal fly ash in concrete mixtures.

O. Use of thermal mass of building to reduce heat flow through the building envelope.

1316.4 HVAC PRINCIPLES.

A. HVAC equipment is specified to be in compliance with the latest ASHRAE standards for energy efficiency and environmental impact.

B. Automatic temperature control systems – reduce energy consumption.

C. Use of insulation on piping, ductwork, hot water heaters – reduces heat loss.

D. Economizer cycle for HVAC system – reduces energy consumption.

E. Natural gas for heating fuel (if applicable) – clean burning with low emissions.

F. Use of ozone friendly refrigerants.

G. Use of heat recovery systems.

1316.5 PLUMBING PRINCIPLES.

A. Use of low water consumption plumbing fixtures and automatic faucet controls; Reduces water usage and energy necessary to heat water.

B. Use of large hot water holding tanks; Reduces cost of energy to heat water by taking advantage of off-peak hours.

1316.6 ELECTRICAL/LIGHTING PRINCIPLES.

A. Energy saving electronic light fixture ballasts with T-8 fluorescent lamps; Reduces electricity required for lighting.

B. Use of time clocks to regulate electric lights; Reduces electricity used.

C. Use of indirect lighting; Reduces energy required due to lower lighting levels required.

1316.7 GENERAL. 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.

1316.8 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, he shall hire a specialty LEED consultant to guide his 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 his 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 necessarily include full service Building Commissioning. The Department will contract directly with the Commissioning Agent, as described in Section 1315, Commissioning.

SECTION 1317 - ELECTRICAL EQUIPMENT WIRING RESPONSIBILITIES

1317.1 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 sections of the contract, which is 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 this section of the contract. In addition, the Electrical Contractor shall furnish, install and connect all power wiring to all equipment, associated controls and appurtenances provided under other sections of this contract, 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 1318 - ARCHAEOLOGICAL AND HISTORICAL REQUIREMENTS

1318.1 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 Review, the Professional is requested to contact the PHMC for their review of the location and scope of the work.

A. Inquiries shall be directed to:

Bureau of Historic Preservation
Pennsylvania Historical & Museum Commission
400 North Street, Commonwealth Keystone Building, 2nd Floor
Harrisburg, Pennsylvania 17120-0093
Telephone: (717) 783-9926

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.

1318.2 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.

1318.3 HISTORICAL. After initial contact with the applicant, PHMC checks whether the building is on, or is eligible for, the National Register. A survey form is used to determine eligibility. The Professional shall complete the form to the best of his 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.

1318.4 PROJECTS FOR PHMC. On Projects for which the Pennsylvania Historical and Museum Commission is the Using Agency, the Professional shall include in the Division 1, General Requirements, Specification Section 01120 – Historical and Museum Commission Projects – Supplemental Provisions (available at the DGS Internet website).

A. The Professional shall consult with the DGS Project Coordinator to discuss the extent of editing Section 01120 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 1319 - FLOOD PROTECTION PROJECTS

1319.1 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 Using 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.

1319.2 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 Submission.

1319.3 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.

1319.4 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.

1319.5 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.

1319.6 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.

CHAPTER 14
DGS SPECIFICATIONS REQUIREMENTS

SECTION 1400 – INTRODUCTION

1400.1 PURPOSE. This Chapter contains technical guidelines and requirements documents for reference or use by the Professional. Follow the instructions preceding each document on the specific recommendations or requirements for use of that document.

1400.2 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 of same 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 2 and Division 3 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 16. Deviations from this instruction must be discussed with the Project Coordinator.

SECTION 1401 - DIVISION 1, GENERAL REQUIREMENTS

1401.1 INTRODUCTION. The General Requirement Sections are standard to all DGS projects and apply to all Prime Contracts, and should be edited as necessary. They are written to compliment the Construction Contract General Conditions and other standard DGS Contract Documents. The Sections are to be included in the order listed. Additional Sections may be inserted between standard Sections where appropriate.

A. All Division 1 – General Requirements Sections may be downloaded from the DGS Internet website at www.dgs.state.pa.us.

B. Editing Standard Sections: The Professional must edit the Sections to add, delete or modify provisions to suit the individual Project. Each Section, as presented here, includes notes to the specification writer. 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.

C. Adding/Deleting Sections: Delete Sections not applying to the individual Project. 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 1 sections of other published specifications, which may have conflicts with the DGS standard General Conditions of Contract, Division 1 – General Requirements, and Bureau of Construction Administrative Procedures.

D. Do not edit Sections to modify provisions of the General Conditions without specific authorization of DGS.

E. See sample of Table of Contents in Chapter 15 for sections listed under Division 1 – Special Requirements. Verify with Project Coordinator, which sections are applicable to the Project.

1401.2 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.

A. The Work of each Base Bid shall be adequately summarized in Section 01030 – Base Bid Descriptions, to establish the Scope of Work. The Drawings and Specification shall thoroughly describe and detail the changes required by each Base Bid, to the previous Base Bid.

B. The Professional shall submit a minimum of three (3) Add Base Bids, ascending in approximately equal value increments, each with its statement of probable construction cost. Base Bid No. 1 shall be 80-85% of the Base Construction amount. Each Base Bid adds work to the previous Base Bid. The highest Base Bid should be as close to the Base Construction amount as possible. All Add Base Bids shall be within the Base Construction amount. These Add Base Bids shall be acceptable to the Using Agency and approved by the Department.

Example:

- Base Bid No. 1 – Shall include all the work as shown on the Drawings and described in the Project Manual, as Base Bid No. 1.
- Base Bid No. 2 – Same as Base Bid No. 1, except add: _____.
- Base Bid No. 3 – Same as Base Bid No. 2, except add: _____.

C. The number of Base Bids is limited to four (4), unless approved by the Department.

D. 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 herein shall be the same as the previous Base Bid description.

E. 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 01030 - Base Bid Descriptions of the Division 1 - General Requirements.

SECTION 1402 - EARTHWORK SPECIFICATIONS

1402.1 DGS REQUIREMENTS. There is to be only one Earthwork specification in the Project Manual. Section 01040 - Coordination and Control should include a paragraph stating that each Prime Contractor is to include all earthwork and concrete work for its own work in accordance with applicable requirements of Division 2 and Division 3 sections. And where Sitework or other General Construction specifications require earthwork, it should be specified by requiring compliance to the main earthwork specification. If there are any special earthwork or concrete work requirements for Prime or specialty contractors not covered by the Earthwork specification, they should add these special requirements to their sections without nullifying the requirements of the Earthwork specification.

A. Include the following standard article defining "unclassified:"

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 of the Construction Contract.

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

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 logs 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 at the office of the Professional upon signature of a standard form of receipt, whereby the bidder acknowledges and understands that the information and recommendations in the Report is 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 shall therefore undertake to

perform their own investigation of existing subsurface conditions. The Department will not be responsible in any way for the consequences of the Contractor's failure to conduct such investigation. Excavation for the Project is "Unclassified", as fully described in the Earthwork Section.

C. Include the following standard article on approval of bearing:

APPROVAL OF BEARING STRATA

1. The Contractor shall furnish adequate advance notification to the Department and the Professional of times when footing excavations are to be completed, so that the bearing quality of bottoms may be inspected and/or tested and approved. Formwork and concreting shall follow only after this approval.
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 01400 and this section, to produce end results specified. The Contractor 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.
2. The Contractor shall submit its plan for Quality Control testing to the Professional and the Department for review and comments.
3. Quality Control tests shall include tests on fill material, optimum moisture content and maximum density and field density tests of fill layers. The Q.C. Testing agent shall comment on the suitability of all subgrades, and the subgrades shall be acceptable to the Q.A. Agency.
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 affect 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 Quality Assurance tests in accordance with Section 01401 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.

E. Compaction standards are to be based on Modified Proctor standards, as defined by ASTM D1557.

F. A complete earthwork specification is available upon request.

SECTION 1403 - CAST-IN-PLACE CONCRETE SPECIFICATIONS

1403.1 DGS REQUIREMENTS. The cast-in-place concrete specification 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. 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 01400. As with earthwork, there is to be only one Cast-In-Place Concrete specification in the Project Manual. Follow the instructions in paragraph 1402.1 on adding a paragraph in Section 01040. Also, we want to include a penalty for accepted under-strength concrete. Include the following language in the cast-in-place concrete specification:

> "If the structural members are accepted on the basis of tests other than the original cylinder tests, the Contractor shall compensate DGS for the Contractor's failure to meet specified strength requirements by paying to DGS one hundred ($100) dollars per cubic yard for each one hundred pounds per square inch below the specified strength. The original laboratory-cured 28 day test cylinder results only shall be used to determine the difference between specified and furnished strengths."

SECTION 1404 - UNIT MASONRY ASSEMBLIES SPECIFICATIONS

1404.1 DGS REQUIREMENTS. In order to avoid 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. See Chapter 15 of this Manual for a copy of the L&I ruling.

SECTION 1405 - STRUCTURAL STEEL SPECIFICATIONS

1405.1 DGS REQUIREMENTS. In order to avoid the requirement in Chapter 17 – Special Inspections of the IBC for "continuous" inspection of high-strength bolting in slip-critical connections, the Professional 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. See Chapter 15 of this Manual for a copy of the L&I ruling.

SECTION 1406 - ARCHITECTURAL SPECIFICATIONS

1406.1 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.

1406.2 ROOFING WARRANTY. The Professional shall include the following paragraphs in the Roofing Section to specify DGS requirements regarding the Contractor's warranty for roofing work.

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, 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, floors, 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, 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.

1406.3 FINISH HARDWARE. The Professional shall include the following series of paragraphs in the Finish Hardware Section to specify DGS requirements regarding non-proprietary 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 as manufactured by Best Lock Corporation, Falcon Lock Co., or Arrow Lock Corp., and shall be a factory recorded continuation or extension of an existing keying system previously furnished by these manufacturers 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 uncombinated cores and key blanks needed. The combinating 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, Best, Falcon or Arrow, so that cores can be combinated 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. Masterkeyed 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.

SECTION 1407 - HVAC SPECIFICATIONS

1407.1 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.

1407.2 GENERAL. 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 Refrigeration
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. PA Air Quality Act, Title 5 (DEP)
12. Pennsylvania L&I Boiler Code
13. Pennsylvania Code – Health Department
14. PA 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.

1. Heat conservation systems to be considered:

    a. Heat Recovery Systems
    b. Heat Pumps
    c. Heat Storage Systems
    d. Passive or Active Solar Heating
    e. Wind
    f. Geothermal

2. No air conditioning system should require a dedicated system for reheat, without approval of the Department.
3. Areas requiring twenty-four (24) hour cooling should be considered as separate systems.
4. All ductwork shall be specified with a 3% maximum leakage with external insulation.
5. Resistance type heating shall not exceed 40% of heating requirements. Combination systems must be used.
6. Heat pumps shall not provide less than 60% of design heat losses with SEER 11 or greater.
7. An energy analysis is required to assure that the systems and its components use minimum energy. Specifications should require this from equipment manufacturers.

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.

1. NOTE: The Professional shall consult with the Using 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 his 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 and all subsequent Submissions.

1407.3 HVAC SPECIFICATION GUIDE. Guide information and direction may be distributed to the Professional by the E/A during design.

A. A complete HVAC specification outline 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 Using Agency, Project, and/or Department even if beyond the code requirements.

1407.4 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 DGS 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), NEEB 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 Balancing Firm 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 NEEB. 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.

1407.5 COAL-FIRED BOILERS. When a new boiler plant or new coal fired boiler is required for the project, boiler specifications will be based on the make and model number the Professional's design is based upon and limited to other manufacturers and models that meet the physical and technical requirements of the boiler. The specifications shall include test procedures and performance data forms, See Chapter 15.

A. BOILER SYSTEM TEST PROCEDURE

1. The following procedure shall be included verbatim in the contract specification. Tests shall confirm compliance with the guaranteed performance and capacity requirements, and DEP's particulate stack emission requirements.
2. It shall be the responsibility of the Professional to oversee the testing of the boiler, and provide direction as required. Note that the test shall be conducted by the Contractor under the supervision of the boiler manufacturer and test confirmed by the representative of the Department. Fuel and operating personnel shall be provided by the Institution.
3. Final test report shall be prepared by the Contractor's testing agent, reviewed and approved by the Professional and the Using Agency's representative.

B. BOILER TESTS AND ADJUSTMENTS

1. General:

a. The Professional shall make sure that the Contractor will be responsible for the coordination of all boiler testing procedures, and will indicate the responsibility of other parties on all phases of equipment involved.
b. The work includes preparations, boil-out, break-in, testing, adjustments and instructions for the boiler system.
c. Fuel, water and water treatment chemicals for all operations as outlined herein will be furnished by the Institution. Boiler manufacturer shall furnish boil-out chemicals to Contractor along with boil-out instructions.

d. Special equipment required to conduct the tests shall be furnished by the boiler manufacturer unless otherwise indicated herein.
e. Tests shall be conducted by a qualified testing agent of the HVAC Contractor under the supervision of the boiler manufacturer and a representative of the Department. The boiler manufacturer shall support the Contractor during the performance and capacity tests by providing personnel and equipment as necessary and specified herein. The boiler manufacturer's start-up Engineer shall be regularly employed in that capacity by the boiler manufacturer, and will supervise both the performance and capacity tests and report back to the Professional.
f. In the event that the boiler stoker unit and associated fans and dust collector fail to meet the guarantees, the boiler manufacturer shall make alterations to the units, at its own expense, and conduct further tests until they comply with the contract to the satisfaction of the Professional and DGS.

2. Boiler Operating Certificate:

a. The Professional must get approval of the design.
b. The attention of the Contractor is called to the requirement of a 'Boiler Operating Certificate', which must be obtained from the Boiler Division-Pennsylvania Department of Labor and Industry before start-up. A 'temporary' certificate will suffice.
c. The attention of the Contractor is called to the requirement for a 'Temporary Operating Permit', which must be obtained from the Pennsylvania DEP's Bureau of Air Quality Control prior to operating the boilers. A 'permanent' operating permit must be obtained upon demonstration of compliance with all applicable rules and regulations of DEP, including emission testing.

3. Boil-Out, Start-Up and Break-In: Professional to include under "Testing" in the HVAC specifications.

a. When the installation of the boiler systems (including boiler, stoker, dust collector, instrumentation, fans, piping systems, etc.) is completed, the Contractor shall dry out and boil-out the boiler in accordance with specific instructions of the boiler manufacturer. At the end of the boiling out period, the boiler shall be thoroughly drained, cleaned, and refilled with fresh chemically treated water.
b. The boiler unit shall then be slowly fired-up and placed on line under normal operating conditions by the Contractor and representatives of the manufacturers of the boilers, stokers, and combustion controls for a continuous period of not less than ninety-six (96) hours. Assistance may be available from the Institution during this break-in period. All operating components shall be tested, adjusted and calibrated by the manufacturers and as approved by the Professional. Operating instructions shall be given by the manufacturer's representatives to the operating personnel of the Institution during the break-in period. The Contractor shall provide certification that the operators have been adequately instructed in the operation of the equipment. These operating personnel shall be designated by name in writing by the Institution. During the break-in period, the boilers shall be tested for turn-down range.

c. The manufacturer's representatives shall be present during the break-in period to make final operating adjustments, and to instruct operating personnel of the Institution as follows:

1) Boiler	5 days (Boiler Manufacturer)
2) Stoker	5 days (Boiler Manufacturer)
3) Controls & Instrumentation	5 days (Contractor)
4) Forced Draft, Induced Draft	1 day (Boiler Manufacturer)

The above instruction shall be scheduled to provide the training for each of three (3) shifts of boiler operators at the Institution.

4. Test Procedures:

a. The accuracy of all instruments used to record data shall be certified by the Contractor.
b. The performance and capacity tests shall be observed by the Professional, who shall submit a written report of the operation of the boiler systems and systems components to Department. This report shall have the written endorsement of the Institution and the approval of the Professional, Department and the Agency.
c. Contractor shall remedy without cost to the Department, any equipment provided under its contract which fails to function properly due to defective materials, workmanship, or application.
d. The Contractor shall arrange for steam and water flow recorders to be checked for proper calibration by a representative of the instrument manufacturer before and after the performance capacity tests.
e. The Contractor shall arrange for the coal weighing device to be tested and sealed prior to the performance and capacity tests by the County Department of Weights and Measures, if not already available.
f. New charts shall be placed on each boiler meter recorder at the beginning of the performance and capacity tests. At the conclusion of the tests, the charts shall be turned over to the Department and copies will be included as part of the test report.
g. All permanently installed recorders and indicating gauges shall be read hourly or as required during the performance and capacity tests, and shall be entered by operating personnel of the Using Agency on forms furnished by the Department.
h. The boiler manufacturer shall provide a throttling calorimeter to determine steam quality, and an indicating pyrometer to measure flue gas temperature at boiler outlet. Readings from each instrument shall be obtained hourly or as required during the test period by the boiler manufacturer's representatives. The attention of the Contractor is called to the requirements for a 3/4" tapped opening in the boiler steam pipe for the attachment of a steam calorimeter and a temporary 4" pipe containing a globe valve to connect to the steam main and extend outside the building, with muffler if required, for disposing of excess steam produced during the tests.
i. The stoker manufacturer shall use an Orsat meter to determine the oxygen, carbon dioxide and carbon monoxide in the flue gas at the boiler outlet. Readings shall be obtained and recorded hourly or as required during the test period by the stoker manufacturer's representative.
j. A representative sample shall be taken from the stoker hopper, if possible, or from the discharge of a conveyor in the coal handling system each hour during

the test period. This sample should be taken in such a manner that it represents the size and quality of coal burned, collected at a rate of 2 lbs. per ton of coal burned. The sample for the test should be consolidated into a gross sample. This gross sample shall be quartered down to approximately 12 lbs. by a method specified in the DGS, Bureau of Standards Sampling Procedure (SPBS-28). The 12 lbs. should be contained in four (4) standard coal sample cans. One (1) of these cans shall be sent to the Bureau of Standards Coal Laboratory for analysis. One (1) part of the sample shall be given to the Contractor if the Contractor should requests independent laboratory analysis. The two (2) remaining parts of each sample shall be retained by the Using Agency, should a check test be required. The coal analysis report will include:

1) Moisture
2) % Ash, dry
3) BTU per lb., dry
4) Ash softening temperature
5) % Volatile matter

k. A sample of the furnace ash shall be taken every four (4) hours. These increments shall be consolidated into a gross sample representing each test day's operation.
l. A sample increment of the fly ash from the collector hoppers shall be taken every four (4) hours or at a frequency that will enable a representative sample to be taken. These samples of ash and fly ash will be analyzed by the Bureau of Standards sampling procedure and the carbon combustible in each reported.
m. The Boiler manufacturer shall make an hourly observation of stack capacity and shall record the results in percent capacity. Readings shall be made by an EPA or DEP certified smoke reader.
n. At the conclusion of the performance and capacity tests, all data, records and analysis shall be submitted to the Professional for its review and comment.

5. Performance Testing:

a. Upon completion of the calibration period, a performance test of the boiler system shall be scheduled. This test shall be conducted to determine the ability of the system components to satisfy the overall requirements of the system, including efficiency, air pollution, turn-down range, reliability, operational compatibility and safety.
b. The primary intent of the performance test is to determine the ability of the boiler system components to satisfy the requirements of the system under normal Institution steam demand.
c. The boiler system performance test shall be conducted over a continuous ninety-six (96) hour period, beginning at approximately 8:00 A.M. on the date specified by the Department.
d. The performance test shall be conducted by the Contractor and supervised by a boiler start-up Engineer and the Professional. A qualified representative of the boiler manufacturer shall be present during the performance test. Boiler operating personnel shall be provided by the Institution.
e. The boiler system performance test shall be conducted under normal Institutional steam demands, using normal Institutional coal supply.

f. Representatives of the boiler, stoker, control equipment, and dust collector suppliers shall be present during the performance test.
g. Boiler efficiency during the boiler system performance test shall be calculated on an input-output basis.
h. Data shall be obtained hourly or as required during the performance test, and shall be entered by operating personnel of the Institution on forms to be furnished by the Department. This data shall be utilized in the completion of the test report.
i. The boiler manufacturer shall provide special test equipment required to conduct the performance test as hereinafter specified. The accuracy of all instruments used to record data must be certified by the Contractor. The attention of the Contractor is called to the requirement for a 3/4" tapped opening in the boiler steam outlet for attachment of a steam throttling calorimeter. The exact location will be determined by the boiler manufacturer.

6. Capacity Test:

a. The capacity test shall be conducted for a period of at least two (2), but not more than four (4) hours within forty-eight (48) hours of the completion of the performance test.
b. Boiler operating personnel for the capacity test shall be provided by the Institution. Test shall be conducted by the Contractor under the supervision of the boiler manufacturer's start-up Engineer.
c. Representatives of the boiler, stoker and control equipment manufacturers shall be present for the full time of the capacity test.
d. Capacity test shall be made to the maximum boiler load which can be obtained up to the limits of the boiler feedwater pumping system, or boiler rated capacity, whichever occurs first.
e. During the capacity test the steam produced shall be delivered to the Institution main header and condensate to be returned to the boiler to its maximum operating return capabilities.
f. To fulfill capacity test the Contractor shall install a 4" pipe containing a globe valve to dispose of excess steam.
g. Boiler efficiency during the boiler system capacity test shall be calculated on an input-output basis.
h. No guarantee of efficiency will be required during capacity test.
i. Data shall be obtained hourly, or as required during the performance test, and shall be entered by operating personnel of the Using Agency on forms to be furnished by the Department. This data shall be utilized in the compliance of the test report.

7. Particulate Emission Stack Test:

a. The boiler manufacturer shall conduct three (3) particulate emission stack tests to determine quantity of particulate matter emissions from the boiler unit. Testing shall be conducted at sampling ports located in the (existing) boiler plant stack.
b. Emission testing can only be conducted during the period from (_____) through (_____) when the Institution's steam demand can be totally and completely satisfied by the new boiler unit only. The Contractor must consider this in developing its schedule for project completion and ultimate acceptance by the Department. **[Dates to be determined with the Agency]**

c. The (existing) stack sampling ports may not be accessible. The Contractor must arrange for the temporary erection of scaffolding to allow for emission testing. Sampling ports are approximately (_____) abovegrade as indicated on the drawings. **[Field verify]**
d. Stack testing and analysis shall be performed in accordance with DEP's Chapter 139 'Sampling and Testing'. Compliance with the requirements of Chapter 123 'Standards for Contaminants' and the 'Policy for Best Available Technology Determination for Coal-Fired Boilers' shall be demonstrated by testing.
e. Stack testing shall be performed OVER 150% while the boiler is operating at not less than (_____) nor more than (_____) lbs./hr. of steam capacity or as specified by DEP. **[Verify steam rates with DEP]**
f. Within fifteen (15) days of conducting this testing, the Contractor shall submit six (6) copies of the test report to the Professional for review and distribution to appropriate agencies. The test report shall include test results, boiler operating data, descriptions of test methods and equipment, calculations, field data sheets and observations. Particulate emissions shall be reported as lbs. per hour, grains per dry standard cubic ft. of gas as lbs. per million BTU's of boiler heat input.
g. If particulate emissions exceed allowable levels specified by DEP, the boiler manufacturer and the Contractor shall correct the deficiency and conduct additional testing as required to secure a final operating permit without cost to the Department.

8. Boiler System Test Report:

a. Upon completion of the boiler system test, the Contractor's testing agent shall prepare a formalized final test report in format as presented hereinafter.
b. The Professional shall review the test results, provide appropriate comments and recommendations regarding deficiencies, if any, noted in the report by the testing agent. After all corrections have been made by the boiler manufacturer and/or Contractor, the Professional shall approve same. The Using Agency shall approve the report, indicating acceptance of the boiler system.
c. Six (6) copies of the report shall be provided to the Department for distribution as follows: one (1) copy to the Using Agency, two (2) copies to the Bureau of Construction, one (1) copy to E/A, one (1) copy to the Institution and one (1) copy to Penn State Facilities Engineering Institute (PSFEI).
d. Sample boiler test report will be provided to the Contractor, upon request, by the Department as a guide for report format.
e. Copy of 'Permit to Operate', received by the Bureau of Air Quality and Waste Management, shall be included. Original permit shall be turned over to the Institution.
f. The boiler test report shall include the following, prepared by the Contractor's testing agent:

1) Cover Page
2) Approval Page
3) Project Number, Location and Date of Test
4) List of equipment with Manufacturer, Model and Serial Numbers of all major equipment
5) Copy of Contractor Predicted Performance (Bid Package)
6) Laboratory Fuel Analysis
7) Summary of Operating Data

8) Sample of Calculations
9) Observation, discussion of all observations prior to, during and after test
10) Summary

g. Prepared by Professional:

1) Recommendations

h. Attachments:

1) Daily test data sheets
2) Daily steam flow recorder charts
3) Laboratory fuel analysis report
4) Daily representative attendance sheets
5) Copy of 'Certificate to Operate'

1407.6 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 services.

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, turning vane, and ATL 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 provided 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.

G. Approved fire and smoke sealant shall be used at all pipe penetrations of fire rated walls, floors and ceilings.

1407.7 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.".

1407.8 ABOVEGROUND STORAGE TANKS (AST) AND UNDERGROUND STORAGE TANKS (UST). 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 Pennsylvania Act 1988-32.

A. All removal, installation and repair operations shall employ DEP certified Contractors as required.

B. Upon the discovery of fuel contamination, notify Department for direction.

C. Stand-alone projects related to storage tanks shall be performed as a (.6) specialty contract.

D. All utility and regulatory permits, certifications and fees must be addressed and satisfied by the Contractor.

E. Adhere to the following requirements as a minimum:

1. Underground storage tank installation procedures shall in general conform to API recommended practices as well as DEP and PA Labor and Industry codes and regulations.

2. API Recommended Practice No. 1615 – Installation of USTs.
3. API Recommended Practice No. 1604 – Removal and Disposal of USTs.
   NOTE: Installation in Philadelphia County and Allegheny County shall further conform to their respective codes and regulations.
4. Provide STAGE I and STAGE II vapor recovery for gasoline.

F. Tank Requirements:

1. USTs shall be double-wall steel, 360^{o} containment meeting the requirements of STI-P3 and UL 58 or double-wall fiberglass conforming to UL 1316, and be provided with a remote emergency shut off switch, corrosion protection of all ferrous components, vehicle protection, spill containment, and overfill protection and impervious surfaces at fill and dispensing ports.
2. All ASTs shall conform to UL 142 as a minimum and be provided with a remote emergency shut off switch, product line anti-siphon valves, vehicle collision protection, spill containment, protection fence, and overfill protection.
3. Steel USTs shall be protected from exterior corrosion with 125 mils of fiberglass reinforced polyester resin meeting the requirements of ACT 100 or ACT 100U.
4. USTs shall be anchored to an adequately sized reinforced concrete hold-down pad.
5. Containment sumps will be utilized on all UST's with submersible pumping systems.
6. Inventory and leak detection for USTs and piping shall be done electronically.
7. All product lines shall be non-metallic, sloped back to the sump and have secondary containment. Include a provision for leak detection and flow restrictors.
8. The UST interstitial space and dispenser sumps shall be monitored for leaks.
9. Provide drop tube overfill protection and spill containment at fill port.

G. Drawing Requirements – As a minimum, the following information shall be indicated:

1. Site Plan:

   a. Topographic survey of site must conform to the PA Labor and Industry's area requirement stated in the Application for Approval. The plan must further indicate the location of all physical features and utilities, both aboveground and underground, relevant to the design, installation and demolition of the fuel facility.
   b. Indicate all USTs, associated piping/conduit systems and island/site facilities scheduled for removal or demolition.
   c. If a site assessment is necessary, develop an Environmental Boring Plan, from a copy of the Site Plan, indicating the location, depth and soil/ground sample tests for each environmental boring around the existing USTs.
   d. Adequate vehicle accessibility, stack-up and entrance/egress patterns must be demonstrated for all anticipated truck types, Commonwealth fleet vehicles and the fuel delivery truck.
   e. Indicate the location, size and content of each UST/AST and the associated excavation/foundation.
   f. Stormwater management must be accommodated with the area affected by excavation or facility construction.
   g. Property lines must be clearly represented.
   h. Indicate the location of any required existing or desired monitor/recovery wells.

i. UST manholes and sumps should be out of the normal path of vehicle traffic, protected from surface water flooding and designed to be immune from snowplow damage.
j. The extent and characteristics of all paving work shall be exhibited and defined.
k. Identify and label all piping/conduit routes.
l. Indicate all fencing modifications, gate installations and vehicle collision protection features.
m. Identify apron/canopy size and dispenser island equipment. Slope apron to prevent surface water accumulation.
n. Indicate the location of all ancillary equipment and systems required to support the location of the fuel facility.
o. Identify the intended location of Contractor parking, equipment/material storage and excavated soil storage/remediation operations.
p. Indicate a means for isolating escaped product within the stormwater system.

2. Detail Drawings:

a. Provide an elevation detail of pipe/conduit penetration of wall/foundation/sumps; specify cross-over intersection and backfill requirements.
b. Provide an elevation detail of excavation cross-sections indicating all dimensional and shoring/cutback requirements.
c. Provide uniform pea gravel backfill around USTs with a minimum 12" between the UST and the hold-down pad.
d. Provide elevation details of any required monitor/recovery wells.
e. Provide clear and precise details for canopy structure and island foundation.
f. Indicate accommodation for canopy rainwater runoff.
g. Provide elevation details of UST/hold-down pad attachment and pump sumps.
h. Provide an elevation section indicating fill, vent inventory/leak sensor locations, arrangement and interface without the UST/AST.
i. Locate the inventory sensor at the UST/AST midpoint.

3. Site Assessment Program: After accurate topographic and subsurface survey information is gained and integrated onto the Site Plan, the Professional may be asked to perform a site assessment, utilizing the results from laboratory analysis of soil/ground water samples, to determine the extent and constituents of soil/ groundwater fuel contamination. The site assessment program may consist of the following tasks as requested:

a. Development of an Environmental Boring Plan for the Department's review and approval.
b. On-site placement, direction and drilling of the environmental borings to ascertain the extent of soil and ground water contamination.
c. Professional on-site representation during the boring operations with the ability to perform additional discretionary environmental borings and monitor/recovery wells.
d. Applicable laboratory analysis of soil/ground water samples for specific constituents, existing MTBE and lead concentration from former leaded gasoline USTs. Consider full range target pollutant tests at the locations of new USTs.
e. Samples are not to be homogenized or taken at recurrent boring depths.
f. All results are to be recorded and submitted to the Department to serve as a baseline reference for the site.

g. Evaluation of current and seasonal high ground water elevations, gradient and soil recharge rates.
h. Provide a site assessment program summary report to include the results of the environmental tests, the testing methodology and an assurance plan from the testing laboratory.
i. If necessary develop DEP required Site Characterization Report and/or Remedial Action Plan based on contamination after report is complete.
j. Interim remedial actions shall be executed upon the confirmation of reportable contamination.
k. The specifications/drawings will direct the Contractor to dispose or remediate a finite amount of contaminated soil.
l. Dewatering the excavation and proper disposal of any captured water, whether contaminated or not, is the Contractor's responsibility.
m. The removal and disposal of contaminated soil and ground water will be supervised by the Professional.
n. Any contamination of an extensive nature, or from other sources, not covered by the drawings or specifications, shall be considered outside the scope of the project. The Professional shall notify the Department and the Using Agency of the results.

H. Procedure Information:

1. See guide specifications. These shall be used and may be applicable for the specific project requirement.

2. Requirements:

a. Design Stage Procedure:

1) If applicable the Professional shall have the local or L & I Fire Marshal review and comment on proposed UST design and installation procedure with respect to Fire and Safety requirements. File Form SP-FP2 with Plan.
2) Such reviews and comments shall be filed with DGS with the Pre-Final Submission.
3) Such comments shall be incorporated into the contract documents.

b. Responsibility:

1) Professional may submit to Labor and Industry for review and comment, the proposed UST/AST design and installation procedure. Include in contract document complete requirement for UST/AST, regarding installation/ removal/registration, etc.
2) Contractor shall file for permit, for the Owner, with the Labor and Industry. The Owner is defined as the Institution on whose property the UST will be installed.
3) Register UST removal, installation and upgrade with DEP and obtain a registration number for each UST.
4) Provide registered certification from tank fabricator.
5) Install/Remove USTs by a certified UST installer/remover.
6) Have inspected, tested and certified by a certified UST Installation Inspector.

7) Submit certified statement regarding compliance with requirements for the proper disposal of tanks required to be removed.

I. Specification Guide Information – The following information shall be incorporated into the UST specifications. The Professional shall review and modify, as necessary, to suit the specific project requirements.

1. The Storage Tank and Spill Prevention Act of 1989:

a. The Pennsylvania Storage Tank and Spill Prevention Act of 1989 regulates all installation, modification, removal and inspection activities related to aboveground and underground storage systems.
b. Each Contractor shall comply with the requirements of the Storage Tank and Spill Prevention Act as it applies to this project.
c. Each Contractor, prior to commencement of any work, regulated by the Act, shall provide to the Department proof of certification by the Department of Environmental Protection as a certified installer or remover.
d. Each Contractor, prior to commencement of any work, regulated by the Act, shall provide to the Department proof of certification by the Department of Environmental Protection for the required certified Inspector on this project.

2. 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]

3. 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.

4. 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 1408 - PLUMBING SPECIFICATIONS

1408.1 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.

1408.2 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 generally includes the following:

    1. A complete system of cold and hot water piping and equipment with valved connections to all water-consuming equipment.
    2. A complete sanitary drainage system with trapped connections to all fixtures and equipment with extensions to 5’ beyond the building line.
    3. A complete rainwater drainage system with connections to all rainwater conductors within the building. Plumbing Contractor shall provide roof drains to General Contractor for installation. Roof drain selection shall be coordinated with the roof construction.
    4. A complete fire protection system with valved connections, including as applicable; wet and dry standpipe system, sprinkler systems, hose racks, hose valve outlets, siamese connections, and exterior fire hydrants. The Professional shall include and coordinate all sprinkler risers, mains, branch piping, valve stations, and fire pump installations. Any sprinkler requirements that require special attention to layout and location of sprinkler heads shall be noted on the drawings. All hazard classification with flow and area requirements shall also be indicated on the drawings. 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.

5. A complete system of gas piping to all gas consuming fixtures and equipment, including extension to 5' beyond the building line.
6. A complete compressed air system including compressors, accumulators, piping and valved connections to indicated equipment.
7. A complete vacuum system including pumps, piping and valved connections to all vacuum equipment.
8. A complete air-conditioning condensate drainage system with connections to all equipment, with extensions and indirect connections to storm or sanitary sewer system. If the condensate drains are provided under the HVAC Contract, the Plumbing Contractor shall provide appropriate indirect waste connections.
9. Furnishing and installing plumbing fixtures.
10. Furnishing and installing special equipment, complete, including but not limited to water softening equipment, filtering equipment for swimming pools, hydrotherapy pool equipment, and sterilizing equipment.
11. Rough-in only for kitchen, laundry, laboratory and hospital equipment.
12. A complete distilled water system with water still, pumps, piping and valved connections to all distilled water outlets.
13. All screen chambers, oil, grease and lint interceptors and grease traps within the building.
14. Testing, disinfection of water system, adjusting and placing in operation all systems installed.

B. The Professional shall comply with the latest applicable codes and regulations:

1. PA UCC – Pennsylvania Uniform Construction Code.
2. Fire Protection Systems – NFPA
3. Sprinklers NFPA 13
4. Life Safety Code – NFPA 101
5. Accessibility – UCC
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 Using 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 1409 - ELECTRICAL SPECIFICATIONS

1409.1 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.

1409.2 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 10 1

D. Pennsylvania UCC

E. Pennsylvania Code, Department of Health Regulations

F. City or Local Codes, as applicable

G. Accessibility – UCC

H. Other codes, as applicable

1409.3 SPREAD OF FIRE, OR PRODUCTS OF COMBUSTION. The design Project 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 DGS. Plastic conduit installed underground or in concrete encasement will be acceptable.

C. Non-metallic sheathed cable or armored cable is not to be used, except with special permission.

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.

1409.4 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.

1409.5 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. Electrical Contractor (EC):

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.

B. HVAC Contractor (HC):

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 (GC) 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.

* 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.

C. General Contractor (GC):

1. Install intake and exhaust air louver(s) furnished by HVAC Contractor.

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.

1409.6 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).

1409.7 MEDIUM VOLTAGE SHIELDED POWER CABLE AND FUEL 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 Using 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^{o}C for normal operation; 130^{o}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^{o}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.

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^{o}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/Conductor Size
2) And Type/Insulation Type and
3) Thickness/% Insulation Level/
4) Rated Voltage/MV-90/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^{o}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 Project Inspector 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/Conductor Size
2) And Type/Insulation Type and
3) Thickness/% Insulation Level/
4) Rated Voltage/MV-90/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^{o}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 real 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 Project Inspector 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 Using 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 Project Inspector for approval, and shall include the following:

      1) All readings shall be recorded and plotted on kilvoltmegohm 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 1410 - GUIDELINES FOR VERTICAL TRANSPORTATION SPECIFICATIONS

1410.1 PURPOSE. To specify construction materials, methods and contract requirements, determined to Professional to suit the project under design.

1410.2 CONSTRUCTION CONTRACT. Generally, the elevator construction would fall within the General Construction (.1) contract; however, when the extent of the elevator work is large, it may be determined by Department that the elevator construction shall be a separate Prime Contract.

1410.3 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. Pennsylvania Elevator Regulations, Department of Labor and Industry Code

C. National Electrical Code – NFPA 70

D. PA UCC

E. Accessibility - UCC

F. City and Local Codes, as applicable

G. Other codes and/or regulations as applicable

1410.4 DESIGN AND SPECIFICATIONS. The following items shall be incorporated into the design and appropriate section of the specifications, as applicable.

A. Elevator guide rails shall be planed steel tees. Round rails are not acceptable.

B. Roller guides shall be provided. Slide shoes are not acceptable.

C. Installation shall comply with NEI recommendations and ADA requirements for the individuals with disabilities.

D. Specify emergency power for all passenger elevators in hospitals, and other buildings requiring same by code.

E. Specify battery or standby power in buildings not required to have same, when directed to do so by DGS at the request of the Using Agency.

F. Specify electrically-operated lowering devices for hydraulic elevators when the elevators are not connected to a battery or standby power source.

G. Specify fireman's control, when required by code.

H. Specify emergency lighting in all elevator cars.

I. Specify telephones in all elevators.

J. 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.

K. Specify coordination with the HVAC Contractor to provide ventilation and heating of elevator machine rooms.

L. Specify that hole-less elevators are not acceptable under this specification. (NOTE: With special permission, hole-less elevators may be specified. This must be determined prior to preparation of the specifications.)

M. 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.

SECTION 1411 - HAZARDOUS MATERIALS SPECIFICATION

1411.1 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.

1411.2 GUIDANCE SPECIFICATIONS. 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 in Chapter 15 of this Manual.

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 Project Coordinator.

1411.3 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 1412 - BUILDING PLAQUE

1412.1 DGS PLAQUE. All Projects, including new and renovation projects, shall include a standard cast aluminum DGS building plaque, as per the Exhibit in Chapter 15. The Professional shall include the plaque detail and specifications in the Construction Documents. Consult the Using Agency for exact location of the plaque, and indicate location on the Drawings.

CHAPTER 15

PROJECT INFORMATION EXHIBITS

pennsylvania
DEPARTMENT OF GENERAL SERVICES

BUREAU OF
ENGINEERING AND ARCHITECTURE

PROJECT PROCEDURE MANUAL

2010 EDITION

BUREAU OF ENGINEERING AND ARCHITECTURE
PROJECT PROCEDURE MANUAL

TABLE OF CONTENTS
FOR
CHAPTER 15 - PROJECT INFORMATION EXHIBITS

ORIENTATION CONFERENCE

An Orientation Conference with the Professional and Using Agency is conducted by E/A to review DGS procedures and confirm the terms of 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 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, and anticipated Additional Services and consultants beyond Basic Services.
e. The Professional's initial site visit (generally during this visit the Using Agency's initial program information and project goals will be presented to the Professional).

The Professional's representative at the Orientation Conference must be empowered to make commitments. The Professional shall examine the General Conditions of the Professional Agreement and the E/A Project Procedure Manual prior to the Orientation Conference, and bring 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. 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. Standards and Materials Checklist
d. Budget Office Letter
e. Request for Project Action
f. Project Program/Scope
g. Project-Related Handouts

INSTRUCTIONS FOR DGS INTERNET WEBSITE

Step-by-Step Instructions to obtain the following documents from the website:

1. Visit our Web Page at www.dgs.state.pa.us.

2. On the left side of the DGS Homepage, click on 'Construction and Public Works'.

3. On the left side of the screen, click '2010 Edition Design and Construction Documents'.

2010 BEA Procedure Manual
(searchable pdf document)

Professional Agreement
and
General Conditions, 2010 Edition

Instructions to Bidders, 2010 Edition

Construction Contract
and
General Conditions, 2010 Edition

Administrative Procedures, 2010 Edition

Division 1 – General Requirements, 2010 Edition

WORK ORDER PROPOSAL BREAKDOWN SHEET

This form is to be used in submitting Project Work Order Proposals.

Description of Work
Proposed To Be Performed: _____

COST ESTIMATE

Note: Refer to the Professional Agreement, for allowable billing rates for Additional Services.

a. Principal/Officer of the Firm:

_____ Hours @ _____ Per Hour = _____

b. Registered Architect/Professional Engineer:

_____ Hours @ _____ Per Hour = _____

c. Technical Staff:

_____ Hours @ _____ Per Hour = _____

d. Specification Writer:

_____ Hours @ _____ Per Hour = _____

e. Cost Estimator:

_____ Hours @ _____ Per Hour = _____

f. Draftsperson/CAD Operator:

_____ Hours @ _____ Per Hour = _____

g. Clerical/Secretarial:

_____ Hours @ _____ Per Hour = _____

List Other Personnel Categories:

Plus Breakdown of Reimbursables:

TOTAL COST ESTIMATE _____

POINT OF CONTACT TO REVIEW DGS DRAWINGS

FOR OUTSIDE PROFESSIONALS AND USING AGENCIES

Please contact the following office to make arrangements to sign out drawings as necessary:

Bureau of Professional Selections & Administrative Services
Project Control Division
Central File – Basement Headquarters Building
18th & Herr Streets
Harrisburg, Pennsylvania 17125
(717) 787-3674
(717) 787-6557

Please note:
DGS/Public Works will no longer provide printing services.

PROGRAMMING SUBMISSION

Probable Construction Cost Summary

Option _____

Project Number: _____ Date of Estimate: _____

SUMMARY OF COST ESTIMATE AND BREAKDOWN FOR PROGRAMMING SUBMISSION

PROJECT TITLE:

Location:

PROFESSIONAL'S FIRM NAME:

Address:

BASE CONSTRUCTION AMOUNT . . . . . $ _____

Ground (Bldg. Footprint) Area . . . . . _____ Sq. Ft.

Gross Floor Area (New Construction) . . . . . _____ Sq. Ft.

Gross Floor Area (Renovations) . . . . . _____ Sq. Ft.

SITE AND BUILDING COSTS

Site Improvements . . . . . $ _____

Building Construction . . . . . $ _____

A. TOTAL CONSTRUCTION COST . . . . . $ _____

Escalation to Mid-Point of Construction (tentative date) _____/_____/_____

_____ Months @ _____ % Per Month = Total _____%

B. TOTAL ESCALATION (CONSTRUCTION COST X TOTAL %) . . . . . $ _____

C. ESCALATED TOTAL CONSTRUCTION COST (A+B) . . . . . $ _____
(Cost shall not exceed 80-90% of Base Construction Amount)

(Escalated Total Construction Cost ÷ Gross Floor Area = $ _____ / Sq. Ft.)

DATE _____ PROFESSIONAL _____

(Signature)

PROGRAMMING SUBMISSION
General Information

Project Number: _____ Date: _____

DESCRIBE THE FOLLOWING:

1. Site (incl. Zoning)

2. Utilities

3. Exterior and Interior Building Materials

4. HVAC Requirements

5. Plumbing/Fire Protection Requirements

6. Electrical Requirements

SCHEMATIC DESIGN SUBMISSION
Probable Construction Cost Summary

Project Number: _____ Date of Estimate: _____

SUMMARY OF COST ESTIMATE AND BREAKDOWN FOR SCHEMATIC SUBMISSION

PROJECT TITLE:

Location:

PROFESSIONAL'S FIRM NAME:

Address:

BASE CONSTRUCTION AMOUNT . . . . . $ _____

SITE AREA AND COSTS

Total Improved Area . . . . . _____ Sq. Ft.

A. TOTAL IMPROVED SITE AREA COST . . . . . $ _____

BUILDING(S) AREA AND COSTS

Ground (Bldg. Footprint) Area . . . . . _____ Sq. Ft.

Gross Floor Area (New Construction) . . . . . _____ Sq. Ft.

Gross Floor Area (Renovations) . . . . . _____ Sq. Ft.

General Construction . . . . . _____ / Sq. Ft. = $ _____

HVAC . . . . . _____ / Sq. Ft. = $ _____

Plumbing . . . . . _____ / Sq. Ft. = $ _____

Electrical . . . . . _____ / Sq. Ft. = $ _____

Other . . . . . _____ / Sq. Ft. = $ _____

B. TOTAL BUILDING CONSTR. COST . . . . . _____ / Gross Sq. Ft. = $ _____

C. SITE & BUILDING COMBINED CONSTRUCTION COSTS (A+B) . . . .$ _____

Escalation to Mid-Point of Construction (tentative date) _____/_____/_____

_____ Months @ _____ % Per Month = Total _____%

D. TOTAL ESCALATION (CONSTRUCTION COST X TOTAL %) ……. $ _____

E. ESCALATED TOTAL CONSTRUCTION COST (C+D) …… $ _____
(Cost shall not exceed 80-90% of Base Construction Amount)

(Escalated Total Construction Cost ÷ Gross Floor Area = $ _____ / Sq. Ft.)

DATE _____ PROFESSIONAL _____
(Signature)

SCHEMATIC DESIGN SUBMISSION
General Construction

Project Number: _____ Date: _____

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

Additional Data by Architect

(add other info as necessary)

SCHEMATIC DESIGN SUBMISSION

General Construction (cont.)

Project Number: _____ Date: _____

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: _____ Date: _____

INTERIOR MATERIALS

Floors	
Base	
Wainscot	
Walls	
Ceilings	
Trim	

SCHEMATIC DESIGN SUBMISSION
General Construction (cont.)

Project Number: _____ Date: _____

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: _____ Date: _____

DESIGN CRITERIA

Proposed Use of Building	Number of Floors

Basement	Provisions for Future Expansion
☐ Full ☐ Partial ☐ None	☐ 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: _____ Date: _____

LIFE SAFETY DATA

1. Occupancy Classification

2. Total Occupancy

_____

3. Floor Occupancy

Basement _____ Third _____ Sixth _____

First _____ Fourth _____ Seventh _____

Second _____ Fifth _____ Eighth _____

4. Type of Construction

Corridor Doors

Fire Doors

Stairway Doors

2. Lighting Requirements

Corridor

Exit

6. Protective Equipment Location

Portable Extinguishers
(Size and Type)

Water Source and Pressure

SCHEMATIC DESIGN SUBMISSION
HVAC Requirements

Project Number: _____ Date: _____

HEATING

1. SCOPE AND DESIGN CRITERIA

2. TYPE OF SYSTEM

   Fuel

   Fuel Storage

VENTILATING

1. SCOPE AND DESIGN CRITERIA

2. TYPE OF SYSTEM

AIR-CONDITIONING

a. SCOPE AND DESIGN CRITERIA

b. TYPE OF SYSTEM

SYSTEM CONTROLS

1.

MISCELLANEOUS EQUIPMENT AND SPECIAL SYSTEMS

1. SPECIAL EXHAUST SYSTEMS

2. HEAT RECOVERY EQUIPMENT

3. HUMIDITY CONTROL EQUIPMENT

SCHEMATIC DESIGN SUBMISSION
Plumbing Requirements

Project Number: _____ Date: _____

PLUMBING

1. GAS
   - Source
   - Meter Location
   - Building Distribution

2. WATER
   - Source
   - Meter Location
   - Building Distribution
   - Domestic Hot Water

3. SANITARY SEWAGE
   - Building Sewerage
   - Disposition of Sewerage

4. ROOF DRAINAGE
   - Roof Drainage
   - Disposition

5. PLUMBING FIXTURES
   - Lavatories
   - Water Closets
   - Urinals
   - Etc.

6. FIRE PROTECTION
   - Water Source and Pressure
   - Sprinklers
   - Standpipes
   - Fire Hose Cabinets
   - Hose

SCHEMATIC DESIGN SUBMISSION
Electrical Requirements

Project Number: _____ Date: _____

ELECTRICAL

INCOMING SERVICES (Coordinate with Respective Utility Companies or Agencies Having Authority)

1. POWER
   a. Distribution Voltage
      Scope
      Method and System
      Materials
   b. Utilization Voltage(s)
      Scope(s)
      Method(s) and System(s)
      Material(s)
   c. Applicable Rate Schedules

2. TELEPHONE

3. OTHERS, such as:
      Central Fire Alarm
      Central Control
      Data
      Etc.

3. EMERGENCY LIGHTING

DESIGN DEVELOPMENT SUBMISSION
Probable Construction Cost Summary

Project Number: _____ Date of Estimate: _____

SUMMARY OF COST ESTIMATE AND BREAKDOWN FOR DESIGN DEVELOPMENT SUBMISSION

PROJECT TITLE:

Location:

PROFESSIONAL'S FIRM NAME:

Address:

BASE CONSTRUCTION AMOUNT . . . . . $ _____

SITE AREA AND COSTS

Total Improved Area . . . . . _____ Sq. Ft.

A. TOTAL IMPROVED SITE AREA COST . . . . . $ _____

BUILDING(S) AREA AND COSTS

Ground (Bldg. Footprint) Area . . . . . _____ Sq. Ft.

Gross Floor Area (New Construction) . . . . . _____ Sq. Ft.

Gross Floor Area (Renovations) . . . . . _____ Sq. Ft.

General Construction (from Breakdown) . . . . . $ _____

HVAC (from Breakdown) . . . . . $ _____

Plumbing (from Breakdown) . . . . . $ _____

Electrical (from Breakdown) . . . . . $ _____

Other (if applicable) . . . . . $ _____

B. TOTAL BUILDING CONSTRUCTION COST . . . . . $ _____

C. SITE & BUILDING COMBINED CONSTRUCTION COSTS (A+B) . . . . $ _____

Escalation to Mid-Point of Construction (tentative date) _____/_____/_____

_____ Months @ _____ % Per Month = Total _____%

D. TOTAL ESCALATION (CONSTRUCTION COST X TOTAL %) ……. $ _____

E. ESCALATED TOTAL CONSTRUCTION COST (C+D) …… $ _____
(Cost shall not exceed 80-90% of Base Construction Amount)

(Escalated Total Construction Cost ÷ Gross Floor Area = $ _____ / Sq. Ft.)

DATE _____ PROFESSIONAL _____
(Signature)

DESIGN DEVELOPMENT SUBMISSION
Cost Estimate Breakdown

Project Number: _____ Date: _____

GENERAL CONSTRUCTION COST ESTIMATE BREAKDOWN

SITE CONSTRUCTION WORK

Demolition	$_____
Excavation, Trenching, Grading and Fill	$_____
Planting, Seeding and Sodding	$_____
Fences	$_____
Bituminous Paving	$_____
Concrete Paving	$_____
Site Utilities:	$_____
Water	$_____
Sewer	$_____
Storm	$_____
Gas	$_____
Storm Water Management System	$_____
Soil Erosion and Sedimentation Control	$_____
	$_____
	$_____
	$_____
	$_____
	$_____
	$_____
	$_____
	$_____
	$_____
	$_____
	$_____
	$_____
	$_____
TOTAL (To Summary)	$_____

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: _____ Date: _____

GENERAL CONSTRUCTION COST ESTIMATE BREAKDOWN

BUILDING CONSTRUCTION WORK

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	$_____
(add other items as necessary)	$_____
SUBTOTAL for Building Construction	$_____
SUBTOTAL for Site Construction (from Previous Page)	$_____
GENERAL CONSTRUCTION TOTAL (To Summary)	$_____

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: _____ Date: _____

HVAC, PLUMBING & ELECTRICAL COST ESTIMATE BREAKDOWN

HEATING, VENTILATING & AIR-CONDITIONING WORK

HVAC Work on Site (Steam Service, Geothermal)	$ _____
HVAC Work in Building	$ _____
Primary Equipment	$ _____
Terminal Equipment	$ _____
Piping	$ _____
Ductwork	$ _____
Controls	$ _____
TOTAL (To Summary)	$ _____

PLUMBING WORK

Domestic Water Piping	$ _____
Roof Water Piping	$ _____
Sanitary Piping	$ _____
Other Piping	$ _____
Plumbing Fixtures	$ _____
Domestic Water Piping	$ _____
TOTAL (To Summary)	$ _____

ELECTRICAL WORK

Electrical Service Work (From point of attachment to utility company, to and including the main secondary disconnect)	$ _____
Anticipated Utility Company Fees	$ _____
Electrical Work on Site (Site Lighting)	$ _____
Other Work on Site	$ _____
Light and Power Distribution (Building)	$ _____
Other Systems (Building)	
Fire Alarm	$ _____
Telephone	$ _____
Data	$ _____
Emergency	$ _____
Other	$ _____
TOTAL (To Summary)	$ _____

TOTAL FOR HVAC, PLUMBING & ELECTRICAL $ _____

DESIGN DEVELOPMENT SUBMISSION
General Construction

Project Number: _____ Date: _____

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

Additional Data by Architect

(add other info as necessary)

DESIGN DEVELOPMENT SUBMISSION

General Construction (cont.)

Project Number: _____ Date: _____

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	

DESIGN DEVELOPMENT SUBMISSION
General Construction (cont.)

Project Number: ______________________ Date: ______________________

SITE WORK

Room or Space	Floor	Base	Wainscot	Wall	Ceiling

DESIGN DEVELOPMENT SUBMISSION
General Construction (cont.)

Project Number: _____ Date: _____

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

DESIGN DEVELOPMENT SUBMISSION

General Construction (cont.)

Project Number: _____ Date: _____

DESIGN CRITERIA

Proposed Use of Building	Number of Floors

Basement			Provisions for Future Expansion			
☐	☐	☐	☐	☐	☐	☐
Full	Partial	None	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

DESIGN DEVELOPMENT SUBMISSION

General Construction (cont.)

Project Number: _____ Date: _____

LIFE SAFETY DATA

1. Occupancy Classification

2. Total Occupancy

_____

3. Floor Occupancy

Basement _____ Third _____ Sixth _____

First _____ Fourth _____ Seventh _____

Second _____ Fifth _____ Eighth _____

4. Type of Construction

Corridor Doors

Fire Doors

Stairway Doors

5. Lighting Requirements

Corridor

Exit

6. Protective Equipment Location

Portable Extinguishers
(Size and Type)

Water Source and Pressure

DESIGN DEVELOPMENT SUBMISSION
HVAC Requirements

Project Number: _____ Date: _____

HEATING

1. SCOPE AND DESIGN CRITERIA

2. TYPE OF SYSTEM

   Fuel

   Fuel Storage

VENTILATING

1. SCOPE AND DESIGN CRITERIA

2. TYPE OF SYSTEM

AIR-CONDITIONING

1. SCOPE AND DESIGN CRITERIA

2. TYPE OF SYSTEM

SYSTEM CONTROLS

1.

MISCELLANEOUS EQUIPMENT AND SPECIAL SYSTEMS

1. SPECIAL EXHAUST SYSTEMS

2. HEAT RECOVERY EQUIPMENT

3. HUMIDITY CONTROL EQUIPMENT

DESIGN DEVELOPMENT SUBMISSION

Plumbing Requirements

Project Number: _____ Date: _____

PLUMBING

1. GAS
   - Source
   - Meter Location
   - Building Distribution

2. WATER
   - Source
   - Meter Location
   - Building Distribution
   - Domestic Hot Water

3. SANITARY SEWAGE
   - Building Sewerage
   - Disposition of Sewerage

4. ROOF DRAINAGE
   - Roof Drainage
   - Disposition

5. PLUMBING FIXTURES
   - Lavatories
   - Water Closets
   - Urinals
   - Etc.

6. FIRE PROTECTION
   - Water Source and Pressure
   - Sprinklers
   - Standpipes
   - Fire Hose Cabinets
   - Hose

DESIGN DEVELOPMENT SUBMISSION
Electrical Requirements

Project Number: _____ Date: _____

POWER

A. INCOMING SERVICES (Coordinate with Respective Utility Companies or Agencies Having Authority)

POWER

1. Distribution Voltage
   - Scope
   - Method and System
   - Materials

2. Utilization Voltage(s)
   - Scope(s)
   - Method(s) and System(s)
   - Material(s)

3. Applicable Rate Schedules

TELEPHONE

OTHERS, such as:

1. Central Fire Alarm
2. Central Control
3. Data
4. Etc.

B. INTERIOR DISTRIBUTION SYSTEM(S)

1. Electrical Characteristics

2. Equipment Served, such as:
   - Motors
   - Fluorescent Fixtures
   - Incandescent Fixtures
   - Etc.

3. Materials Employed, such as:
   - Conduit and Cable
   - Bus-Duct
   - Panel Boards
     - Circuit Breakers
     - Fuses
     - Etc.
   - Motor Control Centers
   - Underfloor Duct
   - Etc.

DESIGN DEVELOPMENT SUBMISSION
Electrical Requirements (cont.)

Project Number: _____ Date: _____

LIGHTING

C. LIGHTING SYSTEMS

INTERIOR – type to be employed

AREA	DESCRIPTION
Office	Lamp Recessed Troffer with Low Brightness Acrylic Lens, Providing _____ F.C.
Etc.	Etc.

EXTERIOR – type to be employed

AREA	DESCRIPTION
Building Floodlighting	Ground Mounted I-Q
Etc.	Etc.

SPECIAL, such as:

Signs
Stage
Etc.

D. MOTORS AND MOTOR CONTROLS

DESIGN DEVELOPMENT SUBMISSION
Electrical Requirements (cont.)

Project Number: _____ Date: _____

OTHER SYSTEMS

E. EMERGENCY SYSTEMS – such as:

Power
Lighting
Critical Equipment
Etc.

F. MISCELLANEOUS EQUIPMENT – such as:

Kitchen
Laundry
Computer
X-Ray
Etc.

G. OTHER – such as:

Electrical Space Heating
Process Heating
Etc.

H. INTERIOR MISC. SIGNAL, COMMUNICATION & AUXILIARY SYSTEMS – such as:

Clock – Program - Intercom
Nurses Call
Security
Radio – Television
Fire Alarm (Check Sprinklers)
Etc.

I. GROUNDING

J. LIGHTNING PROTECTION

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION

Probable Construction Cost Summary

Base Bid No. _____

Project Number: _____ Date of Estimate: _____

SUMMARY OF COST ESTIMATE AND BREAKDOWN FOR INTERIM C. D. SUBMISSION

PROJECT TITLE:

Location:

PROFESSIONAL'S FIRM NAME:

Address:

BASE CONSTRUCTION AMOUNT . . . . . $ _____

SITE AREA AND COSTS

Total Improved Site Area . . . . . _____ Sq. Ft. or Acres

Ground (Bldg. Footprint) Area . . . . . _____ Sq. Ft.

Gross Floor Area (New Construction) . . . . . _____ Sq. Ft.

Gross Floor Area (Renovations) . . . . . _____ Sq. Ft.

ESCALATION CALCULATION

Escalation to Mid-Point of Construction (tentative date) _____/_____/_____

_____ Months @ _____ % Per Month = Total _____%

GENERAL CONSTRUCTION COSTS	Current	Escalated
Improved Site Area Cost (from Breakdown) . . .	$ _____	$ _____
Building Construction Cost (from Breakdown) .	$ _____	$ _____
A. TOTAL GENERAL CONSTRUCTION COST		$ _____

BUILDING SYSTEMS COSTS	Current	Escalated
HVAC (from Breakdown)	$ _____	$ _____
Plumbing (from Breakdown)	$ _____	$ _____
Electrical (from Breakdown)	$ _____	$ _____
B. TOTAL BUILDING SYSTEMS COST		$ _____
C. TOTAL CONSTRUCTION COSTS (A+B)		$ _____

(Escalated Total Construction Cost ÷ Gross Floor Area = $ _____ / Sq. Ft.)

DATE _____ PROFESSIONAL _____

(Signature)

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION

Cost Estimate Breakdown

Project Number: _____ Date: _____

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								
SUBTOTAL								
BUILDING 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								
SUBTOTAL								
				TOTAL (To Summary)				

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: _____ Date: _____

HVAC COST ESTIMATE BREAKDOWN

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Quantity	Unit	Unit	Total	Unit	Total	Unit	Total
General Conditions								
Excavation		C.Y.						
Backfill		C.Y.						
Rock Excavation		C.Y.						
Concrete Anchors		Ea.						
Misc. Concrete		--------						
Sleeves – Size		Ea.						
Printing		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.						
Underground		--------						
Insulated		--------						
Conduit – Size		L.F.						
Other								
				TOTAL (To Summary)				

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: _____ Date: _____

PLUMBING COST ESTIMATE BREAKDOWN

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Quantity	Unit	Unit	Total	Unit	Total	Unit	Total
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								
				TOTAL (To Summary)				

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: _____ Date: _____

ELECTRICAL COST ESTIMATE BREAKDOWN

Item Description SERVICE AND FEEDERS	Quantities		Material Cost		Labor Cost		Total Estimate	
	Quantity	Unit	Unit	Total	Unit	Total	Unit	Total
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								
				TOTAL (To Summary)				

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

Base Bid No. _____

Project Number: _____ Date of Estimate: _____

SUMMARY OF COST ESTIMATE AND BREAKDOWN FOR CONSTRUCTION DOCUMENTS SUBMISSION

PROJECT TITLE:

Location:

PROFESSIONAL'S FIRM NAME:

Address:

BASE CONSTRUCTION AMOUNT . . . . . $ _____

SITE AREA AND COSTS

Total Improved Site Area . . . . . _____ Sq. Ft. or Acres

Ground (Bldg. Footprint) Area . . . . . _____ Sq. Ft.

Gross Floor Area (New Construction) . . . . . _____ Sq. Ft.

Gross Floor Area (Renovations) . . . . . _____ Sq. Ft.

ESCALATION CALCULATION

Escalation to Mid-Point of Construction (tentative date) _____/_____/_____

_____ Months @ _____ % Per Month = Total _____%

GENERAL CONSTRUCTION COSTS	Current	Escalated
Improved Site Area Cost (from Breakdown) . . .	$ _____	$ _____
Building Construction Cost (from Breakdown) .	$ _____	$ _____
A. TOTAL GENERAL CONSTRUCTION COST		$ _____

BUILDING SYSTEMS COSTS	Current	Escalated
HVAC (from Breakdown)	$ _____	$ _____
Plumbing (from Breakdown)	$ _____	$ _____
Electrical (from Breakdown)	$ _____	$ _____
B. TOTAL BUILDING SYSTEMS COST		$ _____
C. TOTAL CONSTRUCTION COSTS (A+B)		$ _____

(Escalated Total Construction Cost ÷ Gross Floor Area = $ _____ / Sq. Ft.)

DATE _____ PROFESSIONAL _____

(Signature)

CONSTRUCTION DOCUMENTS SUBMISSION
Cost Estimate Breakdown

Project Number: _____ Date: _____

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								
SUBTOTAL								
BUILDING 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								
SUBTOTAL								
				TOTAL (To Summary)				

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: _____ Date: _____

HVAC COST ESTIMATE BREAKDOWN

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Quantity	Unit	Unit	Total	Unit	Total	Unit	Total
General Conditions								
Excavation		C.Y.						
Backfill		C.Y.						
Rock Excavation		C.Y.						
Concrete Anchors		Ea.						
Misc. Concrete		--------						
Sleeves – Size		Ea.						
Printing		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.						
Underground		--------						
Insulated		--------						
Conduit – Size		L.F.						
Other								
				TOTAL (To Summary)				

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: _____ Date: _____

PLUMBING COST ESTIMATE BREAKDOWN

Item Description	Quantities		Material Cost		Labor Cost		Total Estimate	
	Quantity	Unit	Unit	Total	Unit	Total	Unit	Total
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								
				TOTAL (To Summary)				

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: _____ Date: _____

ELECTRICAL COST ESTIMATE BREAKDOWN

Item Description SERVICE AND FEEDERS	Quantities		Material Cost		Labor Cost		Total Estimate	
	Quantity	Unit	Unit	Total	Unit	Total	Unit	Total
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								
				TOTAL (To Summary)				

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

Project Number:_____ Phase _____ Part _____ Submission Date: _____

Project Title: _____

_____

(The Professional shall check the box for each item included in this Submission.
If any item is not included, provide a letter of explanation for missing items.)

1	❑ Transmittal Letter (w/ this Programming Submission Checklist attached)	Five (5) copies
2	❑ Programming Documents (incl. site requirements and bldg. space requirements)	Five (5) copies
3	❑ Sets of Conceptual Drawings	Five (5) sets
4	❑ Programming Submission Probable Construction Cost Summary w/ Project Information sheet (See Chapter 15)	Five (5) copies
5	❑ Statement of Expected Availability of Required Utilities: ○ Electric ○ Telephone ○ Storm Sewer ○ Water ○ TV Cable ○ Other ○ Gas ○ Sanitary Sewer ○ Other	Five (5) copies
6	❑ Statement on Site Restrictions (See Chapter 3)	Three (3) copies
7	❑ Photographs of Proposed Site of New Buildings/Additions	Three (3) copies
8	❑ Report on Status of LEED Efforts (if applicable)	Three (3) copies
9	❑ Report on Status of Current and Anticipated Additional Services (if applicable)	Three (3) copies
10	❑ Additional Items as applicable (list items in Transmittal Letter)	Three (3) copies

❖ Note: All the submission items listed above shall be bound separately; DO NOT bind together.
❖ Note: For more detailed descriptions of the items listed above, see Chapter 3 of the E/A Project Procedure Manual.

SCHEMATIC SUBMISSION CHECKLIST

Project Number:_____ Phase _____ Part _____ Submission Date: _____

Project Title: _____

_____

(The Professional shall check the box for each item included in this Submission. If any item is not included, provide a letter of explanation for missing items.)

1	❑ Transmittal Letter (w/ this Schematic Submission Checklist attached)	Five (5) copies
2	❑ Code Review and Analysis	Five (5) copies
3	❑ Schematic Submission Probable Cost Summary w/ Project Information sheets (See Chapter 15)	Five (5) copies
4	❑ Schematic Design Drawings w/ Cover Sheet	Five (5) sets
5	❑ Notification Letters to All Utility Companies (include reply letters if available): ○ Electric ○ Telephone ○ Storm Sewer ○ Water ○ TV Cable ○ Other ○ Gas ○ Sanitary Sewer ○ Other	Five (5) copies
6	❑ Fuel Feasibility Study (w/ Coal Non-Use Justification, where applicable)	Three (3) copies
7	❑ Structural Engineer's Initial Subsurface and Related Site Investigation Reports w/ Professional's Request for Proposals for Geotechnical Services	Three (3) copies
8	❑ Initial Report on Site Restrictions	Three (3) copies
9	❑ List of Required Regulatory Approvals/Permits – Status Report (See Chapter 15)	Five (5) copies
10	❑ Initial Contact Letter to PHMC	Two (2) copies
11	❑ Report on Status of LEED Efforts (if applicable)	Three (3) copies
12	❑ Report on Status of Current and Anticipated Additional Services (if applicable)	Three (3) copies
13	❑ Additional Items called for in Chapter 4 of E/A Procedures Manual, and as applicable (list items in Transmittal Letter)	Three (3) copies
14	❑ Marked-Up Programming Submission Documents from DGS	All

❖ Note: All the submission items listed above shall be bound separately; DO NOT bind together.
❖ Note: For more detailed descriptions of the items listed above, see Chapter 4 of the E/A Project Procedure Manual.

DESIGN DEVELOPMENT SUBMISSION CHECKLIST

Project Number:_____ Phase _____ Part _____ Submission Date: _____

Project Title: _____

_____

(The Professional shall check the box for each item included in this Submission.
If any item is not included, provide a letter of explanation for missing items.)

1	❑ Transmittal Letter (w/ this Design Development Submission Checklist attached)	Five (5) copies
2	❑ Code Review and Analysis (if changed)	Five (5) sets
3	❑ Design Development Submission Probable Construction Cost Summary w/ Project Information sheets (See Chapter 15)	Five (5) copies
4	❑ Outline Specifications for All Prime Contracts w/ one Completed Specification Section	Five (5) sets
5	❑ Design Development Design Drawings w/ Cover Sheet	Five (5) sets
6	❑ Confirmation Letters from All Utility Companies	Five (5) copies
7	❑ List of Required Regulatory Approvals/Permits – Status Report (See Chapter 15)	Five (5) copies
8	❑ Subsurface Investigation and Geotechnical Report	Three (3) copies
9	❑ Structural Engineer's Report on Selection of Structural & Foundation Systems	Three (3) copies
10	❑ Preliminary Engineering Calculations: ○ HVAC ○ Plumbing ○ Fire Protection	Two (2) copies
11	❑ Preliminary Electrical Engineering Calculations	Two (2) copies
12	❑ Report on Hazardous Materials Survey Results	Three (3) copies
13	❑ Response Letter from Pennsylvania Historical and Museum Commission	Two (2) copies
14	❑ Report on Status of LEED Efforts (if applicable)	Three (3) copies
15	❑ Report on Status of Current and Anticipated Additional Services (if applicable)	Three (3) copies
16	❑ Additional Items as called for in Chapter 5 of E/A Procedures Manual, and as applicable (list items in Transmittal Letter)	Copies as Required
17	❑ Marked-Up Schematic Submission Documents from DGS	All

❖ Note: All the submission items listed above shall be bound separately; DO NOT bind together.
❖ Note: For more detailed descriptions of the items listed above, see Chapter 5 of the E/A Project Procedure Manual.

INTERIM CONSTRUCTION DOCUMENTS SUBMISSION CHECKLIST

Project Number:_____ Phase _____ Part _____ Submission Date: _____

Project Title: _____

_____

(The Professional shall check the box for each item included in this Submission.
If any item is not included, provide a letter of explanation for missing items.)

1	❑ Transmittal Letter (w/ this Interim Construction Documents Submission Checklist attached)	Five (5) copies
2	❑ Interim Construction Documents Submission Probable Construction Cost Summary (for each Base Bid) w/ Project Information sheets (See Chapter 15)	Five (5) copies
3	❑ Project Specifications (all Contracts bound together as a Project Manual)	Five (5) sets
4	❑ All Construction Drawings w/ Cover Sheet	Five (5) sets
5	❑ List of Required Regulatory Approvals/Permits – Status Report (See Chapter 15) with copies of all applications/approvals	Five (5) copies
6	❑ Notes from the Professional's Meeting w/ Construction Regional Director	Two (2) copies
7	❑ Report on Status of LEED Efforts (if applicable)	Three (3) copies
8	❑ Report on Status of Current and Anticipated Additional Services (if applicable)	Three (3) copies
9	❑ Additional Items as called for in Chapter 6 of the E/A Procedures Manual, and as applicable (list in Transmittal Letter)	Copies as Required
10	❑ Written Explanation of Any Revisions Requested But Not Made	Five (5) copies
11	❑ Marked-Up Design Development Submission Documents from DGS	All

❖ Note: All the submission items listed above shall be bound separately; DO NOT bind together.
❖ Note: For more detailed descriptions of the items listed above, see Chapter 6 of the E/A Project Procedure Manual.

CONSTRUCTION DOCUMENTS SUBMISSION CHECKLIST

Project Number:_____ Phase _____ Part _____ Submission Date: _____

Project Title: _____

_____

(The Professional shall check the box for each item included in this Submission.
If any item is not included, provide a letter of explanation for missing items.)

1	❑ Transmittal Letter (w/ this Construction Documents Submission Checklist attached)	Five (5) copies
2	❑ Code Review and Analysis (if changed)	Five (5) copies
3	❑ Construction Documents Submission Probable Construction Cost Summary (for each Base Bid) w/ Project Information sheets (See Chapter 15)	Five (5) copies
4	❑ Project Specifications (all Contracts bound together as a Project Manual)	Five (5) sets
5	❑ All Construction Drawings w/ Cover Sheet	Five (5) sets
6	❑ Report Summarizing the Status of All Utilities	Five (5) copies
7	❑ List of Required Regulatory Approvals/Permits – Status Report (See Chapter 15) with copies of all applications/approvals	Five (5) copies
8	❑ Geotechnical Report and All Other Reports (if changed or revised)	Two (2) copies
9	❑ Letter From Professional, confirming compliance with Geotechnical Consultant's Recommendations	Three (3) copies
10	❑ Final Engineering Calculations: ○ HVAC ○ Plumbing ○ Fire Protection ○ Electrical	Two (2) copies
11	❑ Proposed Construction Schedule Bar Chart, with: ○ Recommended Number of Calendar Days for Construction ○ Number of Calendar Days of Temporary Heat	Three (3) copies
12	❑ Proposed RFP for Quality Assurance Inspection and Testing Services	Two (2) copies
13	❑ Framed Professional Color Rendering w/ Picture File on CD	One (1) original
14	❑ Report on Status of LEED Efforts (if applicable)	Three (3) copies
15	❑ Written Explanation of Any Revisions Requested But Not Made	Five (5) copies
16	❑ Using Agency's Final Design Approval Letter	Three (3) copies
17	❑ Additional Items as called for in Chapter 7 of E/A Procedures Manual, and as applicable (list items in Transmittal Letter)	Copies as Required
18	❑ Marked-Up Interim C.D. Submission Documents from DGS	All

- ❖ Note: All the submission items listed above shall be bound separately; DO NOT bind together.
- ❖ Note: For more detailed descriptions of the items listed above, see Chapter 7 of the E/A Project Procedure Manual.

Submit Final Documents to L&I for UCC Review/Approval and Building Permit after you receive the Construction Documents Submission Acceptance Letter from the Department.

PROJECT MANUAL

(Volume X of X)

PROJECT NO. DGS 700-38 Phase 1

Contract No. DGS 700-38 Phase 1.1 – General Construction
Contract No. DGS 700 38 Phase 1.2 – H.V.A.C. Construction
Contract No. DGS 700-38 Phase 1.3 – Plumbing Construction
Contract No. DGS 700-38 Phase 1.4 – Electrical Construction

For

Construction of a Sample Receiving Room
Veterinary Diagnostic Laboratory
Harrisburg, Dauphin County, PA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

Xxxxxx X. Xxxxxxx, Governor
Xxxxxx X. Xxxxxxxx, Secretary

SEAL
&
SIGN

Date: (Same as Drawings)

Professional's Firm Name
1208 Center Drive, Suite 120, Camp Hill, PA 17011
Phone: (717) 555-3620 Fax: (717) 555-3622

TABLE OF CONTENTS

LIST OF DRAWINGS

NUMBER AND TITLE OF DRAWINGS

CS-1	Cover Sheet

GENERAL CONSTRUCTION CONTRACT (DGS XXX-XX PHASE 1.1)

CIVIL

C-1	Site Plan

ARCHITECTURAL

AHE-1	Site Utility Plan
A-1	First and Second Floor Plans – Demolition
A-2	Hazardous Materials
A-3	First and Second Floor Plans
A-4	First and Second Floor Reflected Ceiling Plans
A-5	Exterior Elevations
A-6	Building Sections
A-7	Wall Sections
A-8	Room Finish Schedule and Large Scale Plans
A-9	Door Schedule and Details
A-10	Stair Plans and Sections

STRUCTURAL

S-1	Foundation Plan
S-2	Second Floor Framing Plan
S-3	Structural Details and Notes

HEATING, VENTILATING & AIR-CONDITIONING CONSTRUCTION CONTRACT (DGS XXX-XX PHASE 1.2)

HEATING, VENTILATING & AIR CONDITIONING

AHE-1	Site Utility Plan
H-1	H.V.A.C. - Site Plan
H-2	H.V.A.C. – Demolition Plans
H-3	H.V.A.C. – Floor Plans

PLUMBING CONSTRUCTION CONTRACT (DGS XXX-XX PHASE 1.3)

PLUMBING

P-1	Plumbing - Site Plan
P-2	Plumbing - Demolition Plans
P-3	Plumbing - Floor Plans

FIRE PROTECTION

FP-1	Sprinkler Layouts
FP-2	Details

ELECTRICAL CONSTRUCTION CONTRACT (DGS XXX-XX PHASE 1.4)

ELECTRICAL

AHE-1	Site Utility Plan
E-1	Electrical - Site Plan
E-2	Electrical - Demolition Plans
E-3	Electrical - Floor Plans

The Following Statement MUST Be Inserted At The End Of The Project Manual List Of Drawings:

The Professional, when directed by the Department, will furnish from time to time, as the 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

---

[Note To Professional Regarding Drawing Sheet Designations: Use of the AIA drawing numbering system or other sheet designation systems may be permitted, with the Project Coordinator's approval.]

[Note To Professional Regarding Common Drawings: Drawings showing work of more than one (1) contract shall indicate the Contractor responsibilities on the Title Block, as shown on the sample Title Block in Chapter 15. If a Drawing is "multi-discipline", it must be included on the Drawing Lists of all Contracts for which work is indicates, both on the Drawing Cover Sheet and the Project Manual List of Drawings. Multi-discipline drawings shall only be used in exceptional cases, where substantial duplication of drafting can be avoided by their use.]

---

1 3/4" 3/4" 34 1/2" 5" 3/4" 28 1/2" 3/4"

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES

HARRISBURG, PENNSYLVANIA

Xxxxxx X. Xxxxxxx, Governor Xxxxxx X. Xxxxxxxx, Secretary

List Approval Numbers and Dates for each applicable Agency.

PROJECT NO. D.G.S. 578-12 PHASE 1
ERIE CIVIC HUMAN RESOURCES CENTER
ERIE, ERIE COUNTY, PENNSYLVANIA

(VOLUME OF)

COVER SHEET INSTRUCTIONS

- Cover Sheet layout may be varied as determined by the Project Professional; however, all pertinent information must be included with adjustments, as applicable to particular projects.
- Do not place lists of abbreviations, material legends or symbols on Cover Sheet.
- Include diagrammatic Project Location Map Vicinity Map, and Institutional Map or Campus Plan.

ARCHITECT / PROFESSIONAL
RIVERSIDE ARCHITECTURAL PARTNERSHIP
1234 MAIN STREET
ERIE, PA

PHONE: (918) 246-3208

STRUCTURAL ENGINEERING CONSULTANT
BIRKENSTOCK ENGINEERS
7890 NORTH SECOND AVENUE
PITTSBURGH, PA

MECHANICAL ENGINEERING CONSULTANT
BUTTONDOWN ENGINEERS
7654 EAST 42ND STREET
JOHNSTOWN, PA

INDEX TO DRAWINGS

CS-1 Cover Sheet

General Construction
Contract No. DGS 578-12 Phase 1.1

CIVIL DWGS.
C-1
C-2

ARCHITECTURAL DWGS.
AHE-1
A-2
A-3

STRUCTURAL DWGS.
S-1
S-2
S-3

H.V.A.C. Construction
Contract No. DGS 578-12 Phase 1.2

HVAC DWGS.
AHE-1
H-2
H-3

Plumbing Construction
Contract No. DGS 578-12 Phase 1.3

PLUMBING DWGS.
P-1
P-2
P-3

FIRE PROTECTION DWGS.
FP-1
FP-2
FP-3

Electrical Construction
Contract No. DGS 578-12 Phase 1.4

ELECTRICAL DWGS.
AHE-1
E-2
E-3

Cover Sheet title block (See full scale sample)

CODE APPROVALS

PROJECT LOCATION MAP

VICINITY MAP

CAMPUS/KEY PLAN

Drawings Listed in Index
APPROVED _____ DATE _____
Gary N. Foster, P.E., Director
Bureau of Engineering & Architecture
Department of General Services

SEAL
Professional's Signature Date

JOHN E. SMITH & ASSOCIATES
ARCHITECTS & ENGINEERS
208 MAIN STREET, SUITE 4
HARRISBURG, PENNSYLVANIA 17101

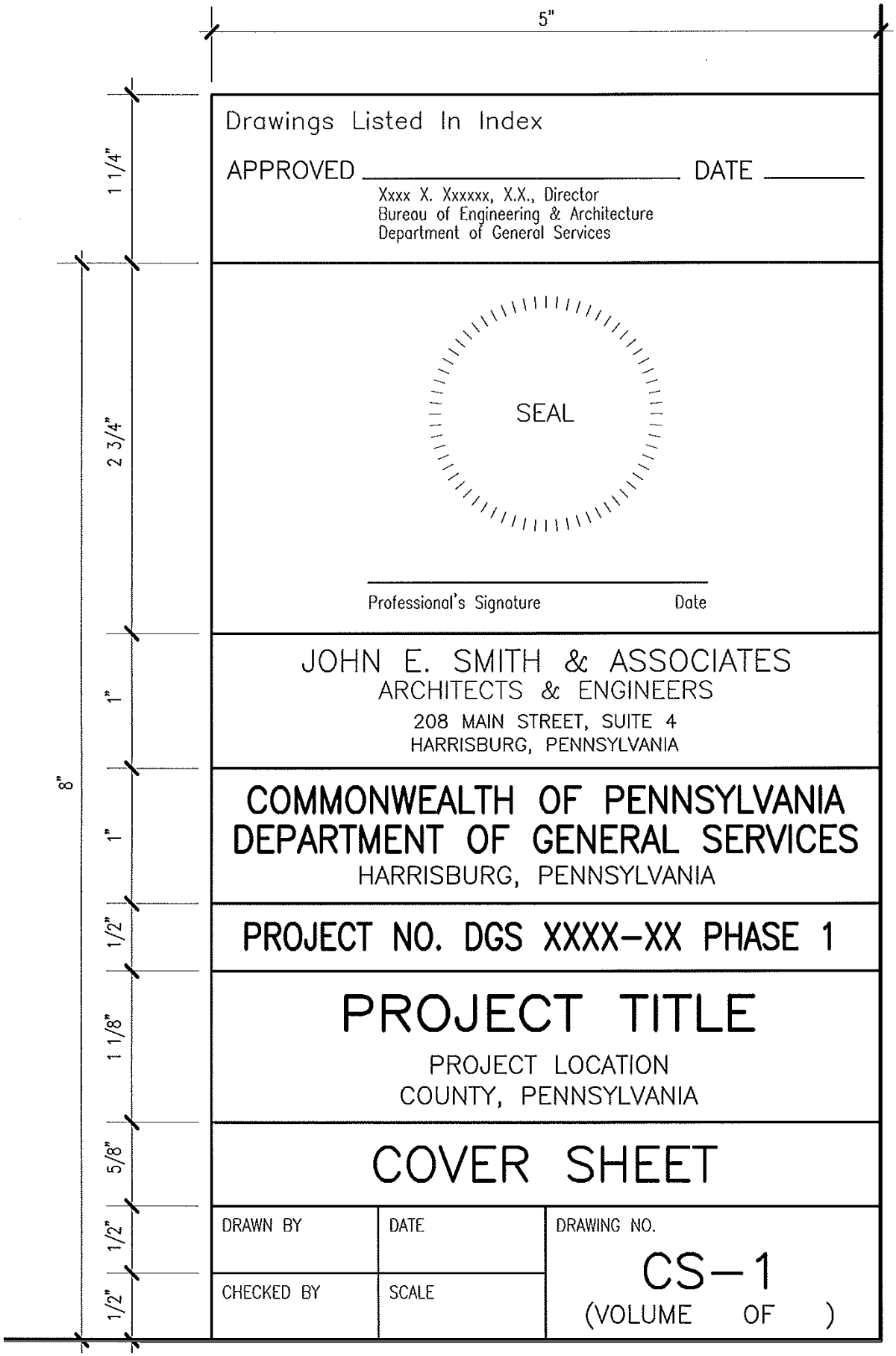
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

PROJECT NO. D.G.S. XXXX-XX PHASE 1

PROJECT TITLE
PROJECT LOCATION
COUNTY, PENNSYLVANIA
(VOLUME OF)

COVER SHEET

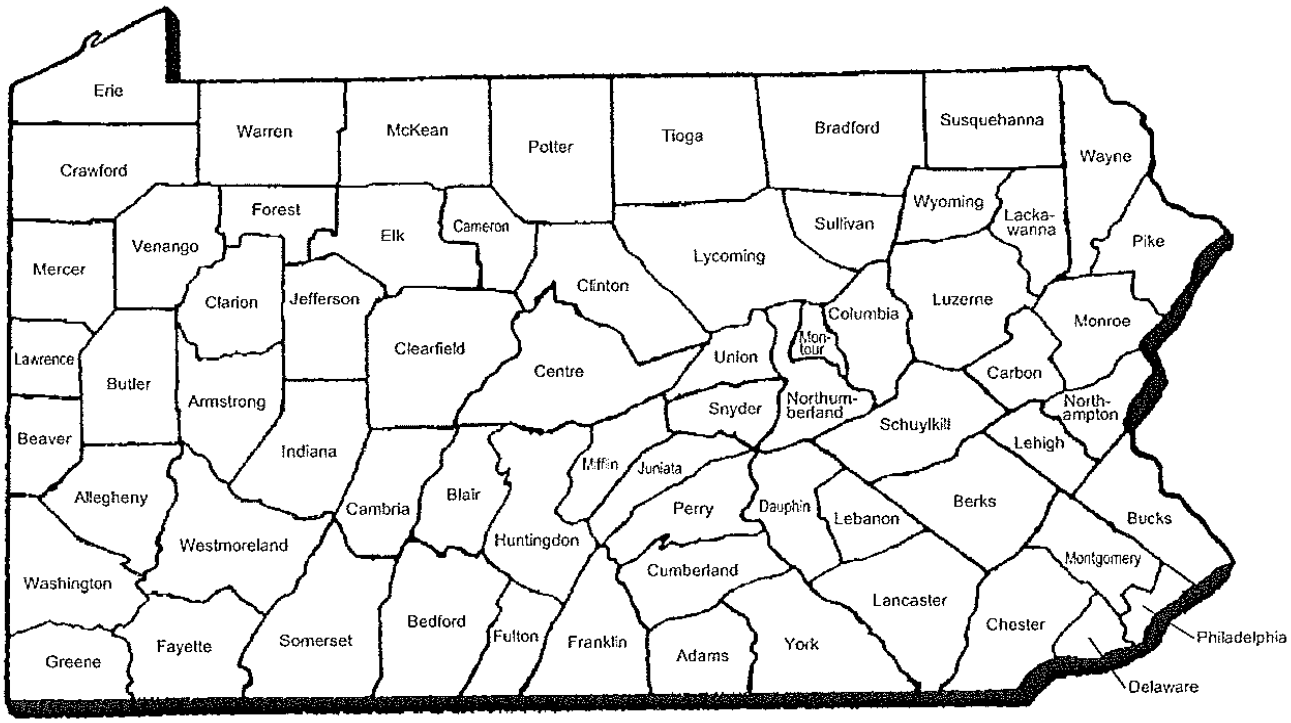
Drawn By	Date	Drawing No.
Checked By	Scale	CS-1

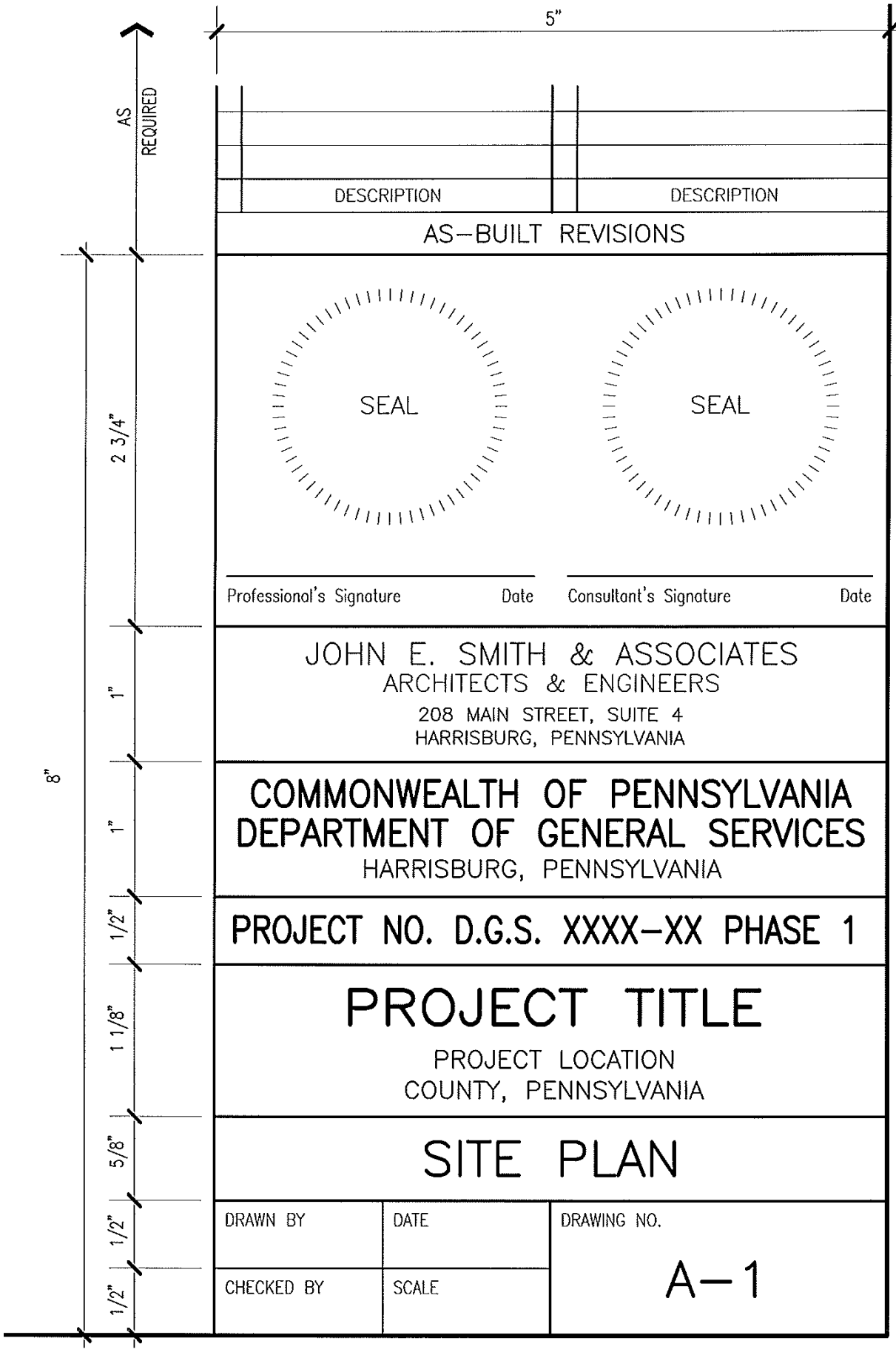


TITLE BLOCK: For use on the Cover Sheet, only. This is a sample. Edit with the correct information for Project No., Project Title and Location, Professional's Name & Address, Director's Name, Date, etc.

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.





TITLE BLOCK: For all drawings other than the Cover Sheet. This is a sample. Edit with the correct information for Project No., Project Title and Location, Professional's Name & Address, Drawing Title, Drawing No., Date, etc.

DESCRIPTION	DESCRIPTION

AS–BUILT REVISIONS

SEAL

Professional's Signature Date

SEAL

Consultant's Signature Date

JOHN E. SMITH & ASSOCIATES
ARCHITECTS & ENGINEERS
208 MAIN STREET, SUITE 4
HARRISBURG, PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG, PENNSYLVANIA

PROJECT NO. D.G.S. XXXX–XX PHASE 1

PROJECT TITLE

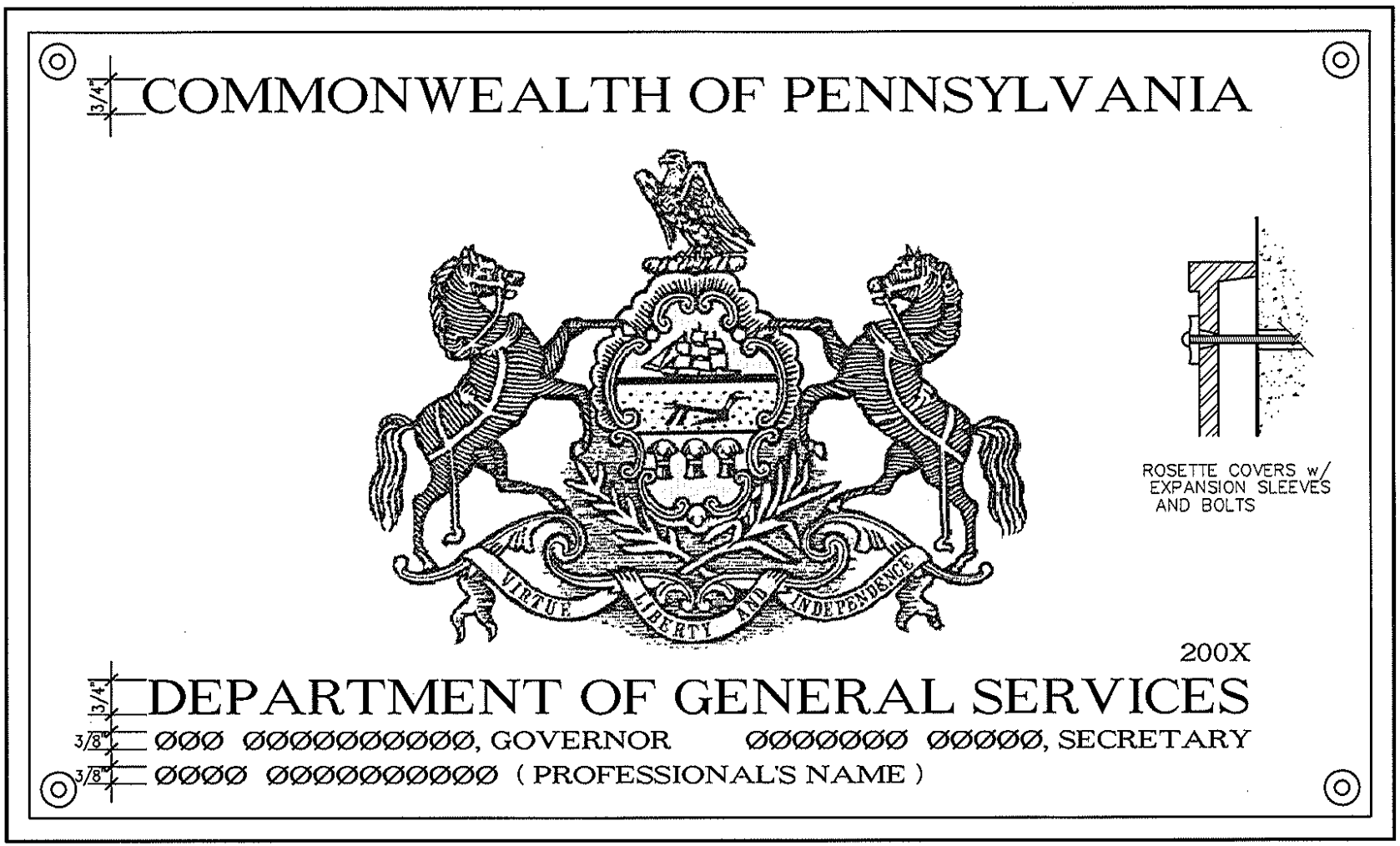
PROJECT LOCATION
COUNTY, PENNSYLVANIA

SITE PLAN

Note: Multi–discipline drawings, showing work of more than one (1) Contractor, shall indicate Contractor responsibilities by means of an addition to the Title Block, as shown on this page. Refer to Chapter 8 of the E/A Project Procedure Manual.

All work on this Drawing is to be included by the _____ Contractor, except work noted to be by: _____, _____, _____ Contractor.

DRAWN BY	DATE	DRAWING NO.
CHECKED BY	SCALE	A–1



STANDARD PLAQUE – CAST ALUMINUM

HELVETICA REG. LETTER STYLE, NAMES & DATE TO BE VERIFIED
(EVERY DGS PROJECT MUST HAVE A PLAQUE)
(VERIFY W/ DGS PROJECT COORDINATOR)

MONTHLY PROGRESS REPORT

Project Number: _____ Phase _____ Part _____ Time Period: _____

Project Title: _____

_____ Using Agency: _____

Professional Firm: _____

☐ PROGRAMMING ☐ SCHEMATIC ☐ DESIGN DEVELOPMENT

☐ INTERIM CONSTRUCTION DOCUMENTS ☐ CONSTRUCTION DOCUMENTS

DISCIPLINE AND PERCENTAGE OF COMPLETION

	Previous Reporting Period	This Reporting Period
o Site Visit / Programming:	_____ % complete	_____ % complete
o Civil:	_____ % complete	_____ % complete
o Architectural:	_____ % complete	_____ % complete
o Structural:	_____ % complete	_____ % complete
o Heating, Ventilating, Air-Conditioning:	_____ % complete	_____ % complete
o Plumbing:	_____ % complete	_____ % complete
o Fire Protection:	_____ % complete	_____ % complete
o Electrical:	_____ % complete	_____ % complete
o Specifications:	_____ % complete	_____ % complete
o Probable Construction Cost:	_____ % complete	_____ % complete

BRIEF DESCRIPTION OF PROJECT DEVELOPMENT (During This Reporting Period)

o Meetings Attended:

o Status of Surveys & Investigations:

o Work Related to Approvals:

o Status of Site Utilities (Incl. Utility Company Letters, Easements & Agreements):

o LEED Efforts:

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.

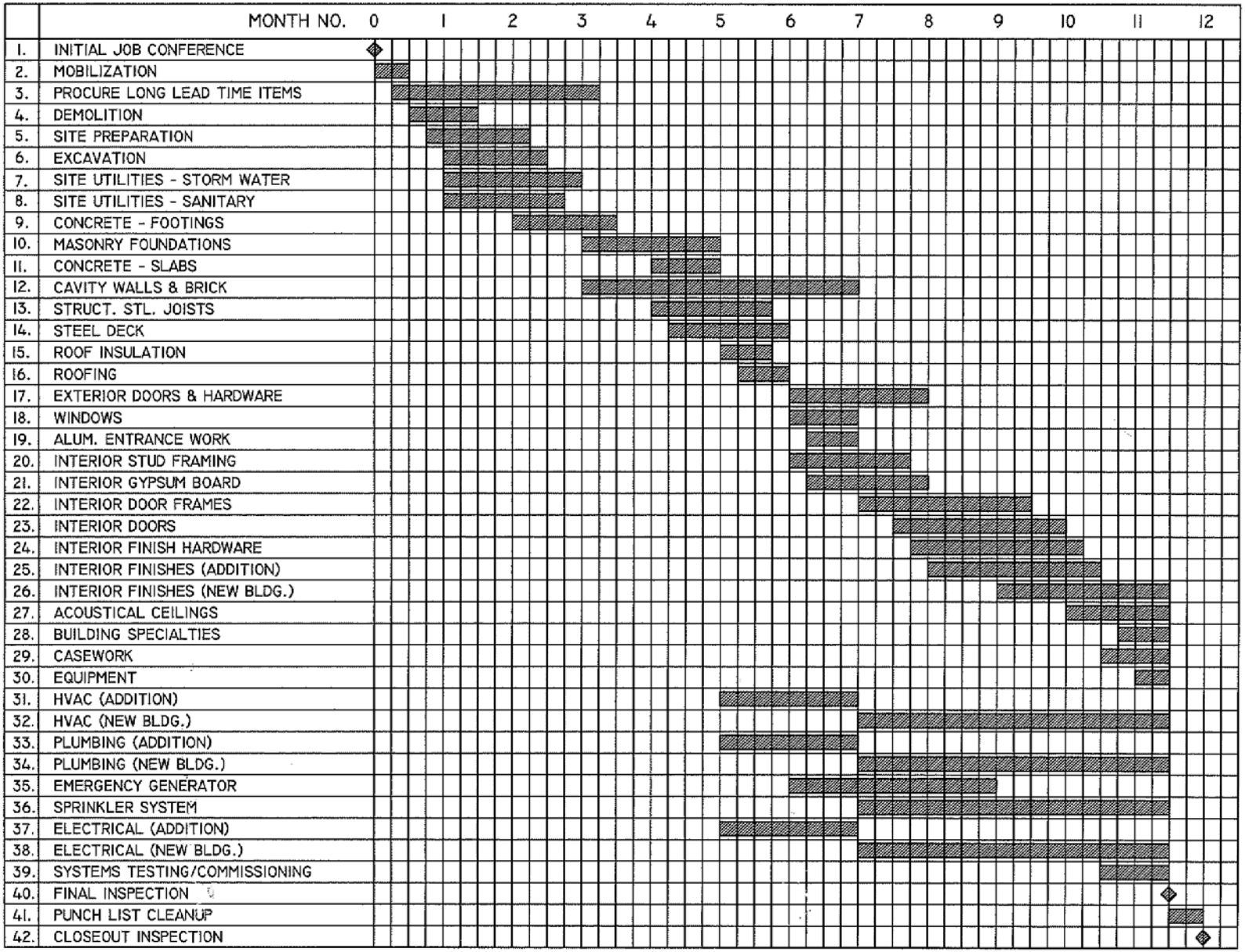
D.G.S. # (PROJECT NUMBER)

CONSTRUCTION SEQUENCE CHART

DATE:

RENOVATE POCONO HALL
WHITEHAVEN CENTER, TIOGA COUNTY, PA.

CALENDAR DAYS OF CONSTRUCTION TIME: 365 DAYS BASED ON CONSTRUCTION START DATE OF 05/00 CALENDAR DAYS OF TEMPORARY HEAT: 150 DAYS



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 _____ Part _____ Time Period: _____

_____

Project Location: _____ Using Agency: _____

Professional Firm: _____

☐ PROGRAMMING ☐ SCHEMATIC ☐ DESIGN DEVELOPMENT

☐ INTERIM CONSTRUCTION DOCUMENTS ☐ CONSTRUCTION DOCUMENTS

NO.	ITEM	GRANTING AUTHORITY	STATUS REPORT (Incl. anticipated approval date)
1	Local Approvals (as applicable)	Municipality	
2	Zoning Permit	Municipality	
3	Storm Water Mgt. Approval	Municipality/ County	
4	Soil Erosion and Sedimentation Control Permit	Municipality/ County	
5	Land Development Plan/ Subdivision Approval	Municipality/ County	
6	PA. UCC Approval (incl. Building Permit)	L & I	
7	Pa. Natural Diversity Index	D.C.N.R.	
8	Highway Occupancy Permit	PennDOT	
9	Sanitary Sewer Module	D.E.P.	
10	Underground Tanks Approval	L&I/ D.E.P.	
12	Flood Plain Approval	D.E.P.	
13	Wetlands Approval	D.E.P.	
14	Archaeological Approval	P.H.M.C.	
15	Historical Building Approval	P.H.M.C.	
16	NPDES Approval	D.E.P.	

Instructions to Professional: Add additional Permits/Approvals, as applicable, for complete list of all required for the Project.
This form is to be submitted with each submission.
Attach copies of all approval letters, as applicable.

PROPRIETARY REQUEST PROCEDURES

A. Using Agency sends a letter to the Professional requesting a Proprietary item to be specified in the Contract documents along with justification for making the request.

B. The Professional, after its review of the request from the Using Agency, writes a letter to the Bureau of Engineering and Architecture – Project Coordinator, indicating its approval/disapproval with an explanation of the UA's request - or the professional may initiate the request.

1. When a Professional recommends approval, it must provide along with the explanation, a cost estimate as follows:

   a. What the **Non-Proprietary Item costs if specified** (Comparative cost)
   b. What the **Proprietary Item will cost** (Comparative Cost)
   c. **Percentage value of the Proprietary Item compared to the total project cost**

2. The Bureau of Engineering and Architecture – Project Coordinator reviews and initiates a Proprietary Request to be signed by the Director. **(remember to include all disciplines)**

   a. A form memo must accompany the Proprietary Request to the Director stating the Coordinator's justification and the cost information, and include all disciplines.

3. Upon approval and signature by the Director, the form memo Request will be forwarded to the Deputy Secretary for review and approval by the Director's staff.

   a. If the Director has questions or disapproves it, it will be returned to the Coordinator, with explanation for disapproval.
   b. If disapproved, Coordinator will be responsible for contacting Professional and UA, indicating that the proprietary request is denied.

4. The Deputy Secretary will obtain review/approval from Public Works Legal Counsel.

5. The Deputy Secretary will approve/disapprove after obtaining Legal's approval/disapproval.

6. The Proprietary Request memo will be returned by the Deputy Secretary's Office to the BEA Director's Office:

   a. The Director's Staff will log out and give to Division Secretary to distribute.
   b. The Division Coordinator prepares a letter to the Professional notifying of the **approval/disapproval of the proprietary Item**.
   c. **If Proprietary Item is approved** – the Professional is to indicate in the appropriate section of specification that this is a proprietary specification by inclusion of the following paragraph:

      "The above item has been approved by the Department as a proprietary item. No other item will be accepted. Section 9.6 of the General Conditions to the Construction Contract does not apply to the above item."

REMINDER: All Proprietary Request Items need to be submitted to the Project Coordinator, prior to Design Development Approval.

DEPARTMENT OF GENERAL SERVICES
BUREAU OF PROFESSIONAL SELECTIONS & ADMINISTRATIVE SERVICES
18TH AND HERR STREETS
HARRISBURG, PENNSYLVANIA

BULLETIN NO. 1

on

PROJECT NO. DGS XXX-XX PHASE 1
PROJECT TITLE - NAME OF INSTITUTION - LOCATION
PROFESSIONAL'S NAME AND ADDRESS

BID DATE – WEDNESDAY, MONTH, DATE AND YEAR
TIME OF OPENING – 1:00 PM

ADMINISTRATIVE CHANGES

Item 1 - Attached to this Bulletin is a new Proposal Form for Contract No. DGS XXX-XX.PHASE 1.X, which must be used in lieu of the Proposal Form original issued.

[NOTE TO PROFESSIONAL: THIS BULLETIN IS GENERATED BY THE BUREAU OF PROFESSIONAL SELECTIONS AND ADMINISTRATIVE SERVICES, FOR ADMINISTRATIVE CHANGES TO THE PROJECT]

_____
XXXX X. XXXXXX, DIRECTOR
BUREAU OF PROFESSIONAL SELECTIONS
AND ADMINISTRATIVE SERVICES

Call the Professional's Office,
Telephone No. (XXX) XXX-XXXX, for
names of those who have secured plans and specifications.

PLEASE ACKNOWLEDGE RECEIPT OF FAX WITHIN 24 HOURS BY COMPLETING BOTTOM OF PAGE AND FAX TO (XXX) XXX-XXXX (INSERT DESIGN FIRM'S FAX NO).

_____ _____ _____
NAME TITLE DATE

_____
FIRM

DEPARTMENT OF GENERAL SERVICES
BUREAU OF PROFESSIONAL SELECTIONS & ADMINISTRATIVE SERVICES
18TH AND HERR STREETS
HARRISBURG, PENNSYLVANIA

BULLETIN NO. 1

on

PROJECT NO. D.G.S. XXX-XX PHASE 1
PROJECT TITLE - NAME OF INSTITUTION - LOCATION
PROFESSIONAL'S NAME AND ADDRESS

BID DATE – WEDNESDAY, MONTH, DATE AND YEAR
TIME OF OPENING – 1:00 PM

GENERAL CHANGES – ALL CONTRACTS

[for general items that apply to all contracts]

SPECIFICATION CHANGES – CONTRACT NO. DGS XXX-XX PHASE 1.X

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 1.X

Item 1 - Sheet H-4: Delete Demolition Note No. 3, in its entirety.

_____
XXXX X. XXXXXX, X.X., DIRECTOR
BUREAU OF ENGINEERING AND ARCHITECTURE

Call the Professional's Office,
Telephone No. (XXX) XXX-XXXX, for
names of those who have secured plans and specifications.

PLEASE ACKNOWLEDGE RECEIPT OF FAX WITHIN 24 HOURS BY COMPLETING BOTTOM OF PAGE AND FAX TO (XXX) XXX-XXXX (INSERT DESIGN FIRM'S FAX NO).

NAME	TITLE	DATE

FIRM

Date: _____

BOILER SYSTEM TEST REPORT

PROJECT NO. D.G.S. _____

_____(Coal, Gas, Oil)_____Boiler

_____(Institution)_____

PREPARED BY:

_____(Name)_____

_____(Representing)_____

REPORT DATE:

_____

SAMPLE GUIDE

Date: _____

REPORT OF BOILER SYSTEM TEST

The attached report of the Boiler System Test of Project No. D.G.S. _____, High Pressure Boiler, ____(Institution and Location)_____, has been prepared for the Department of General Services by _____(Contractor)_____.

SAMPLE

Testing Agent: _____

Witnessed By: _____
(Department of General Services)

Approved By: _____
(Professional)

Date: _____

Approved By: _____
(Department of - Agency -)

Date: _____

BOILER SYSTEM TEST REPORT

I. PROJECT IDENTIFICATION

Project No. D.G.S. _____

High Pressure Boiler

_____(Institution)_____

_____(Location)_____

Test Dates: _____

Test Dates: _____

II. SYSTEM DESIGN

A. Equipment (*)

Boiler: (Provide description, model number(s) and serial number(s) of all equipment)

Instrumentation:

Fuel Oil Service Pump:

Chemical Feed System:

(*) For coal fired included all associated system equipment – See _____.

B. Predicted Performance – Boiler/Burner – No. 2 Fuel Oil

	MINIMUM [1]	**MAXIMUM HOUR PEAK**
Actual evaporation, lbs/hr	10,000	70,000
Operation pressure, psig	150	150
Steam quality, %	99.5	99.5
Steam temperature at nozzle, ^{o}F	366	366
Feedwater temperature, ^{o}F	212	212
CO^2 at boiler outlet, %	12.8*	13.4*
Gas temperature at boiler outlet, ^{o}F	410	505
Total weight of exit gas, lbs/hr	11,310	77,955
Fuel burning rate, lbs/hr	650	4,480
Draft loss through boiler, WG	0.17	5.75
BTU release/ft^3 gross furnace volume	7,540	52,160
Efficiency complete unit, %	81.3	82.3

* Air Atomization

SAMPLE

[1] Data is to be provided by the boiler manufacturer and to be included as part of Contractor's bid package – See _____ for coal-fired boiler.

C. Fuel Analysis

Fuel Oil No. 2	
Specific gravity, API	0.844
Viscosity, SSU, @ 60°F	40.6
Sulfur, Wt. %, Maximum	0.15
Weight, lbs/gal	7.030
BTU, as fired	136,544

(Data from Laboratory Analysis)

III. OPERATING DATA – (Data as Result of Test)

Fuel Oil No. 2	
Evaporation	
Maximum lbs/hr	62,000
Minimum lbs/hr	5,000
Average lbs/hr	21,160
Total lbs/96 hrs	2,031.330
Steam Conditions	
Drum pressure, psig	150
Outlet temperature, °F	401
Enthalpy, saturated steam, BTU/lbs	1195.6
Purity, calorimeter, %	99.5
Feedwater Conditions	
Temperature to boiler, °F	224
Enthalpy, feedwater, BTU/lbs	192.17
Blowdown, % (approximately)	10.0
Fuel	
Consumed, gallons	16,452
BTU/gallons	136,544

IV. EFFICIENCY CALCULATIONS (Calculated for Test Data)

A. Fuel Oil No.2

$$\% \text{ Eff.} = \frac{W_s (h - hf) + W_b \times hfl}{V_o \times H_v} \times 100$$

Ws	Weight steam produced, lbs
Wb	Weight blowdown, lbs
Vo	Volume oil, gallons
H	Enthalpy saturated steam, BTU/lbs
Hf	Enthalpy feedwater, BTU/lbs
Hv	Heating value fuel, BTU/gal
Hfl	Enthalpy blowdown, BTU/lbs

SAMPLE

$$\% \text{ Eff} = \frac{2{,}031{,}330\ (1195.6 - 192.17) + 20{,}313\ (173.83)}{16{,}452 \times 136{,}544} \times 100 = 90.7$$

V. OBSERVATIONS (Information Prepared by Testing Agent)

A. The boiler performance test was conducted on _____(Date)_____ and _____(Date)_____, in accordance with the Department's standard boiler system testing procedures. The primary interest of the test was to determine the ability of the boiler system components furnished and installed under Project No. D.G.S. _____, to satisfy the requirements of the system under normal institutional steam demand. No. 2 fuel oil was burned for the entire ninety-six (96) hour test.

B. A capacity test of approximately one (1) hour duration was run. Difficulty was experienced at peak of _____ lbs. per hour. The lack of sufficient quantity of boiler feedwater resulted in this limitation of capacity.

C. The ninety-six (96) hour test was started at 10:00 A.M. on ____(Date)_____, and ended at 10:00 A.M. on _____(Date)_____. No difficulties were encountered other than the limitation as detailed in Paragraph B.

D. The calculated overall boiler efficiency was 90.7%. This obviously high calculated efficiency is believed related to: (1) the steam flow recorder calibration factor and need to change orifice size and (2) an oil flow meter range below that recommended by the meter manufacturer.

E. Difficulty was experienced in feeding the boiler at near peak conditions while using the existing Institution boiler feedwater system. Peak boiler steam capacity was not obtained.

F. The smoke density of combustion gases was satisfactory and in compliance with DEP regulations.

G. The boiler water chemical control was not satisfactory. Concentrations exceeded recommended control limits throughout the test.

H. The boiler chemical feed system failed on the third day of the test due to cutout of electrical overload in pump motor. Piping restrictions would cause such a condition.

I. The installation, operation and performance of the system components were satisfactory except as follows:

- ❖ Funnel drain to discharge overflow from injector was inadequately sized resulting in flooding boiler room floor. Drain piping size should be increased.

SAMPLE

- ❖ The orifice related to the Bailey steam flow recorder should be changed so as to have the recorded flow read direct without correction factor.

VI. SUMMARY (Information Prepared by Testing Agency)

A. The results of the test were satisfactory with the exception of items listed under VI above. Those items considered to be the responsibility of the Mechanical Contractor should be corrected promptly. Other items of a design nature are offered for consideration by the Authority. Some items are the responsibility of the Institution. All safety controls and lockout devices were tested and found to be satisfactory.

VII. RECOMMENDATIONS (Provided by Design Engineer)

- ❖ Shall verify test results are proper.
- ❖ Shall comment as to action to be taken regarding any noted deficiencies, if any.
- ❖ Shall recommend acceptance or qualified rejection of boiler and provide action to be taken.
- ❖ For coal fired boilers, the Contractor shall obtain from DEP, Bureau of Air Quality Management 'Certification to Operate'. A copy shall be included in report.

VIII. ATTACHMENTS

A. Data sheets, Boiler System Test (for each test day)

B. Steam Flow Recorder Charts (for each test day)

C. Fuel Analysis

D. List of Representatives in Attendance (for each test day)

E. Copy of 'Certificate to Operate'

SAMPLE

RECEIPT FOR GEOTECHNICAL REPORT

Project No. DGS _____

Project Title _____

_____

RECEIVED from _____,
retained Professional for the above-referenced Project, the Geotechnical Report, which is accepted by the undersigned under the following terms and conditions:

Any available data concerning subsurface materials or conditions, which is based upon soundings, test pits or test borings, has been obtained by the retained Professional primarily for its own use in designing this Project. The Test Boring logs contained within the Geotechnical Report are incorporated into the construction contract as Contract Documents. All remaining portions of the Geotechnical Report with exhibits is mad available on condition that its accuracy or completeness is not guaranteed by the Department or the Professional, and in no event is it to be considered as part of the Contract Documents. Contractors must assume all risks in excavating for this Project and shall not be entitled to rely on any subsurface information obtained from the retained Professional, which is not included in the Contract Documents.

[NOTE TO PROFESSIONAL: THIS FORM IS TO BE EXECUTED BY THE BIDDER, PRIOR TO RELEASE OF THE GEOTECHNICAL REPORT TO THE BIDDER]

_____

_____
(Bidder's Firm Name and Signature)

Dated _____

SAMPLE ELECTRICAL PANEL SCHEDULE

PANEL NAME:	PANELBOARD "S"	NO. OF POLES:	30
LOCATION:	STORAGE	TYPE:	NQOD
VOLTAGE:	120 / 208V, 3 PHASE, 4 WIRE	BRACING:	10 KAIC SYM
AMPACITY:	100 AMP	MAINS:	100 M.L.O.

LOAD SERVED	COND.	GND.	WIRE SIZE	WIRE NO.	AMPS	POLES	POLE NO.	KW PER PHASE A	KW PER PHASE B	KW PER PHASE C	POLE NO.	POLES	AMPS	WIRE NO.	WIRE SIZE	GND.	COND.	LOAD SERVED
AHU-2	3/4	10	10	3	20	3	1	1.0			2	3	20	2	12	12	3/4	AHU-1
							3		1.0		4							
							5			0.8	6							
EC-1	3/4	12	12	2	20	1	7	1.0			8	1	20	2	12	12	3/4	EC-2
EC-3	3/4	12	12	2	20	1	9		5.5		10	1	20	2	12	12	3/4	EC-4
EXTERIOR RECEPTACLE	3/4	12	12	2	20	1	11			5.5	12	1	20	2	12	12	3/4	CHILLER HEAT TAPE
RECEPTACLES	3/4	12	12	2	20	1	13	5.5			14	1	20	2	12	12	3/4	RECEPTACLES
FOLDING DOOR POWER	3/4	12	12	2	20	1	15		0		16	1	20	2	12	12	3/4	GARAGE DOOR POWER
CLOCK POWER/LIGHT	3/4	12	12	2	20	1	17		1.0	0	18	1	20	2	12	12	3/4	PUMPS CP-2, CP-3
CANOPY LETTERS	3/4	12	12	2	20	1	19	0		0.8	20	1	20	2	12	12	3/4	EXT. LIGHT CONTROL
RECEPTACLES	3/4	12	12	2	20	1	21	1.2			22	1	20	2	12	12	3/4	RECEPTACLES
RECEPTACLES	3/4	12	12	2	20	1	23		1.2		24	1	20	2	12	12	3/4	RECEPTACLES
RECEPTACLES	3/4	12	12	2	20	1	25			1.2	26	1	20	2	12	12	3/4	RECEPTACLES
RECEPTACLES	3/4	12	12	2	20	1	27	0.8			28	1	20	2	12	12	3/4	RECEPTACLES
RECEPTACLES	3/4	12	12	2	20	1	29		5.5		30	1	20					SPARE
BOOKSTORE TRACK	3/4	12	12	2	20	1	31			5.5	32	1	20	2	12	12	3/4	BOOKSTORE TRACK
BOOKSTORE TRACK	3/4	12	12	2	20	1	33	5.5			34	1	20					SPARE
BOOKSTORE TRACK	3/4	12	12	2	20	1	35		0		36	1	20	2	12	12	3/4	LOBBY DISPLAY TRACK
LOBBY DISPLAY TRACK	3/4	12	12	2	20	1	37			0	38	1	20	2	12	12	3/4	LOBBY DISPLAY TRACK
LOBBY DISPLAY TRACK	3/4	12	12	2	20	1	39	0			40	1	20					SPARE
SPARE					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

USING AGENCY DESIGN SUBMISSION APPROVAL FORM

Project Number: _____ Phase _____ Part _____ Date: _____

Project Title: _____

_____

☐ PROGRAMMING ☐ SCHEMATIC ☐ DESIGN DEVELOPMENT

☐ INTERIM CONSTRUCTION DOCUMENTS ☐ CONSTRUCTION DOCUMENTS

The _____ has completed its review of the Submission documents, dated _____, for the above-referenced Project, and hereby accepts and approves the Design of the Project to this Stage, with comments.

APPROVED BY: _____

Using Agency Representative Date

_____

Title

cc: Project Coordinator
Agreement File
Central File

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF GENERAL SERVICES
HARRISBURG

April 18, 2007

Bureau of Occupational & Industrial Safety
UCC Plans Review Division
7th and Forster Street
Harrisburg, PA 17121
Attn: Mr. Ron Seiler

Re: Special Inspections

Dear Mr. Seiler:

Thank you for meeting with Ron Blauch and Dwight Herrmann on April 12th to discuss Special Inspections. We want to reassure you that we shall continue to demand of our Professionals full compliance with the Code, leading up to the final execution of the Special Inspections and Observations Statement indicating compliance with the approved plans and specifications and all applicable provisions of the UCC.

As discussed, we have summarized Special Inspections items appearing in the 2006 edition of the International Building Code for which we would like clarification of acceptable practice. We propose for your approval the following:

Table 1704.3 Item 2.b Inspection of bolt tightening for slip-critical Connections
If Direct Tension Indicator Washers or Twist-Off bolts or other systems providing visual verification of proper tightening are used, continuous inspection of bolt tightening is not required.

Table 1704.3 Item 5.a.1-3 Inspection of groove and fillet welds
If Liquid Penetrant, Magnetic Particle, Ultrasonic Contact, or Radiographic Examination is performed on fifteen (15) percent of critical welds, continuous inspection of the welding process is not required.

Table 1704.4 Item 3 Inspect embedded bolts where allowable loads have been increased per Para 1912.5
Continuous inspection is interpreted to mean inspection of all installed bolts prior to placing concrete.

Table 1704.4 Item 5 Making cylinders, performing slump and air tests and recording temperature of concrete
Qualified Contractor personnel, with oversight by the Special Inspector, may make cylinders; perform slump and air tests and record concrete temperature.

Table 1704.4 Item 6 Inspection of concrete placement
Inspection of every concrete pour is not mandatory, providing the inspector exercises oversight and approves application techniques. Shotcrete placement is to be continuously inspected.

Table 1704l.5.1 Item 4 Inspection of grout and rebar placement in CMU
Continuous inspection of CMU grouting is not required if all grouted cores are marked and twenty (20) percent of the core columns are examined with a rebar locator and ultrasound or drilling to verify grout placement.

Bureau of Engineering & Architecture
Room 203, 18th & Herr Streets, Harrisburg, PA 17125
Phone (717) 787-3709 Fax (717) 772-2036

Table 1704.5 Item 4 Test compaction of controlled fill
The Contractor's independent Quality Control Agent may perform compaction tests under the oversight of the Special Inspector, providing the Special Inspector approves all results and operating procedures and performs random independent check tests.

It is our intent to distribute our final understanding to all parties involved in design or construction of Commonwealth projects who are involved with Special Inspections.

Sincerely,

Gary R. Taylor, P.E.
Director
Bureau of Engineering & Architecture

xc: Tom Rados
Ron Blauch
Dwight Herrmann
Directors File
Central File

Bureau of Engineering & Architecture
Room 203, 18th & Herr Streets, Harrisburg, PA 17125
Phone (717) 787-3709 Fax (717) 772-2036

DEPARTMENT OF LABOR & INDUSTRY
COMMONWEALTH OF PENNSYLVANIA

BUREAU OF OCCUPATIONAL AND INDUSTRIAL SAFETY
HARRISBURG, PA 17120

717-787-3806 Fax: 717-783-5002 www.dli.state.pa.us

May 07, 2007

Gary R. Taylor, P.E.
Director
Bureau of Engineering & Architecture
Room 203
18th & Herr Streets
Harrisburg, Pa. 17125

Re: Special Inspections

Dear Mr. Taylor,

Please be informed that upon a review of the Bureau of Engineering & Architecture's Special Inspection summary, submitted to this Department on April 18, 2007, we find no opposition to your special inspection program as presented.

It is our opinion that your inspection and test program, as summarized, meets both the spirit and the intent of the 2006 International Building Code chapter 17. However, be advised, that thru the adoption of future triennial code editions, we may have to revisit this matter if the testing and inspection requirements were to change.

If I can be of any further assistance please do not hesitate to contact me at 717-787-2525 of email at rseiler@state.pa.us.

Sincerely,

Ronald Seiler BCO
Chief
Buildings Plan Review Division

Cc: Edward Leister
File

INSTRUCTIONS FOR
GEOTECHNICAL SERVICES AND SAMPLE RFP

1. CONTENTS PAGE

INSTRUCTIONS TO PROFESSIONAL

2. SCOPE

A. The Professional shall be responsible for obtaining Geotechnical Services from a Foundation Consultant that will include investigation and analysis of existing subsurface conditions and monitoring of earthwork during construction. Pre-construction efforts shall include:

1) Investigation/analysis/recommendations for design of site work, including embankments, slopes, retaining structures, foundations and all under ground structures, site and subsurface drainage, roads and pavements.
2) Analysis of costs for alternate designs.
3) Analysis of excavation and fill problems.

3. PREPARATION OF TEST BORING PLAN AND SPECIFICATIONS - SCHEMATIC SUBMISSION

A. The Professional, in conjunction with his Civil/Structural Engineer, is to prepare RFP Documents for Geotechnical Services, including the taking of test borings. These are to be submitted with the Schematic submission. If the footprint of the building is in question, the test boring plan shall be submitted immediately after Schematic, 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.

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 surveying corps at the time of staking out the holes. There shall be a Schedule of Contract Quantities summarizing quantities of proposed work, similar to the following:

SCHEDULE OF CONTRACT QUANTITIES

No. Holes	Earth Drilling	Rock Coring	Total Footage
45 Std. Borings	600 Lin. Ft.	275 Lin. Ft.	875 Lin. Ft.
30 Auger Borings	180 Lin. Ft.	--------	180 Lin. Ft.

D. 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.

E. The Professional shall indicate all known surface and subsurface improvements that should be avoided when doing the test borings. Information is to be obtained from Pennsylvania One-Call, existing site drawings, interviews with Using Agency personnel, and site inspection. The test boring drawings shall also require the Contractor to contact Pennsylvania One-Call, and shall list utility company contacts.

F. 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 holes shall be carried to the contract depth regardless of the material encountered." If necessary, the stipulated rock penetration may be increased 10, 15 or 20 feet into rock.

G. In areas of the State where limestone formations are predominant, it shall be stipulated on test boring drawing TB-l, 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.

H. The test borings are made for the primary purpose of obtaining accurate design information. At the same time, the Professional recognizes the need for Contractors to have knowledge of subsurface conditions. Therefore, the Test Boring Logs and Test Boring Drawings are incorporated into the construction contract as a Contract Document.

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 holes shall be carried to greater depth regardless of the material encountered. The number and depth of these holes 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 Plan, 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 bottom 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 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. The depth of water observation holes shall be 15’ below the basement elevation and at least 2’ below the deepest excavation contemplated.

L. The Professional shall edit and adopt the attached specifications for test borings for inclusion in the Foundation Consultant’s RFP.

M. The Professional shall also request prospective proposers to provide unit prices listed below, which will be used to adjust the final payment, for variances between the Schedule of Contract Quantities and the actual work performed.

1) Earth drill (Standard Test Borings), complete, per lineal foot.
2) Rock coring, complete, per lineal foot.

3) Mobilization and demobilization.
4) Auger borings, complete, per lineal foot.
5) Test pits, complete, per test pit.
6) Thirty (30") inch long undisturbed samples, per sample.

4. GEOTECHNICAL SERVICES

A. A Foundation Consultant, with a minimum of five (5) years experience, shall be retained for the purpose of providing all the Geotechnical Services, or Geotechnical Services may be provided by the Professional's in-house staff. Services shall consist of:

1) Stake-out of test borings by a surveyor. The Professional shall contact the E/A Supervisor of the Survey Section at (717-787-6648) and furnish him with three (3) copies of approved test boring plans. Survey Section will advise if they or the Foundation Consultant are to do the stake-out.
2) Conducting Test Borings, subcontracted if necessary.
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) Writing the Geotechnical Report with recommendations.
7) Performing earthwork monitoring during construction.
8) In addition a qualified Registered Pennsylvania Professional Engineer from the Foundation Consultant's firm, familiar with the Project, should be available for any job conferences or consultations during the design and/or construction stages of the Project.

B. Principals shall be Registered Professional Engineers. Final reports shall be prepared and signed and sealed by a Registered Pennsylvania Professional Engineer.

C. The basis for estimating Earthwork Monitoring During Construction shall be established by the Professional, so that all Foundation Consultants will base their proposals on the same requirements. The Professional shall determine the unit prices needed after discussions with the proposers. An example list of Unit Prices follows:

1) Review reports of Contractor's Quality Control Agency — 1 lump sum
2) Provide on-site monitoring. Site visits shall be assumed to be less than 4 hours duration on-site and on-site hours are to include travel hours and travel costs. Personnel are to be equipped with nuclear density devices when required.
   a) By technicians — ___ hours
   b) By Professional Engineers — ___ hours
3) Modified Proctor Tests (ASTM D 1557) — ___ each
4) Clerical time typing reports — ___ hours

D. Where caissons are used, the Consultant's representative shall record pertinent data on each caisson, including his descent into the shaft to verify bearing conditions.

E. The Professional shall submit the RFP for Geotechnical Services to the Department for review and approval prior to soliciting proposals from Foundation Consultants.

F. The quotations shall be submitted on Proposal Forms provided, similar to the Sample Proposal Form herein, where Pre-Construction Geotechnical Services and Earthwork Monitoring During Construction are totaled. The Professional may add a maximum of 10% to the invoices received for subcontracted services. If Geotechnical Services are to be performed directly by a member of

the Professional Team, they shall be quoted as a not-to-exceed amount, in accordance with a detailed breakdown and, if awarded, shall be billed as follows:

1) For all work excluding laboratory testing and subcontracted work, the total cost shall be salary times multiplier, in accordance with the Professional Agreement, plus travel at the current rate per mile, subsistence, and long distance telephone expenses. Invoices must be supported by payroll summaries showing names, classifications, hourly rates, tasks performed, and hours and dates worked.
2) Costs for laboratory testing shall be in accordance with firm's established unit prices for the various necessary tests.
3) Earthwork monitoring during construction shall be at Unit Prices quoted in the proposal.
4) Subcontracted work shall be billed at quoted lump sum amounts, plus a maximum of 10%.

5. PROPOSALS AND AWARD

A. Upon receiving approval of the Test Boring Plan, the Professional shall solicit proposals from as many responsible and experienced Foundation Consultants 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. The Foundation Consultant shall also include its experience brochure as part of its Proposal.

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.

C. Professional shall encourage comment 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 Geotechnical Services, must stipulate a date for receipt of proposals, the minimum number of drilling rigs to be used by the Test Boring Contractor, and a specific date on which all work must be completed.

E. The Professional shall analyze proposal results and make his recommendation for award to the Department. He shall certify that the recommended consultant meets all qualification requirements. The low proposal shall be the low proposal for the total of Pre-Construction Services and Construction Monitoring Services. The Professional need not recommend the low proposer, but should justify his recommendation for a proposer who is not low.

F. The Department will issue a Work Order for Pre-construction Services, and upon receipt the Professional shall authorize subsurface investigation work to proceed. The Work Order will be in two (2) parts. The Work Order for Earthwork Monitoring During Construction will be issued after the Project proceeds to construction, at quoted rates plus escalation, if monitoring occurs more than 18 months after the date of the Geotechnical Report.

6. PERFORMING TEST BORING WORK: DIRECTION, INSPECTION, SOILS ENGINEERING WORK AND CHANGES

A. The test boring work shall be properly directed by the Foundation Consultant 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 to achieve the purpose of field inspection.

B. If the Foundation Consultant considers it necessary to make significant changes in the test boring program he shall request approval from the Professional. The Professional and/or its Civil/Structural Engineer should promptly make its recommendation to the Department, who shall authorize the change. Small changes in the program, such as adjustment of drilling depth, may be authorized by the Foundation Consultant

7. OBSERVING GROUND WATER LEVELS

A. It shall be the responsibility of the Foundation Consultant to observe ground water levels at suitable intervals during the entire design stage and to tabulate and include this information in the Soils Report. The Soils Report should be updated with observations made after completion of test borings.

8. RELEASING TEST BORING INFORMATION

A. The Professional shall furnish, upon the request of prospective Contractors, the Geotechnical Report with all accompanying attachments. Test Boring Drawings and Test Boring Logs included in the Report are 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; it is not to be relied upon for accuracy or completeness. The full Report shall not be delivered to or reviewed by prospective Contractors, unless the standard form of receipt, signed in duplicate by the requesting Contractor, is first obtained by the Professional, as provided in Section 01040 and the Earthwork Section in the Project Manual. The standard form of receipt is an exhibit in Chapter 15.

B. Soil and rock samples may be viewed by Contractors at the premises of the Foundation Consultant.

7. 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 Department may grant an extension of time for this requirement if necessary.

8. THE GEOTECHNICAL REPORT

A. The Geotechnical Report shall be prepared by the Foundation Consultant. 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

sitework, embankments, slopes, retaining structures, foundations, slabs, paving, subsurface drainage and all structures supported by earth.

11) 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 Plan.
2) Test Boring logs.
3) Test Boring Result 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, where applicable.

C. Test Boring Drawing(s) and Test Boring Logs are not warranted for accuracy or completeness, and are not incorporated into the construction contract as a Contract Document. The Contractors may view this information for informational purposes; however, contractors remain fully responsible for existing subsurface conditions between test boring locations and should perform their own investigation.

9. PAYMENT

A. Provided prior approval of E/A has been obtained, the Professional shall invoice for work by Foundation Consultant as follows, plus the Professional's administrative fee:

1) Test Boring work quote amount adjusted for actual quantities of work performed.
2) Geotechnical Engineering and inspection during test boring drilling and preparing the Subsurface Site Investigation Report: Quoted amount as per Proposal.
3) Earthwork Monitoring During Construction: in accordance with Unit Prices quoted.
4) Work performed in-house by Professional shall be billed in accordance with the Professional Agreement

12. INVOICING

A. The Professional shall present all billings to the Public Works Fiscal Unit on its own invoice. Originals and two (2) copies of all invoices and two (2) copies of back-up documents must be submitted.

B. The Professional should coordinate with DGS Construction Inspection staff on procedures for verification of Construction Monitoring hours. Invoices will be routed through them for approval.

C. Three (3) copies of invoices from third parties must accompany this invoice.

D. Invoice for work done directly by Professional must be accompanied by copies of payroll summary on DGS standard form.

E. All invoices must be signed by the Professional.

F. All back-up material must be signed by authorized personnel.

SAMPLE REQUEST FOR PROPOSAL
(Professional Letterhead)

Date _____

To: _____

_____

_____

Re: **REQUEST FOR PROPOSAL FOR GEOTECHNICAL SERVICES**

DGS Project No. _____

Project Title _____

_____

Gentlemen:

Thank you for your interest in submitting a proposal on Geotechnical Services for the above referenced project for the Commonwealth of Pennsylvania and for which we are the design Professional. Enclosed are the following documents:

Test Boring drawing(s) _____
Test Boring specifications
Proposal Form

The Test Boring Proposal ☐ does, ☐ does not include survey/stake-out of boring locations.

You, the Foundation Consultant, are to provide full-time on-site inspection of the test boring operation, 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, write the Geotechnical Report and perform earthwork monitoring during construction.

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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 sitework, embankments, slopes, retaining structures, foundations, slabs, paving, subsurface drainage and all structures supported by earth.
Recommended foundation system with cost analysis if alternate systems are recommended.

There shall be appendices to the Report which shall include:

The Test Boring Plan.
Test Boring logs.
Test Boring Result 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, where applicable.

The Test Boring Drawing(s) and the Test Boring Log Drawings 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 Drawings and Test Boring Logs.

If the Foundation Consultant considers it necessary to make significant changes in the test boring program he shall request approval from the Professional. Small changes in the program such as adjustment of drilling depth shall be authorized by the Foundation Consultant for payment per the contract Unit Price schedule.

The test borings and Geotechnical Report shall be quoted lump sum, subject to changes in scope properly authorized. The construction earthwork monitoring is to be quoted and performed under Unit Prices. The quantities of earthwork monitoring work items on the proposal form shall be used only to provide the basis for determining the low proposal including Construction Monitoring. Construction Monitoring unit prices shall be subject to escalation if not performed within 18 months of the date of the Geotechnical Report. The Work Order for construction monitoring will be issued when the Project proceeds to construction, at rates quoted plus applicable escalation. Construction earthwork monitoring is not to duplicate the Full Service Quality Control Testing required by the Contractor. It is only to provide oversight of the Contractor's Quality Control Agent by reviewing QC test results and making sufficient site visits to confirm that the Contactor and his QC Agent are performing. It also is to provide the required approval of bearing soil, prior to pouring foundations, and if there are deep foundation systems (drilled piers, piles, etc.), to provide full time observance and acceptance of all work.

A qualified Registered Pennsylvania Professional Engineer, familiar with the Project, should be available for job conferences or consultations during the design and construction stages 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.

Very truly yours,

SAMPLE PROPOSAL FORM
GEOTECHNICAL SERVICES

Date _____

To: _____
_____
_____

Proposer: _____
_____
_____

Project: DGS No. _____

Title: _____
_____

We propose to perform the pre-construction Geotechnical Services, including Test Borings and the Geotechnical Report, in accordance with your RFP dated _____ for the amount of :
_____ $_____

Additions or deductions of Test Boring work shall be shall be at the following Unit Prices:

[Professional to edit as required]

Earth drill	$_____	per LF
Rock coring	$_____	per LF
Mobilization and demobilization	$_____	per EA
Auger boring	$_____	per LF
Test Pits	$_____	per EA
Thirty (30”) inch long undisturbed samples	$_____	per EA

Test Boring work shall be completed by _____ and shall be performed with _____ rigs. The Geotechnical Report shall be completed by _____.

We propose to perform earthwork monitoring during construction in accordance with your RFP at Unit Prices in the following schedule:

SCHEDULE OF UNIT PRICES
EARTHWORK MONITORING DURING CONSTRUCTION

(Professional, fill in columns 1-3.)

WORK ITEM DESCRIPTION (1)	QUANTITY (2)	UNIT (3)	UNIT PRICE (4)	EXTENDED TOTALS (5)
			$	$
			$	$
			$	$
			$	$
			$	$
			$	$

Total Earthwork Monitoring $_____

SUMMARY

Pre-Construction Geotechnical Services $_____

Earthwork Monitoring During Construction $_____

GRAND TOTAL FOR PRE-CONSTRUCTION SERVICES AND MONITORING $_____

Where caissons are used, the Consultant shall record pertinent data on each caisson, including descent into the shaft to verify bearing conditions.

Proposer-

_____

_____-_____ , _____

Witness Officer and Title Date

SEAL
IF
CORP

SPECIFICATIONS FOR TEST BORINGS

1. C0NTENTS

2. 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.

3. 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.

4. 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 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.

5. 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 his 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.

6. 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 Department.

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. The number of rigs required to perform the work is _____.

E. Test Boring work, including submission of records and reports, is to be completed by _____.

7. 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. Accidents and Claims. The Contractor shall be responsible for all accidents and shall indemnify and protect the Institution, the Professional, the Consultant and the Department from all suits, claims and actions brought against them, or any of them, for damages, based upon or connected with any injury or alleged injury to person or property of another, including death, resulting from any act or omission or anything which was a part of, connected with, or incidental to the project or the work, labor, services or materials under the Contract. This shall include indemnity and reimbursement for legal and other expenses incurred by the Institution, the Professional and the Department.

G. Contractor's Liability. Under this Contract, the Contractor has the status of an independent Contractor and as such shall properly safeguard against any and all injury or damage to the public, to public and private property, materials and things; and as such the Contractor alone shall be responsible for any and all damage, loss or injury to persons or property that may arise, or be incurred, in or during the conduct or progress of said work without regard to whether or not the Contractor, its subcontractors, agents, or employees have been negligent; and the Contractor shall keep the Institution, the , the Professional and its Consultants free from, and discharged of, any and all responsibility and liability for risks and casualties of every description, for any or all

damage, loss or injury, including death, to persons or property arising out of the nature of the work, from the action of the elements, or from any unforeseen or unusual difficulty. The Contractor shall assume and be liable for all blame and loss of whatsoever nature by reason of neglect or violation of any federal, state, county or local laws, regulations or ordinances.

8. 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.

9. 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.

B. The Contractor shall assign a capable, responsible representative in the field to supervise the Contractor's workers at all times and to carry out the directions of the Consultant and Professional. A working driller may be delegated full responsibility for superintendence on the site.

10. PROTECTION OF PROPERTY

A. The Contractor shall take all necessary precautions to protect existing structures, utilities, walks, drives, or other property from injury due to its work.

B. The grounds shall be constantly cleared of all dirt, debris, etc., resulting from the Contractor's work. At the conclusion of the work, the site shall be left in a neat, clean condition, acceptable to the Professional and the Institution.

C. Contractor's equipment, when not in use, shall be stored where directed by the Institution.

11. RESTORATION OF DAMAGE

A. All walks, drives, utilities, or other property damaged by the Contractor's work shall be restored, at the Contractor's expense, to, as nearly as possible, their original conditions and to the satisfaction of the Institution and the Professional. All drill holes shall be plugged and all test pits shall be back filled and compacted level with the original surface.

12. LINES, LEVELS, MEASUREMENTS, ETC.

A. The location of all test borings and test pits will be staked out by _____. It is the Contractor's responsibility to verify that all borings and pits are made at locations that will not interfere with or harm existing subsurface utilities or utilities located by Pennsylvania One Call.

13. EXISTING SUBSURFACE UTILITIES

A. Before commencing operations, the Contractor shall notify Pennsylvania One Call to locate all third party-owned utility lines. He shall also note the location of utilities shown on the Test Boring Plan. Safe clearance of these utilities must be maintained for all probes, borings and test pits.

B. If the Contractor feels that the location of any test boring is in question of endangering a subsurface utility, it shall drill a four inch diameter auger hole for purposes of investigation. If a utility line is encountered, the hole location shall be changed as directed by the Professional. The Contractor shall bear sole responsibility for any damage to such existing subsurface utilities resulting from failure to so locate utilities prior to starting any test boring.

C. He should also look for evidence of other unknown underground installations. He shall obtain approval from the U/A for drilling locations after they have been staked out.

14. DATUM

A. All grades and elevations shall be referred to the datum shown on the Drawings.

15. COOPERATION WITH PROFESSIONAL

A. The Contractor shall cooperate with the Consultant in providing to the Professional the opportunity to note and obtain knowledge of each and every occurrence in the progress of the work. The Foundation Consultant shall coordinate inspections by the Professional and the Professional shall not delay the work in so doing.

B. The Contractor shall provide sufficient, safe and proper facilities at all times for inspection of the work by the Professional and the Department.

C. The Contractor shall provide to the 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.

16. INSPECTION

A. The work will be conducted under the general direction of the Foundation 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 done except in the presence of the inspector of the Foundation 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.

17. 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 U/A, 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 a 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.

18. 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.

19. 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.

20. 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.

21. 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."

22. 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.

23. 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. D.G.S. 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.

24. 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 Drilling 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 Foundation Consultant, as determined by the Foundation Consultant, shall prepare Test Boring Results Drawings. They shall be the same size as the Test Boring 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 of Tab "D", Sample Test Boring Results Drawing.

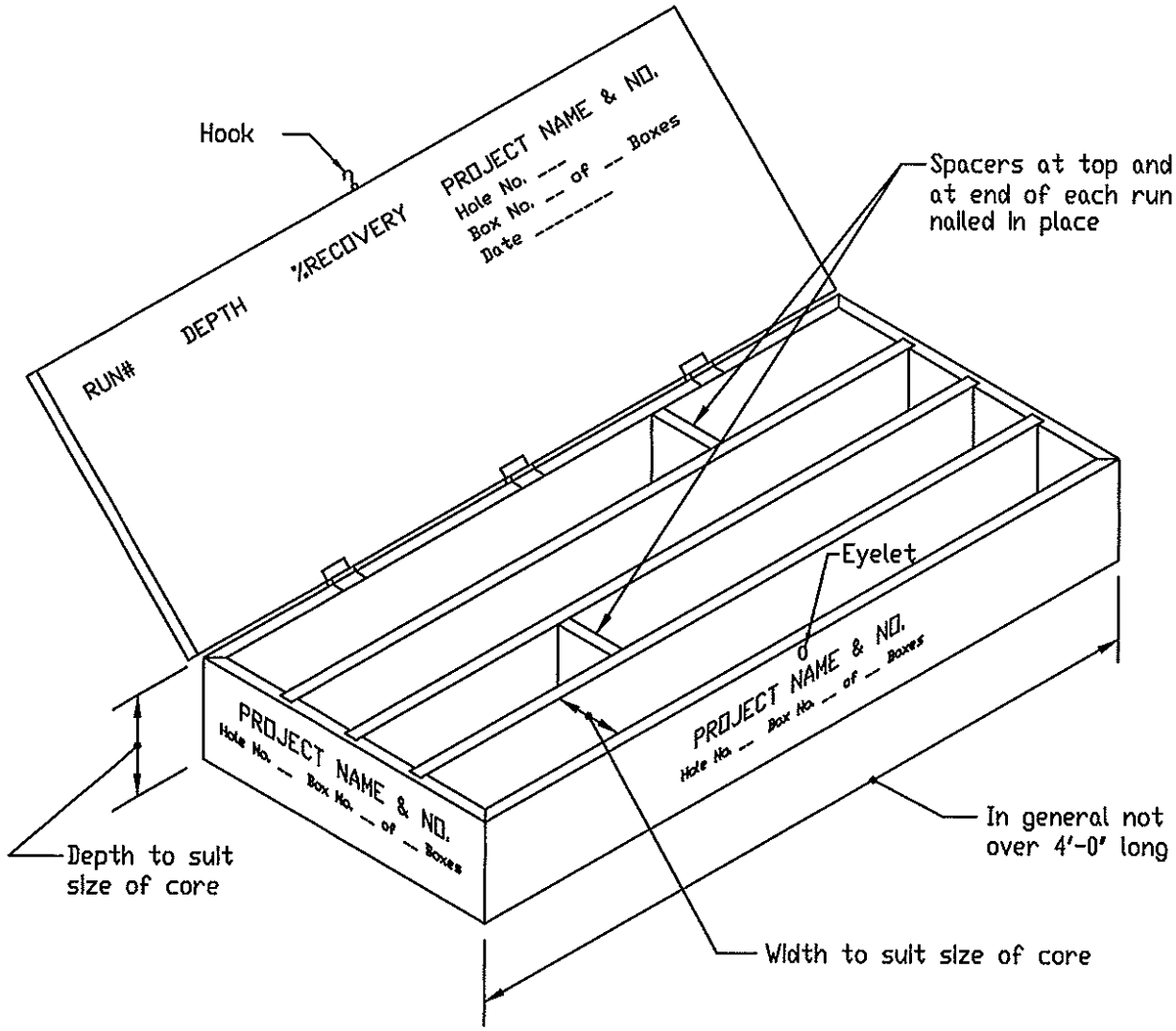
25. DIRECTIVES

A. The Foundation 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 Foundation 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 Foundation Consultant shall not exceed the authority of his agreement from the Professional, who shall be kept apprised of changes. The Professional shall keep E/A apprised of changes.

26. 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.

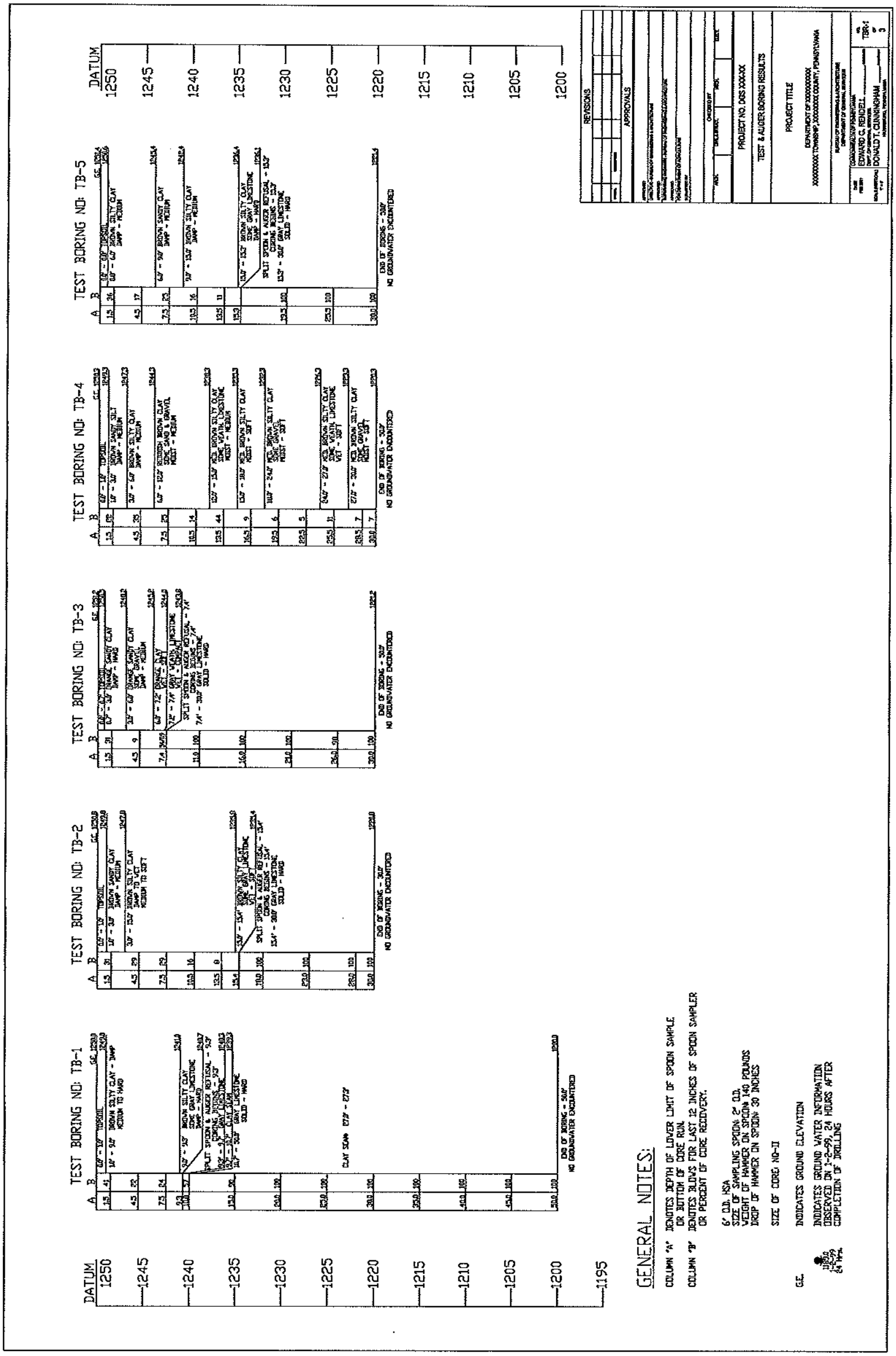


NOTES:

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


TEST BORING NO: TB-1
TEST BORING NO: TB-2
TEST BORING NO: TB-3
TEST BORING NO: TB-4
TEST BORING NO: TB-5
DATUM
1250
1245
1240
1235
1230
1225
1220
1215
1210
1205
1200
1195
GENERAL NOTES:
COLUMN "A" DENOTES DEPTH OF LOWER LIMIT OF SPOON SAMPLE OR BOTTOM OF CORE RUN.
COLUMN "B" DENOTES BLOWS FOR LAST 12 INCHES OF SPOON SAMPLER OR PERCENT OF CORE RECOVERY.
SIZE OF CORE: NQ-II
INDICATES GROUND ELEVATION
REVISIONS
APPROVALS
TEST & AUGER BORING RESULTS
PROJECT TITLE

INSTRUCTIONS FOR
QUALITY ASSURANCE TESTING AND INSPECTION SERVICES AND SAMPLE RFP

1. CONTENTS PAGE

INSTRUCTIONS TO PROFESSIONAL

2. QUALITY ASSURANCE SCOPE

A. The Professional is to specify all testing and Special Inspections as required by the IBC. Primary testing is done by the Contractor's Quality control Agent, and check testing is to be done by Quality Assurance Agent. Special inspections are to be done strictly in accordance with IBC requirements. Refer to Chapter 13 for scope. All tests and inspection hours are listed in a table in the RFP. The extent of these tests shall be approved by DGS in order to achieve some uniformity of testing and inspection requirements for all Projects. DGS has been granted Special Inspections exceptions in a ruling from L&I. See Exhibit in Chapter 15.

3. 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 UCC, including requirements in Chapter 17-Structural Tests and Special Inspections of the International Building Code.

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 our sample RFP. Each test method must be identified by ASTM number and title, or other similar designation as applicable.

4. DESIGN

A. DGS terminology in Section 01401 (and Section 01400) of the 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, he shall so state in the technical specification and refer to section 01401 for the specific tests to be performed. The Professional shall list tests to be taken in paragraph 3.04 of Section 01401. 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 here.

C. The Construction Documents Submission for each project shall reflect the Professional's and his consultants' considered recommendations on Quality Assurance and Quality Control Services in the contract documents.

D. At the Construction Documents Submission the Professional shall submit 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. The RFP is to include the detailed descriptions of inspections listed in IBC Chapter 17 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. Two copies of the RFP shall be submitted to DGS for approval. The RFP shall include the Invitation, Cover Sheet, and Specification for Quality Assurance Testing and Inspection and Proposal. One (1) copy will be returned to the Professional with comments for correction and use in bidding.

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.

5. BIDDING

A. The Professional must send out the RFP at the time the Project is placed for 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 bids from at least three (3) full-service testing laboratories for Quality Assurance Services and shall submit the same to E/A, with his 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 E/A 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."

6. THE CONTRACT

A. Upon receipt of the results of the Professional's Quality Assurance Services solicitations and his recommendations, E/A shall initiate a Work Order to the Professional for the Quality Assurance services. Contact the low (.1) Contract 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 DGS Construction.

C. The Professional shall provide a copy of the Quality Assurance Agency contract to E/A and the appropriate Bureau of Construction regional office.

7. SUBMISSION OF REPORTS

A. The Quality Assurance Agency shall submit four (4) copies of each test report to the Professional and one (1) copy directly to the Bureau of Construction Inspector Supervisor. If the report is field

generated the Supervisor's report is to be delivered to the field office. The Professional shall expeditiously review and make the following distribution immediately after the receipt of the laboratory reports.

1 copy – The Professional
1 copy – Director, Bureau of Construction
1 copy – Job Site
1 copy – The Contractor

B. Any tests that indicate that material does not meet contract requirements shall be immediately brought to the attention of the Inspector Supervisor the Regional Director or their designees by telephone and confirmed later in writing. The Inspector Supervisor 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.

8. 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 and an explanation of 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.

9. ADMINISTRATION

A. During construction the Professional and DGS Construction shall jointly decide what tests and inspections shall occur. Day to day management of the Quality Assurance Agent's activities shall be the responsibility of DGS Construction.

B. The Quality Assurance Agency is not to be delegated the authority to determine when tests or inspections are to occur.

10. QUALITY ASSURANCE AGENCY PERFORMANCE

A. If the Professional finds the Quality Assurance Agency to be deficient in any respect the Professional shall notify the Director of Engineering and Architecture, in writing, with copy to the Director of Construction.

11. BILLINGS

A. The Professional is entitled to a coordination fee of not more than 10% of the cost of tests/inspections.

SAMPLE REQUEST FOR PROPOSAL
(Professional Letterhead)

Date _____

To: _____

_____

_____

Re: **REQUEST FOR PROPOSAL FOR QUALITY ASSURANCE SERVICES**

DGS Project No. _____

Project Title _____

Project Location _____

Gentlemen:

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 design Professional. Enclosed are the following documents:

Specifications for Quality Assurance Testing
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 _____.

Thank you.

Very truly yours,

SPECIFICATIONS FOR QUALITY ASSURANCE TESTING AND INSPECTION

1. C0NTENTS

2. GENERAL

A. The Quality Assurance Agency shall perform services as ordered by the Professional or his agent or DGS Construction. 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 Pennsylvania Department of General Services (DGS).

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.

3. DISTRIBUTION

A. The Quality Assurance Agency shall submit four (4) copies of each test report to the Professional and one (1) copy directly to the Inspector Supervisor. Any tests that indicate that material does not meet contract requirements shall immediately be brought to the attention of the DGS Inspector and the Regional Director by telephone and confirmed in writing. The Quality Assurance Agency shall cooperate fully with the Professional and the DGS in correcting all such conditions.

4. 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.

5. BILLINGS

A. The Quality Assurance Agency shall direct the monthly billing to the Professional for approval and payment by the Professional. The Quality Assurance Agency shall comply with requirements of the Bureau of Construction for documentation for their verification of the accuracy of the charges. Construction will forward the bill to the Bureau of Engineering and Architecture for payment. Charges that might be backcharged to the Contractor shall be identified.

6. CHANGES/QUANTITIES

A. The List of Tests 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 DGS Construction Inspector. Quantities of tests or inspection hours may be adjusted as appropriate, 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.

7. INSURANCE

A. The Quality Assurance Agency shall maintain Worker's Compensation Insurance and such other insurance as will protect it, the Professional and the Owner 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.

8. JOB CONFERENCES

A. A representative of the Quality Assurance Agency shall attend the first Job Conference at no additional cost. Subsequent attendances shall be reimbursable at the Inspection Hourly Rate quoted.

9. CONCRETE TEST CYLINDERS

A. Primary concrete strength tests are to be performed by the Contractor's Quality Control Agent. Perform check tests as requested.

10. PROJECT SPECIFICATIONS

A. The Quality Assurance Agency shall comply with applicable requirements of Specifications for work tested and 01401-QUALITY ASSURANCE TESTING. Tests listed in SECTION 01401 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.

11. 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. 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

QUALITY ASSURANCE TESTING AND INSPECTION SERVICES

[on Professional's Letterhead]

Date _____

To: _____

_____

_____

Proposer: _____

_____

_____

Project: DGS No. _____

Title: _____

Location: _____

We propose to perform the testing or inspections listed in the following schedule for the prices as listed below. All tests will be performed by the personnel of the Quality Assurance Agency except for the following:

_____

_____

_____

REQUIRED BY[3]	DESCRIPTION OF TEST OR INSPECTION	C, P, I, OR A[4]	REFERENCED STANDARD	IBC REFER-ENCE[5]	NO. OF TESTS /HOURS	UNIT PRICE[1]	TOTAL
	BITUMINOUS PAVING						
DGS check test	Field inspection of construction procedures				Hrs		$
DGS check test	Bulk Specific Gravity…of Compacted Bituminous Mixtures…		ASTM D1188 or D 2726		Ea		$
DGS check test	Density of Bituminous Concrete in Place by Nuclear Method		ASTM D 2950		Hrs		$
DGS check test	Thickness or Height of Compacted Bituminous Paving Mixture Specimens		ASTM D 3549		Ea		$
	CONCRETE						
IBC Ch. 17 Special Inspec	1. Inspection of reinforcing steel, including prestressing tendons, and placement	P	ACI 318: 3.5, 7.1-7.7	1913.4	Hrs		$
IBC Ch. 17 Special Inspec	2. Inspection of reinforcing steel welding, in accordance with Table 1704.3, Item 5B		AWS D1.4; ACI 318: 3.5.2		-	-	-
IBC Ch. 17 Special Inspec	3. Inspect bolts to be installed in concrete prior to and during placement of concrete, where allowable loads have been increased	A		1911.5	Hrs		$
IBC Ch. 17 Special Inspec	4. Verifying use of required design mix	P	ACI 318: Ch. 4, 5.2-5.4	1904.22, 1913.2, 1913.3	Hrs		$
DGS check test	5. 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	ASTM C172, C31; ACI 318: 5.6, 5.8		Hrs		$
IBC Ch. 17 Special Inspec	6. Inspection of concrete and shotcrete placement for proper application techniques	C	ACI 318: 5.9, 5.10	1913.6, 1913.7, 1913.8	Hrs		$
IBC Ch. 17 Special Inspec	7. Inspection for maintenance of specified curing temperature and techniques	P	ACI 318; 5.11-5.13	1913.9	Hrs		$
IBC Ch. 17 Special Inspec	8. 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: 18.18.4		Hrs		$

REQUIRED BY[3]	DESCRIPTION OF TEST OR INSPECTION	C, P, I, OR A[4]	REFERENCED STANDARD	IBC REFER-ENCE[5]	NO. OF TESTS /HOURS	UNIT PRICE[1]	TOTAL
IBC Ch. 17 Special Inspec	9. Erection of precast concrete members	P	ACI 318: Ch.16		Hrs		$
IBC Ch. 17 Special Inspec	10. 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 Ch. 17 Special Inspec	11. Inspect formwork for shape, location and dimensions of the concrete member being formed.	P	ACI 318: 6.1.1		Hrs		$
DGS requirement	Review Contractors' design mixes, Certificates of Compliance and material test reports				1 LS		$
DGS check test	Compressive Strength of Cylindrical Concrete Specimens[2]		ASTM C39		Ea		$
	CAST STONE						
DGS check test	Absorption of Architectural Cast Stone		ASTM C1195		Ea		$
	MASONRY						
DGS check test	Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry, Annex A7 Compressive Strength[2]		ASTM C780		Ea		$
DGS check test	Method of Sampling and Testing Grout[2]		ASTM C1019		Ea		$
IBC Ch. 17 Special Inspec	**Level 1 Special Inspection**		ACI 530/ASCE 5/TMS 402, ACI 530.1/ASCE 6/TMS 602				
IBC Ch. 17 Special Inspec	1. 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		$

REQUIRED BY[3]	DESCRIPTION OF TEST OR INSPECTION	C, P, I, OR A[4]	REFERENCED STANDARD	IBC REFER-ENCE[5]	NO. OF TESTS /HOURS	UNIT PRICE[1]	TOTAL
IBC Ch. 17 Special Inspec	2. 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 d. Welding of reinforcing bars e. 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 I P P	 Art 3.3G[7] Sec 1.2.2(e), 2.1.4, 3.1.6[6] Sec 1.13[6], Art 2.4, 3.4[7] Sec 2.1.10.7.2, 3.2.3.4(b) [6] Art 1.8C, 1.8D[7] Art 3.6B[7]	 Sec 2104.3, 2104.4	Hrs		$
IBC Ch. 17 Special Inspec	3. 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 Ch. 17 Special Inspec	4. Grout placement shall be verified to ensure compliance with code and construction document provisions a. Grouting of prestressing bonded tendons	I C	Art 3.5[7] Art 3.6C[7]		Hrs		$
IBC Ch. 17 Special Inspec	5. 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		$
IBC Ch. 17 Special Inspec	6. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified	P	Art 1.5[7]				
IBC Ch. 17 Special Inspec	**Level 2 Special Inspection**		ACI 530/ASCE 5/TMS 402[6], ACI 530.1/ASCE 6/TMS 602[7]				

REQUIRED BY[3]	DESCRIPTION OF TEST OR INSPECTION	C, P, I, OR A[4]	REFERENCED STANDARD	IBC REFER-ENCE[5]	NO. OF TESTS /HOURS	UNIT PRICE[1]	TOTAL
IBC Ch. 17 Special Inspec	1. From the beginning of masonry construction, 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	 P P P C C C	 Art 2.6A[7] Art 3.3B[7] Sec 1.13[6], Art 3.4, 3.6A[7] Art 3.2D[7] Art 3.5[7] Art 3.6C[7]		Hrs		$
IBC Ch. 17 Special Inspec	2. 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 d. Welding of reinforcement e. 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 C P C P C	 Art 3.3G[7] Sec 1.2.2(e), 2.1.4.3.1.6[6] Sec 1.13[6], Art 2.4, 3.4[7] Sec 2.1.10.7.2, 3.3.3.4(b)[6] Art 1.8C, 1.8D[7] Art 3.6B[7]	 Sec 2104.3, 2104.4 	Hrs		$
IBC Ch. 17 Special Inspec	3. 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		$
IBC Ch. 17 Special Inspec	4. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified	P	Art 1.5[7]		Hrs		$
	STEEL CONSTRUCTION						
IBC Ch. 17 Special Inspec	1. Material verification of high-strength bolts, nuts, and washers: a. Identification markings to conform to ASTM standards spec in the appr CDs. b. Manufacturer's Certif of Compliance required	P	Applicable ASTM mat'l specs; AISC 335 A3.4; LRFD A3.3		Hrs		$

REQUIRED BY[3]	DESCRIPTION OF TEST OR INSPECTION	C, P, I, OR A[4]	REFERENCED STANDARD	IBC REFER-ENCE[5]	NO. OF TESTS /HOURS	UNIT PRICE[1]	TOTAL
IBC Ch. 17 Special Inspec. (Oversee Contractor's Testing Only.)	2. Inspection of high-strength bolting: a. Bearing-type connections b. Slip-critical connections	P C/P	AISC 360, Section M2.5	1704.3.3	Hrs		$
IBC Ch. 17 Special Inspec	3. Material verification of structural steel: a. Identification markings to conform to ASTM standards specified in the approved construction documents b. Manufacturers' certified mill test reports required		ASTM A6 or A568 ASTM A6 or A568	1708.4 1708.4	Hrs		$
IBC Ch. 17 Special Inspec	4. Material verification of weld filler materials: a. Identification markings to conform to AWS specification in the appr CDs b. Manufacturer's Certif of Compliance required		AISC 360, Sec A3.5		Hrs		$
IBC Ch. 17 Special Inspec	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) Single-pass fillet welds < 5/16" 5) 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	C C C P P P C C P	AWS D1.1 AWS D1.3 AWS D1.4 ACI 318: 3.5.2	1704.3.1 1704.3.1 1903.5.2 1903.5.2 1903.5.2	Hrs		$

REQUIRED BY[3]	DESCRIPTION OF TEST OR INSPECTION	C, P, I, OR A[4]	REFERENCED STANDARD	IBC REFER-ENCE[5]	NO. OF TESTS /HOURS	UNIT PRICE[1]	TOTAL
IBC Ch. 17 Special Inspec	6. Inspection of steel frame joint details for compliance with appr 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 check test	Liquid Penetrant Examination		ASTM E165		Ea		$
DGS check test	Guide for Magnetic Particle Examination		ASTM E709		Ea		$
DGS check test	Practice for Ultrasonic Contact Examination of Weldments		ASTM E164		Ea		$
DGS check test	Guide for Radiographic Examination		ASTM E94		Ea		$
	WOOD						
IBC Ch. 17 Special Inspec	Professional to determine requirements.						
	SPRAYED FIRE-RESISTANT MATERIALS						
IBC Ch. 17 Special Inspec	Professional to determine requirements.						
	EXTERIOR INSULATION AND FINISH SYSTEMS						
IBC Ch. 17 Special Inspec	Professional to determine requirements.						
	SEISMIC RESISTANCE						
IBC Ch. 17 Special Inspec	Professional to determine requirements.						
	WIND REQUIREMENTS						
IBC Ch. 17 Special Inspec	Professional to determine requirements.						

Footnotes-

1. All unit and hourly rates include travel time, travel expense, generation of hand-written field reports and equipment costs for the tests. The Department will pay for a minimum of four (4) hours per day. The method of keeping records for hours on the site shall be approved by DGS. Unit prices for laboratory tests include field sampling U.O.N. Pick-up and transportation of samples for testing is not included U.O.N. Professional Engineer-in-Charge time supervising technicians is included in the rates.
2. Concrete, mortar or grout molds are to be made by QA Agent under Special Inspection hours. "Specimen" is interpreted to mean "Single Cylinder".
3. "DGS check tests" are tests where the primary testing responsibility is Quality Control Testing by the Contractor, or no testing was specified.
4. "C" indicates continuous inspection. "P" indicates periodic inspection. "I" indicates inpect per ruling by L&I (Professional must clarify). "A" indicates inspect all items per L&I ruling. See Exhibit F10 for ruling.
5. IBC 2003.
6. Refers to reference ACI 530/ASCE 5/TMS 402
7. Refers to reference ACI 530.1/ASCE 6/TMS 602

TOTAL PRICE $ _____

_____ _____ (SEAL)

Witness Bidder

INSTRUCTIONS FOR
LAND (BOUNDARY AND/OR TOPOGRAPHIC) SURVEY AND SAMPLE RFP

Project Number: _____ Phase: _____ Part: _____ Proposal Due Date: _____

Project Title: _____

Institution / Location: _____

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 or 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 No. _____

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.
      - Identify survey north on the plans.
      - 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.
- The benchmarks used to establish ties to the datum shall be shown and described on the plan.
- 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:
- Extent of existing roads, berms, walks, streets, and alleys shall be shown.
- Pavement surface materials shall be described.
- Curb-to-curb dimensions and dedicated cartway widths of public roads shall be noted.

c. Surface Features:
- Location and width of all existing streets, right-of-way, parking areas, and easements.
- Retaining walls, steps, sidewalks, etc. shall be surveyed.

d. Structures:
- 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 dimension.
- 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:
- If applicable, drains, swales, spillways and drainage ditches shall be shown and described.

f. Utilities:
- Information for all on-site utilities, above and underground, shall be supplied in accordance with Act 38 of 1974, Commonwealth of Pennsylvania.
- The surveyor shall comply with Act 187 provisions, as amended.
- Survey shall note an applicable Pennsylvania One-Call System Serial Number and Utility Listing.
- 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.

- Show and describe location, sizes, direction of flow, gradients, surface and invert elevations of all existing sanitary sewer on or contiguous to the site.
- Show and describe location, type and size of all water, gas, steam and/or oil lines or mains, manholes, valves and/or meter bodes, hydrants, etc.
- Show and describe location electric and telephone lines, transformer stations, cable, fiber optic lines, etc.
- Show all utility poles and label pole numbers
- 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:
- The limit of wooded areas of trees in small groups, including brush and shrub growth, shall be shown in its relative location.
- All single trees with a trunk diameter at waist height over six inches shall be shown, naming the type of tree and approximate trunk diameter.

h. Core Boring and Mines:
- The location of any core borings, test holes and/or utility test pits in the survey area shall be shown.

i. Elevations:
- Elevations shall be shown at all breaks in grade, whether vertical (walls or sloping (terraces).
- 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.
- All spot elevations shall be shown on the plan to the nearest tenth of a foot. Permissible tolerance shall be 1/10 of a foot for spot elevations and ¼ of contour interval for contours and ¼" (0.2') for floor elevations of building.
- 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 Architect to change the interval.
- 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 map that incorporates all physical data secured during this survey. 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 two reproducible mylars of the completed survey, maximum 30" x 42" size.

c. Surveyor shall provide a CAD file of the completed survey in an AutoCAD 2000 (or more recent) compatible format, as approved by the Engineer.

- The CAD file shall include the DTM (Digital Terrain Model) used to create the site contours.
- The CAD file shall include a legend of plan symbols used by the surveyor.
- The Surveyor shall furnish a list of layer names and layer characteristics used to create all objects in the CAD file.
- The Surveyor shall provide a list of any descriptors codes assigned to AutoCAD points.
- Each topographic contour in the CAD drawing shall be assigned to its proper elevation.

d. Surveyor shall provide an electronic, comma delimited, coordinate text file of all points in the following format: point number, northing, easting, elevation, and descriptor.

e. CAD files coordinate text files and any other exchange of digital data shall be provided on a CD (compact disk) format unless otherwise noted.

f. Certification, with seal and original ink signature, by a registered professional land surveyor, to the effect that the survey and map are correct.

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.

BUREAU OF ENGINEERING AND ARCHITECTURE

PROPOSAL FORM FOR LAND/PROPERTY/TOPGRAPHIC SURVEYS

PROPERTY/TOPOGRAPHIC SURVEY COSTS

Date _____

Project No. DGS _____

Professional _____

_____

_____

Date of Bid Invitation _____

Maximum Number of Days Allowed
for Completion of Survey Work _____

1. SURVEYOR

Individual or Firm Name _____

Principal (Name) _____

Pennsylvania Registration No. _____ Date _____

Business Address _____

_____ Zip Code _____

Business Telephone No. _____

Location of Site: _____

_____

_____

_____

Description of Site: _____

_____

_____

_____

Approximate Area 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 $150.00 per hour.

2. Refer to the Professional Agreement, Paragraph 15.

h. Principal:

_____ Hours @ _____ Per Hour = _____

i. Draftsperson/CAD Operator:

_____ Hours @ _____ Per Hour = _____

j. Surveyor:

_____ Hours @ _____ Per Hour = _____

k. Surveyor Assistant:

_____ Hours @ _____ Per Hour = _____

List Other Personnel Categories:

Photogrammetry:
(If applicable, give description and breakdown)

Plus Breakdown of Reimbursables:

TOTAL COST ESTIMATE _____

PAYROLL SUMMARY
FOR
ADDITIONAL SERVICES

Project No. DGS _____

Period Service was Rendered:

From _____ to _____

Firm: Name and Address

_____

_____

_____

DATE OF SERVICE	NAME OF EMPLOYEE AND CLASSIFICATION	NO. OF HRS.	RATE	RATE x 3.0	AMOUNT	ADDITIONAL SERVICES RENDERED – BRIEF DESCRIPTION

Other Expenses: _____

_____

I hereby certify that this is a true and correct record.

By: _____

Title: _____

Department of General Services
Bureau of Engineering and Architecture

PROTOCOL REGARDING
ASBESTOS, LEAD, PCB'S/MERCURY, RADON AND OTHER HAZARDOUS MATERIALS

*Sections D through H are available upon request; contact the DGS Project Coordinator.

A. PROFESSIONAL'S RESPONSIBILITIES TO THE DEPARTMENT

Most major building renovations or additions will encounter some kind of hazardous material (Asbestos, Lead, PCB, Radon, etc.) during the Project, as such, 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. A Hazardous Materials Survey (Part One) and Quality Assurance Hazmat Monitoring (Part Two) are considered Additional Services, as described herein. The Additional Services protocol is described below:

1) As the Professional on this Project, you must establish the qualifications for, and solicit proposals from qualified consultants in their fields, assuming that your own staff will not be providing these services. The Part One 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 you and your Consultant.

2) Once the Professional has received the proposals back from three at least (3) solicited firms, it is responsible to select the firm which can best provide the services at the lowest cost to the Department. You must document and justify to the Department the reason for your selection, if the lowest price is not chosen. The documents submitted to the Department must include the original solicitation and all proposals received. A not-to-exceed Work Order for either Part One or Part Two will then be processed. 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 (see applicable Sections D through G for guidance)
Based on the results of Hazardous Materials Survey and Report, the Professional shall engage a Certified PA L&I Asbestos Designer on your staff (or a Consultant) 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 steps and topics to be followed for asbestos abatement and/or remediation of other hazardous materials. The Professional shall 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 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) Part One: 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 Using Agency, if not available from the Using Agency, contact the Project Coordinator. The hazardous materials 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 hazardous materials survey shall include identification of asbestos, lead based paint, PCB's, and radon, as applicable. The survey report shall include all test results, both positive and negative. Ensure that suspect ACM roofing is 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 Section B.

5) Part Two: 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.

QA 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, not to exceed the estimated number of days established by the Professional in the RFP.

Refer to the E/A Project Procedure Manual and Professional Agreement/General Conditions for guidance on Additional Services procedures. If you have any questions, please contact the Project Coordinator.

B. SAMPLE HAZARDOUS MATERIALS SURVEY RFP LETTER

The following is a sample of an RFP letter for a Hazardous Materials Survey. Edit the sample to suit the Project Scope.

Re: *DGS Project Name*
DGS Project #
Address, etc.
Subject: *Haz Mat Survey Proposal Request*

Dear *Consulting Firm:*

We are requesting a not-to-exceed Proposal (including unit prices, labor & material breakdown) to survey for hazardous materials (asbestos, lead based paint, PCB Ballasts, mercury, radon, etc.) 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, 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:
[Professional to 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 Commonwealth-owned buildings 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 be 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, and recommend specific abatement procedures or controls for each material type per work area. A cost estimate for abatement of all hazardous materials must be included in the Executive Summary.

Personnel performing asbestos surveys shall be accredited by PA L&I. The hazardous materials survey shall include identification of asbestos, lead based paint, PCB's, and radon, as applicable. The survey report shall include all test results, both positive and negative. Ensure that suspect ACM roofing is 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.

Should you wish to visit the building prior to submitting your proposal, please contact me and I will make arrangements. Proposals should be addressed to my attention and must be received in our office no later than _____.

BREAKDOWN FOR HAZARDOUS MATERIALS SURVEY

[Professional shall 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. For radon, no survey may be required depending on use of space(s) and Using Agency input.]

A. ASBESTOS: Survey @ _____ hours x $_____ / hour = $_____

PLM Tests @ _____ samples x $_____ / sample $_____

$_____
subtotal

Unit Costs - PLM Point Counting $_____ per sample
TEM Tests $ _____ per sample

B. LEAD PAINT: Survey @ _____ hours x $_____ / hour = $_____
subtotal

Unit costs - XRF rental $ _____ (lump sum cost for survey)
Paint Chip $ _____ per sample

C. 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 x $_____ / hour = $_____
subtotal

Unit costs - PCB _____ $ per sample

D. RADON: Provide a lump sum cost inclusive of time and material ensuring a sufficient number of samples are collected for the building square footage.

$_____
subtotal

For information purposes, indicate # of samples _____ and type _____

E. MISC. HAZMAT ITEMS: This a lump sum cost for survey identification of items (sample collection if appropriate) that include, but are 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 x $_____ / hour = $_____
subtotal

Unit costs - TCLP $ _____ per sample
Drum/Container fluid/sludge characterization $ _____ per sample
Other: $ _____ per sample

F. COST FOR ANALYSES: Sum of all estimated analysis unit costs needed to accomplish Hazmat survey $_____
subtotal

G. FINAL REPORT (lump sum for 5 copies): $_____
subtotal

TOTAL NOT-TO–EXCEED PRICE (Subtotals A+B+C+D+E+F+G) $_____

Note: Invoices to Professional shall reflect actual costs incurred, based on Unit Costs above, and may not exceed the NTE price.

C. SAMPLE QUALITY ASSURANCE HAZMAT MONITORING RFP LETTER

The following is a sample of a proposal letter for Quality Assurance Hazmat Monitoring. Edit the sample to suit the Project Scope.

Re: *DGS Project #*
Address, etc.
Subject: *Quality Assurance Project Monitoring Proposal Request*

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, or asbestos and lead paint]* activity portions of the above-referenced Project. Invoices shall reflect actual costs incurred. The Quality Assurance Hazmat Monitoring firm shall be on site 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 Action Plan. The Quality Assurance Hazmat Monitoring firm shall monitor specification requirements, and attend meetings when required for *[asbestos, or asbestos and lead paint]* work activities are being performed by the Contractor.

The duration of the *[asbestos,* or *asbestos and lead paint]* related work is estimated to be _____ shifts. (Some days may be just asbestos activities, others just lead activities, and some combined.)

The scope of work for asbestos abatement and lead activities monitoring shall include the requirements as set forth below. In addition, the Quality Assurance Hazmat Monitoring firm must be certified to perform asbestos work in the city of Philadelphia per requirements of Air Management Services, when applicable.

[The Professional shall amend the following section, if for materials other than asbestos and lead; however, this section provides the level of detail the Department expects.]

QUALITY ASSURANCE HAZMAT MONITORING (Asbestos and/or Lead Activities)

1. NATURE AND SCOPE OF THE WORK

   A. This contract for quality assurance work by the Quality Assurance Hazmat Monitoring firm, hereafter referred to as the 'QA', shall include all inspection, equipment, sample collection, transportation, required meetings and analysis of samples. The QA must ensure the following tasks are completed as part of its work: complete removal and decontamination of all asbestos and/or lead containing 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 asbestos/lead dust or debris released by any phase of the work; workman must wear appropriate respiratory protection in work area(s) until cleared for re-occupancy.

   B. The QA 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 shall be such that turn around 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.

C. At the completion of this project the QA shall certify using the appropriate Certification Of Visual Inspection form(s) found at end of specification section(s), that all asbestos and/or lead containing materials have been completely and satisfactorily removed, decontaminated, and disposed of in accordance with project specifications and all applicable codes, laws and regulations.

D. 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.

E. The QA is retained for the benefit of the Department only. The work of the QA will not relieve any of the responsibilities of the Asbestos Abatement Contractor including supervision, inspection, testing and quality control work.

F. The Asbestos Abatement Contractor will provide access to work areas and furnish such incidental labor and assistance as is deemed necessary by QA's personnel.

G. Personnel representing the QA will not act as foreman or perform other duties for the Asbestos Abatement Contractor.

H. The QA is not authorized to revoke, alter, relax, enlarge or release any requirements of the Asbestos Abatement Specifications. The QA shall report and make recommendations to the Department through the Professional and attend required meetings.

I. The QA 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.

2. TASKS SPECIFICATION

A. Field Inspection, Air Sampling and Monitoring

1) The QA shall furnish a full time field Quality Assurance Inspector for the Abatement Project who meet the following minimum requirements: Asbestos - a minimum six months related experience and successful completion of a NIOSH #582 course "Sampling and Evaluating Airborne Dust" or equivalent, or one year related experience; Lead - a minimum of six months of lead project monitoring experience and completion of a 24 hour EPA Lead Based Paint Inspector certification is required to perform lead project monitoring on 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 must provide a microscope on site for asbestos PCM clearance analysis, if requested, for immediate turn-around.

2) 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.

3) Steps must be taken to preserve evidence related to the asbestos and its removal. Any documents related to the removal of the asbestos or to the original installation must be preserved. Visual identification of the asbestos should be made prior to its removal (including the manufacturer's name, if available). Any stickers on suspected asbestos containing materials, or any boxes which are suspected to contain asbestos materials, must be preserved. Removal costs must be documented. A portion of each type of asbestos containing materials must be preserved. The portion must be large enough to do three (3) constituent analyses. The chain of custody for asbestos must be preserved with the sample.

4) The QA shall, by visual and physical means, assure satisfactory removal of asbestos and/or lead containing material and the satisfactory disposal of same.

5) The QA shall collect necessary bulk, wipe, air, and soil samples as outlined in this document, 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. All necessary sampling and other related equipment shall be furnished by the QA.

6) Air sampling and/or wipe sampling of the work areas and surrounding environment shall be conducted by the QA 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.

7) Prior to the pre-clearance air monitoring for asbestos and wipe sampling for lead, the QA shall be responsible to perform a visual inspection of the work area(s) to ensure complete removal of asbestos and/or lead containing materials per scope of 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. The QA shall utilize the appropriate Certification of Visual Inspection Form.

8) Baseline sampling shall be performed by the QA in each work area for asbestos and/or lead prior to commencement of the work for each work area location. For asbestos, the pre-clearance monitoring (PCM) shall be lower than the background readings established by pre-job monitoring, or 0.01 f/cc, whichever is higher. For lead, baseline wipe samples shall be collected outside of the proposed work area for hard surfaces, collect baseline soil samples for work performed outside the building but inside of the proposed work area, and collect lead air samples outside proposed work area in buildings that will be occupied during the Project. This baseline schedule outlines minimum requirements.

9) When the pre-clearance criteria is met, perform final clearance testing by Transmission Electron Microscopy (TEM), with a clearance criteria of 70 s/mm^2 for fibers greater than (.5) microns in length with an aspect ratio of 5: 1 (AHERA). One (1) TEM shall be collected and analyzed per abatement area.

10) 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)[4]	Upon work (pre-clearance) completion	2 (minimum)	1500	2-10
Work Area (TEM)[4]	At completion (final)	1[3]	1200	2-10

Schedule Notes:

1. Consecutive daily air samples will be collected for the duration of the work shift for each active work area.
2. 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.
3. One sample collected and analyzed per work area; archive remaining filter for one year.
4. Aggressive air sampling must be conducted when work area is prepared as a negative pressure enclosure.

11) For lead work, air and wipe samples shall be collected in accordance with, but not necessarily limited to, the following schedule or as directed by the Department:

Air samples will be required daily outside of the work area in occupied buildings only. Wipe samples will be required outside of the work area inside of the building only when visible dust is encountered. Generally, any time during the course of the work outside of the work area (inside building), airborne lead or wipe concentrations exceed either the background concentrations or, 30 micrograms per meter cubed for air, the area shall be deemed contaminated unless otherwise determined by QA. Input from QA to evaluate sample results for project specific circumstances is required. The Contractor shall be required to halt lead activities and take corrective measures to reduce lead concentrations (misting, wet wiping, and HEPA vacuuming, etc). Work may not commence until the source of the contamination has been identified and the area decontaminated if needed, and additional samples have been collected to verify acceptable levels.

12) For lead work, clearance sampling shall be conducted in work areas in accordance with Department of Housing and Urban Development's "Guidance for the Evaluation and Control of Lead-Based Paint Hazards in Housing," Chapter 15, June 1995. As allowed per HUD regulations, Chapter 14, 4. (p. 14-16) and Chapter 15, IV, C (p.15-11), use sealants

on surfaces before wipe sampling clearance is conducted except as otherwise noted in specifications. Clearance wipe sampling is only required for uncontained dust generating activities. Visual inspection is required for all LBP activities. Work areas will be considered appropriate for re-occupancy when the following conditions are met:

Floors/Baseboards:	<40 micrograms per square foot
Window Sills:	<250 micrograms per square foot
Window Well:	<400 micrograms per square foot
Exterior Concrete or other Rough Surfaces	< 800 micrograms per square foot

Wipe and soil samples shall be analyzed via EPA SW-846 method 7420.
The contractor must achieve these clearance levels in all regulated areas regardless of baseline levels. For areas outside the regulated work area if background wipe samples collected by the QA indicate a baseline level of surface contamination greater than those defined above, the contractor will only be required to clean to the baseline level.

Soil samples shall also be collected by QA, in addition to wipe samples, for exterior work. Clearance criteria is <400 ppm (mg/kg) or lower than baseline levels.

13) The QA 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.

14) The QA 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.

15) The QA is responsible for ensuring 8 hour TWA personal monitoring air samples in workers breathing zone per OSHA regulations is performed daily by Abatement Contractor or its air monitoring firm.

B. Laboratory Testing and Analysis

1) For asbestos, analysis of required air test shall be performed by Phase Contrast Microscopy (PCM) per NIOSH 7400 method. Required TEM samples shall be analyzed using EPA Level II (AHERA) methodology recognizing fiber length of .5 microns and aspect ratio of 5:1. 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.

2) 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.

C. Reports Required:

1) Action Plan Reports. The QA 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.

2) Inspection Reports. Brief, but complete daily inspection reports concerning the daily activities and progress of the Asbestos Abatement Contractor and QA 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 rotameter calibration, total number of liters of air drawn, pump time on and time off. Special reports, verbal reports, including documents required by Paragraph 2.A.3., shall be submitted as necessary. Photographs should be taken as needed.

3) Analysis Reports. The QA 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.

4) Final Report. At the close of each Asbestos Abatement Project, the QA shall submit a three-part Final Report.

Part 1 shall include all project documentation including, sample location maps, sample collection data, photographs, daily logs, and sample analysis reports. Organize report, by date, in ascending chronological order.

Part 2 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.

Part 3 shall contain complete documentation pertaining to Paragraph 2.A.3., concerning the preservation of evidence related to asbestos and its removal.

5) Report Submission. Five (5) copies of all reports must be submitted to the Professional who will make the distribution to the Department.

6) All samples must be archived and/or preserved adequately by the laboratory of the QA for one (1) year. Prior to disposing of the samples, the QA must give the Department at least thirty (30) days written notice.

BREAKDOWN FOR QUALITY ASSURANCE HAZMAT MONITORING
ASBESTOS AND LEAD RELATED ACTIVITIES

Based on the number of estimated days provided for the duration of asbestos/lead activities and the Unit Prices below, provide a not-to-exceed total cost. Estimate number of samples, hours, etc.

The minimum proposal requirements for asbestos/lead Quality Assurance Hazmat Monitoring shall be as hereinbefore described and/or per the Project Specification section(s) and Drawings. In addition, the QA firm must be certified to perform asbestos work in the city of Philadelphia, per the requirements of Air Management Services, when applicable.

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.

A. Fee for Project Manager: _____ hours @ $_____ /hour = $_____

B. Fee for Environmental/Industrial Hygienist Technician (includes travel, equipment, motel, subsistence, on-site meetings, and other associated costs): _____ shifts @ $_____ /shift = $_____
   - Monday through Friday [*Prof. to insert estimated # of shifts*]
   - Includes up to 8.5 hours on site
   - Includes up to 10 asbestos PCM air samples, and 8 lead samples per shift

C. Fee for Final Report (5 copies): $_____

TOTAL NOT-TO-EXCEED COST (A + B + C) **$_____**

D. Unit Costs:

Additional Fee for Environmental/Industrial Hygienist Technician
- Hours in excess of 8.5 hours per shift $_____ /hour

Additional air samples analysis via PCM $_____ /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

BREAKDOWN FOR QUALITY ASSURANCE HAZMAT MONITORING
ASBESTOS-RELATED ACTIVITIES

Based on the number of estimated days provided for the duration of asbestos activities and the Unit Prices below, provide a not-to-exceed total cost. Estimate number of samples, hours, etc.

The minimum proposal requirements for asbestos Quality Assurance Hazmat Monitoring shall be as hereinbefore described and/or per the Project Specification section(s) and Drawings. In addition, the QA firm must be certified to perform asbestos work in the city of Philadelphia, per the requirements of Air Management Services, when applicable.

Daily QA services shall be provided when asbestos work is taking place. QA firm shall schedule on-site personnel accordingly, not to exceed the number of days estimated in their Proposal.

A. Fee for Project Manager: _____ hours @ $_____ /hour = $_____

B. Fee for Environmental/Industrial Hygienist Technician (includes travel, equipment, motel, associated costs): _____ shifts @ $_____ /shift = $_____
   - Monday through Friday [*Prof. to insert estimated # of shifts*]
   - Includes up to 8.5 hours on site
   - Includes up to 10 asbestos PCM air samples per shift

C. Fee for Final Report (5 copies): $_____

TOTAL NOT-TO-EXCEED COST (A + B + C) **$_____**

D. Unit Costs:

Additional Fee for Environmental/Industrial Hygienist Technician - Hours in excess of 8.5 hours per shift	$_____ /hour
Additional air samples analysis via PCM	$_____ /sample
Bulk sample analysis	$_____ /sample
Air sample analysis via TEM (24 hour turnaround)	$_____ /sample
Air sample analysis via TEM (48 hour turnaround)	$_____ /sample
TCLP (3 day turnaround)	$_____ /sample
Other	$_____ /sample