

School Building Authority of West Virginia  
**POLICIES & PROCEDURES HANDBOOK**  
**SUMMARY OF REVISIONS**

**Appendix F**

**1. a-c**

Project Development – These changes formalize the process currently in place and assures SBA involvement in project development, and requires counties to meet with the SBA staff during the conceptual stages of project development.

**2. b**

Project review criteria – These changes reflect the legislative language currently in place and formalizes the 9<sup>th</sup> criteria used in project evaluations relating to the effective and efficient use of state funding for the projects being considered.

**3.d**

SBA staff involvement in the project presentation – This new language requires the county boards to work with the SBA staff as they prepare for their interviews to ensure they provide the Authority a thorough understanding of each project’s scope of work and costs.

**Appendix I**

Architectural/Engineering and construction regulations project design services – These changes simply separates the procedures for hiring architects/engineers from the construction manager service.

**I.B.**

SBA Supplemental Conditions to the Owner/Architect Agreement – This new language provides a schedule for the introduction of Building Information Modeling (BIM) into school designs.

**I.D.**

Require Architects/Engineers to release building design CAD files to trades contractors and construction managers for their use in coordination of all work.

**I.G.**

Prototypical School Design – Requires County Boards of Education to consider prototypical schools previously designed as their new schools are planned.

**I.H.**

New supplemental language to the Owner/Architect agreement – This new language requires Architect/Engineer to pay for change orders relating to Construction Analyst (CA)/Construction Manager (CM) or SBA review comments not incorporated into the bidding documents that result in a construction change order. This new language also limits the use of owner contingency funding for change orders relating to Architect/Engineer errors and omissions.

## **II.A.**

New supplemental language regarding Safe School Design – This supplemental language applied to the Owner/Architect agreement eliminates current design requirements relating to crime prevention and inserts new language that requires Architects/Engineers to review and incorporate school access safety design elements into the project that reflects the schools vulnerability and risk assessment study performed during the SBA School Access Safety Program.

## **II.D.**

This new policy requires County Boards of Education to perform more stringent site feasibility studies prior to purchasing property for school constructions.

## **II.R.**

Project Closeout Requirements – This new language strengthens the current requirements for the evaluation of Contractors and Architects/Engineers, by requiring SBA staff involvement in the evaluation process.

## **PROFESSIONAL SERVICES OF THE CONSTRUCTION MANAGER**

Revises current language regarding Construction Managers and creates a Construction Manager(s) as an agent of the SBA.

## **EDUCATIONAL SPECIFICATIONS**

Establishes new requirements for County Boards of Education that inserts an SBA representative into the educational planning process in lieu of the Architects acting as the Educational Facilities Planner.

## **Appendix J.**

**6.1.4** Penalties for Noncompliant Performance – These changes strengthen current policy regarding penalties for poor or noncompliant work and adds failure to comply with the project schedule or phasing plan as an offense that will place the contractor on the probationary list and subject to a minimum of 1 year suspension from bidding on SBA projects.

**6.3.2.8-9** Project Schedule Confirmation – Changes in these articles require all prime contractors to take creative action on their subcontractors requiring them to comply with the construction schedule.

## **SBA FORMS**

### **189**

Contract service responsibilities summary for County, Architect and Constructions Manager - This new form creates a matrix of responsibilities for all contracting parties.

### **190**

Building Information Modeling (BIM) Guidelines and Standards – This new form creates requirements for Building Information Modeling (BIM) and describes deliverables for design firms.

**191**

Building Information Modeling Proficiency Matrix – The Building Information Modeling experience level of the design team and contractors prior to beginning the projects.

**192**

Building Information Modeling Implementation Plan – This new form establishes requirements for the design firm to follow based on the level of development required for the design model.

SBA Policy and Procedures  
**APPENDIX F**

School Building Authority of West Virginia  
**PROCEDURES FOR DEVELOPMENT AND REVIEW OF  
CONSTRUCTION FUND PROJECTS**  
(Needs Funding)

The SBA staff will utilize the following approach to review the projects submitted by each county for competitive school construction funding.

Each county in West Virginia who has an approved CEFP is eligible for capital improvement funds from the SBA based on the needs of the facilities in their district.

Each county shall work with the SBA staff to evaluate the needs of the facilities as indicated in the CEFP.

Each county is responsible for determining in their facilities plan the specific project(s) for which SBA school construction funds will be requested. This individual project will be fully developed by the county working with the SBA staff, in regard to the issues indicated in Section 1.1 of the SBA Policy and Procedures Handbook and have a SBA School Construction Fund Project Summary Report completed.

Proposals for school construction fund projects must be part of an approved CEFP, and submitted at the request of the Authority based upon the availability of funds for distribution. Provide two (2) hard bound copies and one (1) electronic PDF file.

The Authority will review and evaluate the projects based upon criteria set forth in 1.1 of the SBA Policy and Procedures Handbook. A prioritized list of projects to be funded equal to the amount of the funds available during the specific funding cycle will be developed by the Authority.

The Authority reserves the right to request review of any or all projects submitted to them that they feel has special merit or extenuating circumstances.

1. Development of the Competitive School Construction Fund Project.

- a. Each county shall work with the SBA staff to evaluate the needs of the county's facilities based on the conditions described in the CEFP. Discussions should focus on the projects impact on the county's preventative maintenance plan, as well as, the impact on county's efforts to operate more efficiently.
  
- b. The proposed project, whether it is a new facility or an addition/renovation, should focus on improving efficiencies within the school district and shall be developed with integral involvement of the SBA staff.

- (1) If the proposed project is to be the construction of a new facility, SBA funding will be determined on the SBA funding formula. Should the county desire additional square footage above the SBA funding formula or to utilize property with abnormal site conditions, additional local funds may be needed to complete the desired increase in project scope. Should design professionals and/or cost estimating professionals be needed to assist in determining the additional scope of work or potential additional funds needed to complete the desired project, the SBA staff will assist in the advertisement and hiring process for the necessary services.
- (2) Should the proposed project be an addition, renovations or mechanical/electrical system upgrade to an existing facility, the SBA staff shall assist in developing an understanding of the desired scope of work prior to the involvement of design professionals. Once the scope of work is defined, the SBA staff will assist in the advertisement and hiring process of the appropriate professional services and together the final scope of work will be determined.
- c. Once an understanding of the proposed project scope has been developed, the SBA staff will assist with the completion of the required documentation to ensure an accurate representation of the proposed project is submitted for SBA funding consideration.

4. 2. Review of the competitive school construction fund projects

- a. The SBA staff will evaluate the school construction fund projects in accordance with WV Code 18-9D-16 as well as the mission and goals of the Authority as in 18-9D-15.
- b. This review will utilize the following criteria to evaluate and make recommendations concerning merit for school construction funding.
  - (1) Health and safety
  - (2) Economies of Scale
  - (3) Travel Time and Demographics
  - (4) Multi-county/Regional Aspects
  - (5) Curriculum and Instruction Improvement
  - (6) Educational Innovations
  - (7) Adequate Space for Projected Enrollment
  - (8) History of local funding efforts  
(to the extent constitutionally permissible)
  - (9) Effective and Efficient Use of Funding

~~2.~~ 3. Verification of Evaluations of Existing Facilities – School Construction Fund Projects

c. An on-site evaluation report will be prepared by the SBA staff for all school construction fund projects throughout the state as identified by the Authority. This report will:

- (1) Verify the scope of the project
- (2) Assess cost estimates of proposed facilities
- (3) Evaluate the feasibility of the project
- (4) Consider the option of new vs. renovation
- (5) Address transportation and demographic issues

d. During the on-site review and prior to the Superintendent interview, the SBA staff will assist in developing the presentation to be used in an effort to provide the Authority Members a thorough understanding of the proposed project.

3. 4. The on-site evaluation report will be provided to the Authority for consideration in their deliberation and final selection of projects to be funded from the construction funds account.

4. 5. Administrative Interview

Before the Authority determines the statewide prioritized list, members will identify projects where specific questions or clarifications are needed in order to consider the project for funding. Superintendents and county board presidents will be asked to appear before the Authority to make presentations regarding their individual projects and to answer questions of the Authority members.

Upon a majority affirmative vote of the members present, the interviews may be held in Executive Session in accordance with WV Code 6-9A-4 (9) which provides that such session may be held for: “matters involving or affecting the purchase, sale or lease of property, advance construction planning, the investment of public funds or other matters involving competition which, if made public, might adversely affect the financial or other interest of the state or any political subdivision.”

a. Purpose of the Interviews

- (1) To provide an opportunity for the local board of education to express the importance of the project to the school system and its impact on the students who will attend the school;
- (2) To clarify any issue or question regarding the project;
- (3) To familiarize the SBA Members with individual projects and provide opportunity for questions prior to funding deliberations.

b. Interview Format

- (1) A short presentation by the county administration emphasizing both cost savings to be gained as well as educational opportunities

to be achieved should the project be funded. A strict limitation of 5 minutes for oral presentations by each county will be enforced by the Authority.

- (2) Questions will be asked by the SBA Members concerning the project. A 10 minute limitation will be used for this phase of the interview component.

c. Content of the Superintendent's Comments

- (1) The presentation should address the specific costs and savings as can best be estimated from the data available to the administration. This should include such items as transportation, personnel, O & M and administrative costs.
- (2) Projected timelines should be provided on the completion of design, bidding and construction components. Status of the project including architectural designs, site selection, and/or other work that has been completed prior to the interview date should be emphasized.
- (3) Any handouts and/or photos that will help clearly address the need of this project, its impact on the quality of education, and the efficiency of administering the county school system may be utilized during the interview process.
- (4) Be prepared to work with the SBA to develop a project budget for the construction of the proposed facility during this session.

~~5.~~ 6. After these steps are completed, the Authority will have gathered and compiled sufficient data to make judgmental decisions as to which projects will be funded through school construction fund grants.

~~6.~~ 7. Prior to final action on approving projects for funding, the Authority shall submit a certified list of the projects to the Joint Committee of Government and Finance.

**SBA Policy and Procedures**  
**APPENDIX I**

## ARCHITECTURAL/ENGINEERING & CONSTRUCTION REGULATIONS

**THE FOLLOWING INFORMATION PROVIDES INSTRUCTION AND DIRECTION WITH REGARDS TO PROJECT DEVELOPMENT THROUGH CLOSEOUT. DEVIATION FROM REQUIREMENTS MUST BE APPROVED BY THE SBA.**

### **I. PROJECT AND DESIGN SERVICES**

- A. Application for Project Approval (WVDE/SBA P-1 Report – Rev. 12/11/91)

This report is to be submitted twice by the county, initially with the blueprints when they are submitted to the SDE and the SBA for review, and a final WVDE P-1 is to be submitted to the SDE and the SBA at the completion of the project with a WVDE BP-13-A or SBA Form 139 completion report.

- B. Procurement of Architectural/Engineering and ~~Construction Management~~ Services

State agencies and their political subdivisions are required to comply with Article 1, Chapter 5G of the West Virginia Code regarding Procurement of Architectural, Engineering and ~~Construction Management~~ Services. All grant recipients are required to submit to the SBA office staff the names of the firms being considered to perform architectural, engineering design, or, if required, ~~construction management~~ or construction analyst services on all projects where budget is fully or partially funded by the SBA. Unless, otherwise authorized by the Authority, the architectural, engineering and ~~construction management~~ services shall be performed by companies within the State of West Virginia and must be licensed to perform the desired services in the State of West Virginia. In order to fully comply with this requirement, the following procedures must be followed:

- Submit the list of firms showing interest in performing design or ~~construction management~~ services to the SBA office staff upon receipt for review and approval prior to developing the “short” list for interviews.
- Submit the “short” list of at least three firms, two of which must be West Virginia resident firms, being considered to be the most qualified for the services required to the SBA office staff for review, prior to interviewing the firms.
- Architectural and Engineering firms being considered for the building design, must be informed at the time of their interview that the SBA requires that the work pertaining to each professional design discipline, i.e.: Architectural, Mechanical, Electrical, Civil and Structural be performed by a certified and

licensed individual of that discipline. Architectural firms will submit the firm names and certificates of each individual design discipline in their project interview. Performance of this work by individuals licensed in the appropriate discipline will be verified by submission of bid and design documents to the SBA that have stamped A/E seals on those sections pertaining to that discipline.

- Once the interviews have been conducted, the firms shall be ranked in order of preference. The preferred list shall be forwarded to the SBA office staff for review and approval, prior to further negotiation or recommendation to the local board of education or governing body making final approval.
- Additionally, the SBA requires that engineering design professionals performing services on all SBA funded projects meet the following criteria:
  1. The engineer of record must be a registrant in good standing with the State of West Virginia Board of Professional Engineers,
  2. The designer must be a registered professional engineer, licensed in the State of West Virginia in a specific engineering discipline,
  3. The engineer must be trained and registered in the specific discipline associated with the work being designed, and place his/her seal only on engineering designs for their specific discipline(s),
  4. The engineer shall only place their seal on plans for school projects that were prepared by him/her or under his/her direct supervision, and
  5. The engineering firm must be registered to conduct business in the State of West Virginia and hold a certificate of authorization from the West Virginia Board of Professional Engineers.

Upon request, grant recipients may be required to submit qualification information from each of the firms being considered to the SBA.

The SBA encourages the use of standard AIA construction documents and agreements. Utilization of a Construction Manager or Construction Analyst may be required by the School Building Authority on a project by project basis. However, the SBA may require supplemental languages be amended into these documents.

*\*Add the following to AIA B101, Article 3.6.2.1 and Article 4.3.3\*:*

The architectural firm may utilize a Construction Administrator for project oversight and to attend all construction progress meetings, however, the Project Architect and Engineer responsible for the design shall be present at the project site to attend a minimum of one project meeting per month. This person must have authority to render decisions on the project in order to avoid unnecessary delays.

*Add the following to AIA B101, Article 12:*

~~Construction projects funded by the School Building Authority, beginning in April 2015, will be designed and constructed using the Building Information Modeling (BIM) delivery method.~~

The School Building Authority intends to implement Building Information Modeling (BIM) for design and construction of SBA funded projects as follows:

- New School Construction Projects beginning in December 2015
- All New School Construction and Major Addition and Renovation Projects beginning in December 2016
- Implementation of BIM on all projects beginning December 2017.
- BIM modeling information data provided to the owners for use in their preventative maintenance data bases state wide by 2019.

C. Design Fees

Design fees shall be calculated based on a percentage of the construction cost. Construction costs are calculated based on the lowest acceptable qualified bid(s) for constructing the building. Basic design fees shall include all services necessary to complete the project including, but not limited to architectural, plumbing, electrical, mechanical and civil engineering, as well as construction administration through project completion. Additional services must be approved by the SBA. The cost for alternative designs that are not constructed shall be borne by the grant recipient unless approved by the SBA. Construction costs does not include fees for the construction manager, clerk-of-the-works, construction analyst (paid for under additional services), legal fees, site acquisition or other project cost not directly associated with the construction of the building. Architect and engineering fees may also be applied to the cost of furniture and equipment only if the architect prepares the contract documents and administers the contract for the installation of the furniture and equipment. Maximum SBA reimbursement for architectural and engineering fees will be in accordance with the most current SBA fee schedule (SBA Form 175). The educational agency may agree to pay fees in excess of the maximum SBA amount; however, the additional cost for these fees will be the responsibility of the educational agency. Reimbursable expenses for document printing and distribution for agency approval shall be paid from grant funds as a direct cost plus reasonable and customary overhead and profit.

D. Architectural and Engineering Fees

The SBA fee schedule must be used for all projects when SBA funding is provided. Grant recipients must use Standard AIA agreements and contract document forms ~~or request~~ unless SBA approval to use alternative agreements, is

granted. Architectural and Engineering (A&E) fees are established by the SBA and should be considered as the maximum allowable to receive SBA reimbursement. Should the grant recipients choose to exceed the SBA maximum allowable design service fees, the difference in cost will be the responsibility of the grant recipient.

SBA reimbursements of A&E design service fees shall be based on a percentage of the actual construction cost for contracts awarded. Fees associated with alternative designs not awarded will be the responsibility of the grant recipient and paid as additional services by the grant recipient. Fixed fees based on percentages of the construction cost will be calculated using the most current SBA approved fee schedule times the actual construction cost. For purposes of calculating design service fees based on a percentage of the construction cost, construction costs include the value of construction contracts awarded construction and the cost of furniture and equipment where the architect provided professional services associated with the preparation of bidding documents for the furniture and equipment. A&E fees relating to construction change orders shall be calculated at the same percentage established for the project based on the approved construction budget once established under Section H (Fees Relating to Change Orders). Incidental reimbursable expenses for surveys or other pre-approved project expenses may also be paid from project funds. A stipulated sum design service contract may also be used with the approval of the SBA office. Stipulated sum fees would be based on an amount agreed upon by both parties for professional services regardless of the construction cost.

A&E fees paid to the Design Team, in accordance with the SBA Fee Schedule, shall include reasonable use of CADD files by the Contractors for trade coordination purposes through completion of the project. Release documentation for the CADD files may be required by the Design Team. However, no additional fee shall be charged to the contractor or subcontractor for the use of the CADD files..

*Revise AIA, B101, Article 6.1 to read as follows:*

Construction costs do not include costs associated for a construction manager, clerk-of-the-works, construction analyst, licenses, permits, B&O taxes and change orders caused by A&E errors and omissions or change orders which do not require the services of the A&E firm. Fees associated with construction change orders will be reviewed by the SBA and the owner and additional professional service fees will be paid based on services required to effectuate the construction change.

#### E. Fee Modifications

Consideration will be given to modifying the SBA fee structure if a particular project is considerably more complex or if the project requires substantially more

special consultants to complete. Fee modifications will be negotiated during the A & E procurement process and approved by the SBA before design service contracts are executed.

F. Multiple Prime Contracting Fees

The Basic Service Fee schedule may be adjusted for multiple prime construction contracts at the discretion of the SBA. Compensation for additional services for multiple prime construction contract administration shall be negotiated based on the number and complexity of the contracts. The maximum SBA reimbursement for compensation for administration of multiple prime contracts shall not exceed the SBA A&E fee schedule amounts without approval of the SBA.

G. Prototypical School Design Fees

The West Virginia Legislature encourages the use of prototypical designs where possible in West Virginia public schools. Where SBA funding is provided, county boards of education ~~shall~~ must consider prototypical school designs. Should the County Board feel that a prototypical school design does not adequately address the educational needs of a facility, the County Board must submit a written justification to the SBA Director of Architectural Services explaining their reasons for not considering prototypical designs that may be available. Approval must be granted by the SBA prior to proceeding without a prototypical design. Design service fees will be adjusted when prototypical designs are used. A&E fees are negotiable and will be based on services required. The basic service fee for an original design shall be 100% of the maximum allowable based on the SBA fee schedule. To the extent possible, design firms shall prototype academic areas of all facilities.

Should the county board elect to use a prototype school design, 100% of the negotiated percentage fee will be applied to the cost of the site preparation and improvements required to adapt the site to accommodate a prototypical school design, for bidding and negotiations and for construction administration services. The design service fee for the reuse of an original design may not be greater than 40% of the design service phases of the original school designs. A&E fees for projects where substantial portions of the design are duplicated from previously designed projects will be adjusted based on the percentage of design duplication. For prototypical school projects, the total fee shall never exceed the maximum allowable fee percentage for the project had the prototypical design not been used.

H. A&E Fees Relating to Change Orders

*Add the following to AIA B 101, Article 11.3, Items 1-4:*

Fee adjustments for owner requested change orders, or change orders intended to improve overall quality of the facility will be considered. Compensation will be based on the amount of design, coordination and/or construction administration

required to effectuate the change. Fee adjustments must be approved by the SBA. A&E fees for change orders not requiring design changes should be negotiated as an additional service and reimbursed on an hourly basis.

A&E fee modifications for change orders for new construction that requires construction document amendments due to design deficiencies will be reviewed on an individual basis by the owner and the SBA and fee adjustments considered if construction has not taken place in the affected area. The owner will pay for the required labor and material cost to effectuate the change. The A&E fee will only be adjusted based on A&E services required to effectuate the change in the scope of work.

A&E fee modifications for change orders on new construction that requires construction document amendments due to items of work inadvertently omitted from construction documents where the construction has taken place in the affected area and demolition is required will be reviewed on an individual basis by the owner and the SBA. If it is determined that the problem should have been resolved by the A&E firm within the building design, the owner will pay for the required change order and the A&E firm will be back-charged for the change including any demolition and replacement costs plus contractor overhead and profit. The owner will deduct any added value construction received as a result of the change from the amount the A&E firm is being back-charged.

*Add the following to AIA B 101, Article 12:*

A&E fee modifications for change orders on renovation and addition projects will be addressed on an individual project basis. If construction changes are required due to owner requested changes, incorrect as-built information or if it is determined by the owner and the SBA that a condition has occurred that could not have been foreseen by the A&E firm, the A&E firm will be compensated for the design modification based on the additional services required to effectuate the change in work.

If the SBA or owner assigns a construction manager (CM) or construction analyst (CA) to a project, CM and/or CA review comments relative to the clarity of the design intent shall be incorporated into the documents by the A/E unless the A/E determines that the clarifications conflict with applicable codes or standards. The A/E will notify the owner and SBA of comments not being incorporated into the documents. However, should clarification comments not being incorporated into the document result in construction change orders, the SBA will not provide funding for the change orders required to incorporate work into project relating to the review comments.

Contingency allowances shall be established at two percent (2%) and four percent (4%) for each renovation project. Fifty percent (50%) of those contingencies shall be established for Owner requested changes. The remaining fifty percent

(50%) shall be established for errors and omissions of the design team. Should the errors and omissions exceed the fifty percent (50%) allocated in the contingency allowance, all additional funds necessary to correct the errors and/or omissions will be the responsibility of the design professional.

I. Reimbursable Expenses

All design and construction service costs for the project shall be included in the basic service agreement including the cost of design, redesign (with exception of owner requested design changes after approval is granted to proceed into the construction document phase), construction administration and other project development costs. The county board will reimburse the A&E firm for the cost of review and bidding document printing and distribution to perspective bidders and approval agencies.

*Add the following to AIA B101, Article 12:*

- J. Additional Services Special consultants required by the A&E firm for complex projects will be paid as an additional service by the grant recipient. Special consultants must be approved by the owner and the SBA prior to their use. HVAC Testing, Adjusting and Balancing services shall be contracted directly to the county board. Geotechnical services shall also be contracted directly to the county board (or other grant recipients) unless SBA approval is granted to contract this service to the A & E firm.

Specialty consultants used by the A & E Firm for the development of project drawings and/or specifications shall not bid on any portion of the construction project. Consultants found to be submitting bids on such projects will be disqualified.

**II. PROJECT REQUIREMENTS**

A. Building Component Requirements

Every effort must be made to plan and design schools with quality HVAC systems and low maintenance hard surface finishes. The SBA Quality and Performance Standards must also be incorporated, where applicable, into building design criteria for all projects approved after June 2008. Deviations from these standards must be approved by the SBA. With this in mind, design architects and engineers must consider various prioritized options within the building design that address the following:

1. Quality HVAC systems must be installed in all schools. These systems must be capable of providing efficient, long term climate control, complying with the minimum standards established by the SBA

- performance criteria. Buildings must also be designed with durable, low maintenance building finishes;
2. The HVAC Testing, Adjusting and Balancing (TAB) agent shall be certified according to the procedures contained in the associated air balance council (AABC) national standards, the national environmental balancing bureau (NEBB) procedural standards or the environmental engineering consultants (EEC) standards for testing, adjusting and balancing. The TAB agent shall directly represent and is under direct contract with the building owner and shall coordinate scheduling of TAB start up and completion work with the mechanical contractor, mechanical engineer, SBA, architect and construction manager, where applicable, ~~and~~ These services shall be paid from available project funds.
  3. SBA or local funds will not be used to construct building square footage that will result in the inefficient use of the facility in sacrifice of a quality HVAC system or building finishes;
  4. Once the square footage of the building academic and support spaces has been approved by the SBA, first consideration must be given to quality HVAC systems and building finishes. If local funds are proposed at any time throughout the project development, these funds and their intended use must be identified and approved by the SBA, and;
  5. HVAC control systems shall be bid on a performance based specification, identifying at least three acceptable manufacturers, who are capable of meeting the specification. HVAC contractors shall solicit proposals from these manufacturers as the basis for their bid. Should the local Board of Education desire a specific control system, manufacturer or integration of other building systems with the HVAC controls, these systems shall be bid as alternates and any additional costs associated shall be borne by the ~~County~~ local Board of Education.
  6. Additional SBA funding for project overruns will only be considered if Items D 1-5 are satisfied and additional funds are required in order to award the basic bid to the lowest qualified bidder(s).

*Add the following to AIA B101, Article 12:*

#### Building Component Requirements – Safe School Design

The SBA recognizes the need to incorporate safe school design into West Virginia's new schools. Wherever possible, designers should incorporate safe schools through environmental design philosophies into the new school designs. ~~Crime Prevention through Environmental Design (CPTED) concepts should be included in the school design and a CPTED Analysis should be incorporated into the school planning process.~~ Consideration should also be given to the vulnerability and risk assessment study performed in each county of all schools and cited review comments incorporated into the school design. Additionally, educational agencies shall consider security within the facility and work with local law enforcement agencies during the building design process to incorporate

local school access safety plan concepts into the new school design. Minimally, the following should be considered:

1. Limit the number of buildings within the design to one building, if possible.
2. Minimize unsupervised entrances into the building. Unsupervised entrances should be locked and equipped with emergency exiting hardware only.
3. Limit site access and if possible, provide a security person at the site entrance.
4. Provide drop-off and pick-up lanes for school bus use only.
5. Minimize the number of driveways and parking areas students cross to enter or leave the school campus.
6. Provide interior building security that would allow classroom areas to be closed and locked off from gym areas and other areas of the facility being ~~used~~ utilized during off school hours.
7. Minimize areas of the building and campus that cannot be easily supervised by administration and staff (i.e., alcoves, recesses in walls, short perpendicular corridors into classrooms).
8. Place elementary student lockers in classroom, where feasible, so that access can be monitored by staff. Locker locations should always be placed close to supervision and designed for easy surveillance.
9. Provide for two-way communication within student occupied areas of the building. Include the ability to communicate outside the school should telephone service be interrupted.
10. Install basic security systems throughout the facility and appropriate video monitoring in non-supervised and high student concentration areas.
11. Provide adequate exterior lighting including parking lot lighting.
12. Landscaping should consist of small shrubs below three feet in height and large trees that keep the visual zone between three feet and six feet in height unimpaired.

Note: Grant recipients and school planners shall work cooperatively with the State Office of Homeland Security (OHS) and other public safety agencies during the planning and design phases of all projects. At the conclusion of all new school projects and projects that alter the building square footage or layout, the grant recipient/architect shall provide the OHS an electronic copy of the building design that complies with the requirements of the SBA school access safety provision and the most current OHS school access safety submission requirements.

#### B. Disqualification of Contractors/ Probationary Contractors

Construction contractors or subcontractors on probationary status or who have had a contract terminated for just cause as described in the AIA Document A201 or A201/CMA General Conditions Article 14, Section 14.2 will be prohibited from bidding projects funded by the School Building Authority for a minimum of one year and pending review of the SBA thereafter. The architect/engineer shall

secure a list of probationary contractors from the SBA prior to issuing bidding documents and contractors on SBA probation shall not be issued bidding documents.

#### C. Construction Project Development

Renovation and addition projects typically evolve from conceptual ideas derived from county curriculum and facilities personnel. Programmatic information is provided through the educational specifications developed by the County and the SBA to the architect/engineer who develops graphic illustrations that show general space relationships and curricular areas. The architect develops these ideas into a complete set of construction project documents by utilizing the following phases:

- Site Feasibility Study
- Planning/Educational Specifications
- Schematic Design Phase
- Design Development Phase
- Construction Document Phase
- Bidding and Negotiation Phase
- Construction Phase

It is extremely important that all requirements of each project development phase be met before proceeding to the next phase. To avoid cost overruns and possible redesign cost, project costs must be monitored during the schematic design, design development and construction document phases. All contractual agreements with architects/engineers or construction managers must include language that requires the architect/engineers or construction managers to submit all planning and project design information and estimates of probable cost to the School Building Authority and the county board of education for approval. The School Building Authority, the county board of education, the curriculum and facilities planning team and the architect should be in agreement before proceeding from one phase to the next.

- The design includes all curricular and facilities requirements proposed by the planning team and the School Building Authority or an explanation as to why these requirements are not being provided;
- The project as designed can be constructed within the budget provided by the county board;
- And the project is being constructed on an approved site for which a clear and free deed is held by the grantee. The use of leased properties must receive prior approval of the SBA.

#### D. Construction Project Submission, Delays and SBA Review

All construction projects funded by the School Building Authority are required to be submitted for review to the School Building Authority staff. A 14 day review

period shall be included in each phase of the project development schedule for SBA review of planning, schematic, design development and construction documents. Project documentation as required by Form SBA 176 A-E of the School Building Authority Policy and Procedure Handbook must be submitted. Minimally, the School Building Authority must review and approve the site feasibility study, educational specifications, schematic drawings, design development documents and final construction documents as they are developed. Estimates of probable cost must be submitted with each phase of the project approval process. Educational specifications must be submitted with schematic designs for SBA review. Specific requirements regarding the project educational specification can be found in Appendix I. ~~A formal site feasibility study must be prepared by the project architect/engineer before proceeding with the purchase of any site for construction.~~ Site feasibility studies shall be performed on all sites being considered for new school construction. Feasibility studies shall include, but not be limited to, utility availability, subsurface soil conditions, as well as an estimate to prepare the site for building construction. Should the local board of education desire to construct the new facility on a site where construction costs are estimated higher than those deemed reasonable and customary by the SBA for a school of similar size, all additional cost to prepare the site for construction of the school shall be the responsibility of the local Board of Education. Consideration must be given to all factors identified in State Board Policy 6200 “Handbook on Planning School Facilities”, Chapter 2. ~~The site feasibility study must include all site development costs for each site being considered.~~ The site feasibility study along with the recommendation for the preferred site must be submitted to the SBA for approval before proceeding with the acquisition of any site.

Projects shall not be advertised for bid or construction started until after the School Building Authority staff has reviewed the submitted documents and the School Building Authority review comments have been satisfactorily addressed. A revised set of bidding documents must be submitted to the SBA office along with assurances that review comments have been addressed within the final documents. Additionally, SBA submission requirements are included on the school construction project development flow chart.

#### E. Real Estate Acquisitions Using School Building Authority Funds

In order to maximize the limited amount of School Building Authority funding for the construction of educational facilities, the School Building Authority has taken the following action:

- The Authority will not approve any Grants which include the funding of real estate acquisitions with grant proceeds.
- The Authority will not approve amendments to any Grants which include the funding of real estate acquisitions with grant proceeds.

F. Clerk-of-the-Works Requirements

The educational agency shall be required to employ a clerk-of-the-works to monitor all construction projects in excess of \$250,000 unless waived by the SBA, or an SBA approved construction management method is being utilized. Candidates for ~~construction managers and~~ clerk-of-the-works shall be submitted for SBA review prior to final selection by the educational agency. A clerk-of-the-works employed by the county through contracted services shall minimally be paid an amount equal to the basic hourly prevailing wage rate of a Journeyman Carpenter as determined by the West Virginia Department of Labor for the project location. The actual time the clerk-of-the-works begins to perform the duties may vary according to the project and the timing of the award of the construction contract. However, the clerk-of-the-works must be given sufficient time to acquaint themselves with the total scope of the project in order to be an effective part of the construction team.

The School Building Authority requires that the clerk-of-the-works be hired at the same time the project is let for bids. If delays are anticipated in the award of the bid or actual construction/renovation is not scheduled to begin immediately, the clerk-of-the-works must be hired prior to beginning construction and be provided with adequate time to become familiar with the project scope and to be prepared to assist with the project as soon as bids are received and the construction contract is executed. During the bidding process it is conceivable that the clerk-of-the-works may not be required to perform his duties full time.

Realizing that there are various types of projects requiring the appropriate construction review documentation, the responsibilities of the clerk-of-the-works will vary with the scope of each project. The clerk-of-the-works shall not circumvent or eliminate the normal construction responsibilities of the architect/engineer or contractor. However, when applicable, the clerk-of-the-works can be a vital member of the project team and can assist in the project observation and documentation process. ~~A construction analyst, if required by the SBA, shall be utilized during the design phases of a project.~~

G. Mandatory Pre-Bid Conference

So that bidding information is properly conveyed to all bidders and to clarify questions and the intent of the bidding requirement, contractors shall be required to attend mandatory pre-bid conferences. Bidding documents shall notice all bidders of this requirement and include language making this requirement a prerequisite to bidding the project. The requirements for having the pre-bid meeting may be waived by the SBA for special circumstances conditioned upon a written request to the SBA by the design professional. All substantive pre-bid

questions shall be addressed at the pre-bid meeting and if the bidding documents do not clarify the questions, a project addendum will be circulated to all bidders.

#### H. Construction Project Bid Coordination and Reporting

Construction bid dates must be coordinated through the SBA office. Project architects/engineers must contact the SBA office and identify the proposed bid date desired. The SBA office will coordinate the most appropriate bid date after considering other construction project bidding schedules. Every effort must be made to prevent similar construction projects from being bid in the same week and within the same region of the state to allow for maximum participation of bidders.

No bid dates shall be scheduled until confirmation that any and all permits required have been obtained by the Owner. These permits include, but are not limited to, environmental and utility connection permits (both temporary and permanent). Additionally, no building construction bid packages shall be scheduled until all permits are obtained and site preparation work is substantially complete.

Once released for bid by the SBA, bids shall be advertised in accordance with Chapter 59-3-1 of WV Code as a legal advertisement in a qualified statewide newspaper occurring within a period of 14 consecutive days with at least an interval of 6 full days between the date of the first and second publications. However, unless waived by the SBA, **NO** bid opening date shall be scheduled less than 21 days after the first publication date.

The School Building Authority is tracking construction square footage costs for total projects and various building components. Project bid tabulation documents are required to be faxed immediately to the School Building Authority office within 2 hours after construction bid openings are concluded. The tabulation sheet should be self-explanatory and include explanations of base bid pricing and all alternates being requested. The normal bid tabulation sheet prepared at the conclusion of the bid for county staff is acceptable. ~~The bid tabulation must accompany the list of subcontractors and major equipment and material suppliers list (SBA Form 123) from the apparent low bidder(s) also required to be forwarded to the School Building Authority Office within two (2) hours of the conclusion of the bid opening.~~ **Bid openings shall not be scheduled after 1:30 p.m.**, so that bidding information can be transmitted to the School Building Authority office the same business day. No construction contract shall be awarded without the School Building Authority review and approval of the construction bid and the contractor being recommended for the award. The School Building Authority will review the required post-bid documentation of the apparent low bidder(s) during the 72 hours immediately following the bid opening. During this timeframe the School Building Authority will not discuss bid results with bidding contractors until all documentation has been reviewed.

I. Contractor Evaluation (SBA 124)

The School Building Authority ~~requires~~ and the Owner shall, at the conclusion of the project, perform an ~~do~~ evaluations of all prime contractors performing work on School Building Authority projects. This information must be submitted to the SBA at the completion of each project as a part of the project closeout information and accompany the final contractor pay application. Our goal is to have each contractor's overall work performance evaluated and document a history of excellent, average or poor performance on several projects. This information will also be made available upon request to all grant recipients.

J. Architect/Engineer Evaluation (SBA 138)

The School Building Authority ~~requires~~ and the Owner shall, at the conclusion of the project, perform an ~~do~~ evaluations of all architects performing work on School Building Authority projects. This information must be submitted with the project closeout information provided to the SBA when final payment is requested by the grant recipient. The goal is to have each architect's overall work performance evaluated and document a history of excellent, average or poor performance on several projects. This information will also be made available upon request to all grant recipients.

K. Construction Observation Report (SBA 113)

Construction Observation Reports are required to be completed by the clerk-of-the-works or the project administrator to record the current status of construction projects. This report may also be used by project architect/engineers, if desirable. The timelines of the Project Observation Reports can be established by the project administrator and must be sent to the SBA office for review and approval.

L. Certificate of Project Completion (WVDE BP-13-A, Rev. 10/94)

A Certificate of Project Completion is submitted to the West Virginia Department of Education and the School Building Authority upon completion of each contract in order to effectuate a close-out. The BP-13-A or SBA Form 139 for Multiple Prime Project reports must be submitted to the SBA prior to the request for final payment. The grant recipient shall arrange an inspection tour with the appropriate officials including the School Building Authority field representative. No occupation of a new facility or renovated facility shall occur until a Certificate of Occupancy is provided by the fire marshal and the SBA provides notification approving the date the building is to be occupied. The county board of education (or building owner) must provide the SBA a copy of the Certificate of Substantial Completion indicating the building has been declared substantially complete and suitable for the owner to occupy along with a request for a SBA walk-thru for

permission to occupy the facility. The School Building Authority will retain five percent (5%) of the project cost until the completion report is executed including final inspection by the School Building Authority. The School Building Authority will provide the county board (or building owner) a list of required project closeout requirements when the project is 95% complete.

M. Reference to West Virginia Jobs Act and Employment Reporting

1. Any plan, specification and invitation to bid prepared by any architect or engineer shall make reference to the West Virginia Contractor Licensing Act informing any prospective bidder that contractor's license number must be included on any bid submission.
2. Grant recipients shall require their project architect to include language within all bidding documents that require all prime contractors and subcontractors that have employees on school property to provide assurances that all employees are in compliance with WV Code, Chapter 21, Article 1B and SBA Policy with regards to verifying legal employment status of all workers and with regards to registration of sexual offenders. (See SBA Forms 180,181, 182)

N . Semi-Proprietary Specifications

1. To encourage competitive bidding, the project specifications shall specify not less than three products, materials or equipment that meets the requirements of the specifications. The product, material or equipment used shall comply with the contract requirements.
2. In certain instances, a single product may be the only one that will comply with the specific design/function requirement.

O. Project Job Signs and Building Plaques

All SBA funded projects and major improvement funded projects shall have project job signs erected at the construction site. Project signs must be visible and readable from highways where possible. Specific information will be provided by the SBA to be included on the sign. Additional project information may be required or desirable. A sample of a typical project sign is provided within this document for both "Needs" (SBA 168) and "MIP" (SBA 169) funded projects. Construction details are provided within the contract documents.

Upon completion of any major SBA funded project of \$1 million or more, the architect shall design a building plaque for display in a prominent public area of the school. See the typical SBA project plaque design:

- (1) The name of the Governor;
- (2) The names of the President of the Senate and the Speaker of the House;

- (3) The members of the SBA;
- (4) The superintendent of schools, and
- (5) The members of the local board.

The SBA will be contacted for appropriate information to be included and final approval of the plaque design before its production. An example of a typical project plaque is included within this document. (SBA 170)

P. Heat, Ventilating and Air-Conditioning Test, Adjusting and Balancing Requirement

1. The HVAC Testing, Adjusting and Balancing (TAB) agent shall be certified according to the procedures contained in the Associated Air Balance Council National Standards, the National Environmental Balancing Bureau procedural standards or the Environmental Engineering Consultants standards for testing, adjusting and balancing. The TAB agent shall be under direct contract with and directly represent the building owner. The TAB contractor shall coordinate the earliest start date as well as partial and final completion schedule for each area of the building with the mechanical contractor and provide this information to the owner, architect and SBA. The TAB contractor shall complete the testing, adjusting and balancing in each area of the building within 30 days of the earliest start date. The owner will consider the start and completion dates prior to the award of the contract and award the contract based on the cost proposal and completion schedule. The successful TAB contractor shall provide two weeks advance notice to the mechanical contractor, owner, architect and SBA prior to each area being tested.

Q. Asbestos Abatement Requirements (If Required)

1. Contractor/vendors must show proof of having successfully completed an EPA approved training course. All certification must be current.
2. Contractor/workers must be licensed by the State of West Virginia to perform any or all types of asbestos inspection, project designing, management planning, contracting, abatement, supervision of abatement and air monitoring.
3. All contractors/vendors performing work using School Building Authority funding shall comply with all applicable codes and standards including but not limited to the requirement of:

Environmental Protection Agency (EPA)  
Occupational Safety and Health Administration (OSHA)  
Environmental Protection Agency Worker Protection Laws  
National Emission Standards for Hazardous Air Pollutants (NESHAP)

Asbestos Hazard Emergency Response Act (AHERA)  
West Virginia Department of Health  
West Virginia Department of Natural Resources  
West Virginia Air Pollution Control Commission

4. At the completion of all asbestos abatement projects and before final payment will be processed by the SBA, the local board of education, the abatement designer and abatement contractor must provide written assurances that all abatement work has been performed in accordance with all applicable codes. All AHERA required close-out documentation must be on file at the owner's office and must be made available to the SBA for review.

R. Project Close-out

1. The SBA shall be notified of the dates and time of substantial and final completion walk-through inspections by the grant recipient. An SBA representative will participate in the walk-thru and will accept or reject the contract as completed. A completed WVDE BP-13-A or when required and SBA Form 139 will be forwarded to the State Department of Education and the SBA when all punch list items have been satisfactorily addressed and the contract is complete. The local board project representative shall also submit a completed Contractor and Architect Evaluation Forms (SBA Form 124). Final payment for the contract will then be processed.
2. Provide at Project Close-out the following documentation, but not limited to:
  - (a) Confirmation of Receiving Operation and Maintenance Manuals and As-Built Drawings and Specifications
  - (b) SBA Certificate of Project Completion – For lump sum projects use “WVDE BP-13-A” and for multiple prime contract projects use “SBA 139.” Both of these forms are found in the SBA Guidelines and Procedures Handbook (Appendix L). These Forms should be filled out and signed by the local board of education then forwarded to the contractor and the architect and engineer for signing
  - (c) Contractor Evaluation Form (SBA 124) (to be completed with SBA staff)
  - (d) Architect/Engineer Evaluation form (SBA 138) (to be completed with SBA staff)
  - (e) SBA Certificate of Occupancy
  - (f) Notification of 11<sup>th</sup> month walkthrough date
  - (g) Electronic & Hard copy of diagrammatic floor plan of new or renovated schools.  
Provide the following items:
    1. One line drawing of floor plans including only diagrammatic walls, exiting, doors and windows, existing school
    2. One line drawing with all school access safety data (submit electronic file to Office of Homeland Security)

- 3. One line drawing including only walls, doors, windows, room number/names and color coded HVAC zones with multi-zone equipment located in the HVAC zone
- (h) Provide a Final TAB report
- (i) Provide Final Commissioning Report when applicable

### **III. CONTRACT DOCUMENT FORM REQUIREMENTS**

The following information shall be included in the project manual for all projects funded in whole or in part by the SBA. The SBA also requires all referenced documents to be bound within the contract documents project manual and revised or updated documents must be approved by the SBA. The SBA encourages the use of standard AIA forms when possible including but not limited to the following:

#### **A. CONTRACT DOCUMENT REQUIREMENTS**

##### **GENERAL REQUIREMENTS**

- Construction Drawings
- Project Manual
- General and Special Conditions
- Invitation to Bid
- Instructions to Bidders
- Bid Proposal Form
- Bid Bond (AIA A310)
- Insurance Requirements
- Performance Bond and Payment Bond
- Contractor's Qualification Statement (SBA 105)

#### **B. CONTRACT FORMS**

- General Conditions of the Contract for Construction (AIA A201)
- Standard Form of Agreement Between Owner and Contractor Where Basis of Payment is a Stipulated Sum (AIA A101)
- General Conditions of the Contract for Construction Manager – Adviser Edition (AIA A201/CMA)
- Standard Form of Agreement Between Owner and Contractor – Stipulated Sum, Construction Manager – Adviser Edition (AIA A101/CMA)
- General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, where applicable (AIA A232)
- Performance Bond and Payment Bond (AIA A312)
- Instructions to Bidders (AIA A701)
- Change Order (AIA G701)
- Change Order, Construction Manager – Adviser Edition, where applicable (AIA G701/CMA)
- Application and Certificate for Payment (AIA G702)

Application and Certificate for Payment, Construction Management –  
 Adviser Edition, where applicable (AIA G702/CMA)  
 Continuation Sheet (AIA G703)  
 Certificate of Substantial Completion (AIA G704)  
 Certificate of Substantial Completion, Construction Manager – Adviser  
 Edition, where applicable (AIA G704/CMA)  
 Builders Risk Insurance Certificate, where applicable (Acord Form 24)  
 Certificate of Insurance (G715) (Acord Form 25)  
 SBA Policy and Procedures  
     Part 1 – Supplemental Instructions to Bidders  
     Part 2 – Supplemental General Conditions  
 Contractor’s Affidavit of Payment of Debts and Claims (AIA G706)  
 Contractor’s Affidavit of Release of Liens (AIA G706A)  
 Consent of Surety to Final Payment (AIA G707)  
 Consent of Surety to Reduction in or Partial Release of Retainage (AIA  
 G707A)  
 Proposal Request (AIA G709)  
 Architect’s Supplemental Instructions (AIA G710)  
 Construction Change Authorization (AIA G714)  
 Construction Change Directive, Construction Manager-Adviser Edition,  
 where applicable (AIA G714/CMA)  
 Certificate for In-State Contractor Preference (if preference given)  
 Contractor’s Qualification Statement and Contractor Financial Statement  
 (SBA 105 and 105A)  
 List of Subcontractors and Major Equipment/Materials Suppliers (SBA  
 123) Verification of HVAC Training (SBA 159)  
 Certificate of Project Completion (BP-13A)  
 Certificate of Project Completion – Multiple Prime Projects (SBA 139)  
 Affidavit of Debt Paid (SBA 177)  
 Prime Contractor’s Certification of Worker Compliance with WV Code  
 and SBA Policy (SBA 181)  
 Subcontractor’s Certification of Worker Compliance with WV Code and  
 SBA Policy (SBA 182)  
 SBA Bid Checklist (SBA 183)  
 Certification of Receipt of Addenda (SBA 184)  
 State of West Virginia Purchasing Affidavit (SBA 185)  
 Monthly Anticipated Adverse Weather Delays (SBA 186)  
 School Building Authority Construction (CPM) Schedule (SBA 187)  
 Drug Free Workplace Conformance Affidavit (SBA 188)

## PROFESSIONAL SERVICES OF THE CONSTRUCTION ANALYST

The following is a description of the professional services of the Construction Analyst. The Construction Analyst (CA) will be assigned to select projects by the SBA as projects are approved. The Construction Analyst will act as the owner and SBA representative and provide services as described in the SBA/CA task order agreement .

Generally, the Construction Analyst advises the owner, SBA, and architect at the beginning of the design development phases and these services continue through the construction document phase of the project. The CA will provide constructability and document coordination review comments as they relate to the clarity of the documents and estimates of probable cost.

The Construction Analyst does not assume responsibilities for the design or methods and means for the construction of the facility and does not assume responsibilities assigned to the architect/engineer or contractors performing work on the project. However, the Construction Analyst review comments shall be incorporated in the documents by the A/E unless the A/E determines the clarification will change the design intent or conflict with applicable codes or standards. Should owner, SBA and CA clarification comments not incorporated into the documents result in a construction change order, the SBA will not provide funding for the change order.

The Construction Analyst will provide an estimate of the cost of their service at the schematic design phase of the project. The architect/engineer shall provide the Construction Analyst a copy of the schematic design document information and include all SBA submission requirements (SBA Form 176b). The CA will base the cost of services on the scope of work shown on the schematic design. The grant recipient and SBA will approve the cost of the CA services and the grant recipient will issue a purchase order for services described in the task order agreement.

The CA will then review and provide services for the design development and bidding document phase of the project. The architect, grant recipient and the SBA will work cooperatively to design the school within the funding available. The process will be as follows:

- Construction Analyst assigned to an approved project
- Architect/Engineer provides CA with schematic design for cost of services quotation
- Cost for services negotiated and grant recipient issues purchase order to the assigned CA for services (SBA will reimburse for cost of services based on the project percentage breakdown in grant contract)
- CA provides design development documents for review comments
- Grant recipient, SBA, A/E and CA review and reconcile design development comments
- A/E provides CA construction documents for review comments
- Grant recipient, SBA, A/E and CA review and reconcile construction document comments. Reconciliation is achieved when all parties agree that the estimate is within 2% of each parties estimate or agreement is reached that no further scope of work can be reasonably accomplished and additional funding will be committed to the project if the

deficit becomes a reality after the bids are received. Projects with budget differences greater than 2% may only move forward with owner and SBA approval.

- Project proceed to the bidding stage based on agreements reached by all parties regarding design and project cost

Once bids are received and a construction contract is awarded, the construction analyst contract for services on the specific project is terminated. Please review the SBA Quality and Performance Standards for additional construction analyst information and requirements.

## PROFESSIONAL SERVICES OF THE CONSTRUCTION MANAGER

The SBA will review each approved project and determine the project management team for each project. This process will be concluded when each project is approved by the Authority. The Construction Manager (CMA) shall be hired by the SBA in accordance with the procedures in Chapter 5G of the West Virginia Code. The CMA will be a professional service, assigned to projects where multiple prime contracting is required and must be in place prior to the conceptual stage of the building design. The Construction Manager ~~will~~ shall be contracted directly to the owner and represents the owner and SBA interests on the project in accordance with the SBA CMA task order agreement. The AIA Standard Form of Agreement Between the Owner and Construction Manager shall be used. The SBA may require supplemental conditions to the standard agreement and any modifications to the CMA or architects contract will be communicated to all parties prior to the execution of the contract.

Generally, the Construction Manager advises the owner and architect through all design phases with regard to site suitability, design constructability, document coordination and cost estimating. During the bidding and construction phase, the CMA provides professional services with regards to bid package configuration, construction scheduling, construction phasing and construction administration.

The Construction Manager does not assume responsibilities for the design or methods and means for the construction of the facility and does not assume responsibilities assigned to the architect/engineer or contractors performing work on the project.

The Construction Manager will provide preconstruction and construction services as per the AIA C132-2009, or latest approved edition, as well as the SBA task order agreement as negotiated for the individual project conditions indicated on SBA Form 189. The contract shall include provisions for preconstruction document review that will provide, but not limited to, constructability comments, document coordination and estimates of probable cost for all phases of the building design. Any and all documentation or comments provided by the Construction Manager relating to constructability reviews, document coordination and estimates of probable cost for all phases of the building design shall be directed to the Owner by the Construction Manager.

The architect/engineer (A/E) shall submit the design documents to the CMA, the owner and the SBA for review comments as required in SBA policy and the design contract. All CMA and owner/SBA comments must be satisfactorily addressed by the A/E to assure the project is moving forward with all parties clearly understanding the project scope and cost. All parties will work cooperatively to reconcile the estimate of probable cost. Reconciliation will have been achieved when all parties agree that the estimate is within 2% of each parties estimate or agreement is reached that no further scope of work can be reasonably accomplished and additional funding will be committed to the project if the deficit becomes a reality after bids are received. Projects with budget differences greater than 2% may only move forward with owner and SBA approval. CMA review comments relative to the **clarity of the design intent** shall be incorporated into the documents by the A/E unless the A/E determines that the clarifications will change the design intent of the project or conflict with applicable codes or standards. The A/E

will notify the owner and SBA of comments not being incorporated into the documents. However, should clarification comments not incorporated into the document result in construction change orders, the SBA will not provide funding for the change order.

## DUTIES AND RESPONSIBILITIES OF THE CLERK-OF-THE-WORKS

- a. Observe the quality and progress of the construction to determine in general that it is proceeding in accordance with the Contract Documents. Notify the Owner, Architect/Engineer and School Building Authority project representative immediately if, in the Clerk-of-the-Works opinion, work does not conform with the Contract Documents or requires special investigation by the Owner, Architect/Engineer or Contractor.
- b. Monitor the construction progress and assist in the preparation of progress reports required by the Owner or School Building Authority.
- c. Review Contract Documents with the Contractor's superintendent so as to have a complete understanding of the scope of the project.
- d. Consider the Contractor's suggestions and recommendations, evaluate them, discuss them with the Architect/Engineer, Owner and the School Building Authority's representative and assist the Architect/Engineer when applicable in making a final decision.
- e. Attend project meetings as the Owner's representative and report to the Owner in writing on the proceedings.
- f. Observe tests required by the Contract Documents. Review testing invoices, if any, to be paid by the Owner.
- g. Maintain records at the construction site or as directed by the Owner in an orderly manner in accordance with the Owner's and School Building Authority's procedures. Include correspondence where applicable, such as Contract Documents, Change Orders, Construction Change Authorizations, Architect's/Engineer's Supplemental Instructions, reports of site conferences, Shop Drawings, Product Data, Samples, supplementary drawings, color schedules, requests for payment, names and addresses of contractors, subcontractors and principal material suppliers.
- h. Keep a log book containing project progress and reports and submit reports on the progress of the Contractor's work to the Owner, and the School Building Authority's project representative. The log must contain activities related to the project, weather conditions, nature and location of work being performed. The Project Architect/Engineer will provide Observation Construction Reports documenting his site visits.
- i. When applicable, provide assistance to the Architect/Engineer upon request in reviewing Shop Drawings, Product Data and Samples.

- j. When applicable, observe the Contractor's Record Drawings at intervals appropriate to the stage of construction and notify the Owner and Architect/Engineer of any apparent failure by the Contractor to maintain up-to-date records.
- k. Review Applications for Payment submitted by the Contractor with the Architect/Engineer and assist in making recommendations for disposition.
- l. When applicable, assist the Architect/Engineer in reviewing the list of items to be completed or corrected with is submitted by the Contractor with a request for issuance of a Certificate of Substantial Completion. When applicable, assist the Architect/Engineer in reviewing the documentation and record documents to be furnished to the Owner by the Contractor at Substantial Completion, and verify that the Contractor has met the requirements of the Contract Documents for training the Owner's personnel in the operation and maintenance of all building equipment and systems.
- m. When applicable, assist the Architect/Engineer in final inspection of the work. Assist the Architect/Engineer in reviewing the documentation and record documents to be furnished to the Owner by the Contractor upon completion of the work.
- n. Assist the Owner on small projects by observing the construction and reporting progress and quality of work being performed by the Contractor. At no time shall the Clerk-of-the-Works assume responsibilities of the Architect/Engineer, Architect/Engineers representative or the Contractor in charge of the construction.
- o. Clerk-of-the-works will not be required for projects requiring Construction Managers.

## School Building Authority of West Virginia EDUCATIONAL SPECIFICATIONS

Each Local Board of Education, funded by the SBA for the construction of a new school facility or major renovation to an existing facility where educational curricular offerings will be altered, shall assign an Educational Specification (Ed. Spec.) Committee to work with the SBA to develop educational specifications for the facility.

By ~~constructing~~ developing educational specifications, the learning activities, the number, groupings and nature of the people involved, the spatial relationships between sections of the facility, the interrelationships of instructional programs with each other as well as non-instructional spaces and the major furniture/equipment needs of the new facility can be defined and more easily understood. Each Ed Spec Committee must consist of representatives from the educational profession, individuals from the community and the architectural design staff selected by the board of education. Upon completion, the Educational Specification will be provided to the Design Team for development of the building design.

When specifications are agreed upon and committed to a written document, the architect is provided the greatest opportunity to design a school that more nearly meets the needs of the educational program and facilitates the activities that will be occurring in the spaces. To that end, and to more readily value the scope of the project, it is essential that an educational specifications document accompany the schematic drawings submitted to the SBA for review prior to approval by the local board of education.\*

To be consistent and assist in understanding the issues to be included in the educational specifications, the following outline is provided but should not be considered inclusive should other issues be of concern to you and your planning committees.

### I. Introduction

A short synopsis describing the configuration of the educational structure, the projected number of students, site location, availability of site utilities, existing availability of ancillary facilities and spaces (i.e., athletic, etc.) and proposed statistics for the new construction.

### II. The Community

A brief description of the community, its history, specific cultural distinctions and maps showing geographic characteristics, attendance areas (present and proposed) and the site location.

### III. The Educational Plan

The educational plan can be subdivided into two general areas:

- A. Curriculum Plan – States the schools philosophy, educational goals and objectives of the program. This should clarify important issues and priorities for consideration in the planning of the new facility.

- B. Support Plan – Provides staffing information including teachers, instructional aides, food service personnel, counselors, custodial staff, and administrative staff including principals, assistant principals, department heads, etc.
- C. Technology Component (where applicable) – If technology is used to support the curriculum delivery, provide specific details regarding how the technology will be used for each curricular area and/or administrative area in the new school. The technology plan shall comply with state and county adopted standards.

IV. Building Space Requirements

The utilization of space is extremely important. The SBA requires a minimum 85% utilization of newly constructed schools or schools where building additions are being proposed. In order to assist in developing Section IV, Worksheet #1, which compiles data from the calculation of spaces for the new facility, must be completed and incorporated into Section IV.

The final number of allowable classrooms and the square footage for any facility that incorporates SBA funds will be determined by the SBA staff upon consideration of the program needs, building utilization rates, maximization of multi-use spaces in the design and the potential construction of the project within the allocated funds available.

In order to assure appropriate spaces and utilizations for the projected enrollment, room numbers and labels should be assigned to instructional areas on the schematic drawings and a model student schedule developed using Worksheet #2 to locate students and staff within the facility during each of the instructional periods of the day.

The following formula is to be utilized to determine the maximum number of classrooms that may be considered in each curricular area: The following example assumes a middle school math program for 300 students, a six period academic day (excludes planning periods), a maximum of 25 students, and calculated as a semester class where full credit is achievable for the class:

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**FORMULA FOR DETERMINING TEACHING STATIONS PER SUBJECT AREA\*\***

<i>Number of students Enrolled in subject</i>	<i>x</i>	<i>Number of periods per week in subject</i>		<i>= 1500</i>	
<u>(300)</u>		<u>(5)</u>		<u>          </u>	
				<i>Number of teaching</i>	<i>= 2</i>
				<i>=</i>	<i>stations for this</i>
<u>(25)</u>		<u>(30)</u>		<u>          </u>	<i>subject area</i>
<i>Maximum class size (see reference sheet)</i>	<i>x</i>	<i>Maximum number of periods per week (every period, every day)</i>		<i>= 750</i>	

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V. Space Allocations

This section describes the instructional areas (general classrooms, PE areas, tech. ed. labs, science areas, consumer and homemaking areas, special education spaces,

administrative offices, etc.). Middle/Junior and High School departmentalization, specialization of spaces, electives and scheduling are factors to be considered in determining then number of teaching stations. The maximum number of teaching stations may be determined by applying the formula provided in Section IV to each subject area. The following description of each subject area is needed and should include:

- A. Goals – What are the objectives to be accomplished in the area.
- B. Space Required – Submit the calculations from the formula in Section IV to identify the number of spaces needed in this subject area and complete Worksheet #1, attached. Teacher planning areas must be provided in building design allowing maximum use of teaching stations.
- C. Planned Activities – Include specific actions to be performed in an area such as paint, read, science experiments, audio visual presentation, telecommunications, robotics lab, multiple use areas, etc.
- D. Number of Users – Determine the number of administrators, teachers, aides and pupils to use the area at any one time.
- E. Group Usages – Identify if the area is to be used for large or small group instruction, individual student work, team teaching, multiple usage, etc.
- F. Spatial Requirements – Identify the spatial relationships of any one space to other areas of the facility whether inside or outside – near to or away from, convenient to media center (as with language arts areas), capability for combining or subdividing areas, the frequency of such adjustments and the square footage needed to do so, etc. Bubble diagrams should be used to show interrelationships of spaces.
- G. Support Facilities – Spaces that allow the area to meet its goal: shared storage areas, teacher preparation areas, student work/storage areas, conference rooms, etc.
- H. Environmental Considerations – Acoustical, Visual, Thermal, Climatic and Aesthetic considerations that enhance the practical usage of the specific space.
- I. Utility Needs – Utilities needed in the specific area including: water, electrical, toilets, 3-phase power, gas, vacuum capability, telephone, technology wiring, etc.
- J. Storage – More specific direction as to the cubic feet of storage needed in the specific area. Generally, this denotes built-in storage areas and closets.
- K. Display Areas – Chalkboards, bulletin boards, display cases (linear feet).

- L. Furniture and Equipment – Quantities and types of items to be used in each area.
- M. Technology – Specific needs of each space to accommodate the technological delivery system/network incorporated into the facility.
- N. Other – Identify any other specific information essential to each specific area including communications, security, special ventilation requirements and any county adopted design standards..

VI. Technology Plan

A technical plan for delivery of media, voice, data, graphics, text and telecommunications throughout the school includes a description of the instructional and administrative objectives, the technical structure needed to facilitate the system, the equipment needed to implement the system and the physical/design requirements for incorporating the system into the construction of the facility. The school technology delivery plan shall be based on the technology standards developed for the administration and instructional delivery in new schools. A detailed technology plan shall be developed specific to the project as a part of the educational specifications. The technology plan will identify how technology will be used and how it will support the curriculum delivery model. The plan shall be developed in conjunction with the WV Department of Education Office of Technology and shall:

- A. Identify current and proposed technology needs
- B. Establish technology integration strategies
- C. Identify ideal implementation strategies for every academic and administrative space
- D. Establish a process for tracking, servicing and updating technology equipment
- E. Identify security protocol and permissions strategies
- F. Outline staff development relating to the use of technology
- G. Identify the infrastructure needs based on the curriculum and instruction programming and match the technology with the skill sets the students are supposed to obtain from the instruction
- H. Provide the design engineer specific technology needs including backbone requirements that will allow the design of the power and support infrastructure for the schools technology equipment

The technology plan will be developed in accordance with SBA Policy and WV Department of Education Curriculum and Technology guidelines. The plan shall be submitted to the SBA for approval with design development documents. SBA funding to

support the technology infrastructure will be conditioned upon SBA approval of the technology plan.

## VII. Design Criteria and General Architectural Considerations

This section should regard the total school complex but may be specified in distinct areas or regard special concerns. Following are some suggested considerations:

- A. Health and safety
- B. Quality of building systems and components
- C. Economies to be attained – instructional, operational, maintenance
- D. Flexibility and multi-use of spaces
- E. Efficient circulation patterns
- F. Community use considerations
- G. Communication systems – may be incorporated into the Technology Plan
- H. Accessibility
- I. Building Security and School Access Safety
- J. Student Supervision

## VIII. Educational Specifications Committee Page

A signature page for members comprising the Ed. Spec. committee will be included. Names will be organized by the group each individual represents, i.e., teachers, administrators, parents, community leaders, design professional, etc.

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***\*Architects – Please be advised that an SBA review will not occur without submittal of the program of spaces and the preliminary educational specifications with schematic drawings and the final educational specification and technology plan submission with the design development submission. Continued development of the building design beyond without written approval of the SBA is at the fiscal risk of the designer and the grant recipient.***

**\*\*Bibliography:**

- A. Conrad, MJ., *A Manual for Determining the Operating Capacity of Secondary Schools*. Bureau of Educational Research and Service, OSU.
- B. Castaldi, Basil, *The Castaldi Nomogram*. The New England School Development Council.
- C. CEFPI, Phoenix, AZ, *A Guide for Planning Educational Facilities*.

**SBA Policy and Procedures**  
**APPENDIX J**

**(PART 1 – SBA SUPPLEMENTAL INSTRUCTIONS TO BIDDERS)**

**THE FOLLOWING SBA SUPPLEMENTAL CONDITIONS CHANGE, DELETE FROM OR ADD TO THE AIA A701-1997 INSTRUCTIONS TO BIDDERS AND SHALL BE INCORPORATED INTO THE PROJECT MANUAL UNDER THE INSTRUCTION TO BIDDERS. THIS DOCUMENT SHALL BE PRINTED ON NON-WHITE PAPER TO BE DISTINGUISHED FROM OTHER SPECIFICATION PAGES.**

**ARTICLE 2 – BIDDER’S REPRESENTATIONS:**

*Add the following to Article 2 Bidder’s Representation.*

*Add the following section:*

- 2.1.5** Failure to have official representation and official registration of attendance at the pre-bid meeting will disqualify contractors from bidding the project. The representative shall be an employee of the company being represented. Should it be determined that the representative is not employed by the company being represented, that company’s bid proposal shall be rejected.

**ARTICLE 3 – BIDDING DOCUMENTS:**

*Add the following to Article 3 – Bidding Documents*

**3.3 Substitutions**

- 3.3.2** Delete the first sentence and add the following: “No substitutions will be considered prior to the receipt of Bids unless a written request for approval has been received by the Architect at least twenty-one days prior to the date for receipt of Bids.

**3.4 Addenda**

- 3.4.5** Failure to submit SBA Form 184 Certification of Receipt of Addenda shall result in disqualification of the bid.

**ARTICLE 4 – BIDDING PROCEDURES:**

*Add the following to Article 4 Bidding Procedures.*

**4.1 Preparation of Bids**

- 4.1.5** *Add the following sentence:*  
If no Alternate Bid is proposed by the Bidder, write “no bid”

*Add the following section:*

- 4.1.8** All requested Bid Proposals shall be bid. If Bidder elects not to provide such Bid, write “no bid”

**4.2 Bid Security**

*Add the following section:*

- 4.2.4**

- .1 Each Bid shall be accompanied by a Bid Bond payable to the Owner for five percent (5%) of the total Bid issued by a solvent surety company with a rating of A.M. Best, A- or better rated and listed on the most current Federal Register, Circular 570, and authorized to do business in the State of West Virginia. Should the Bidder refuse to enter into a contract with the Owner on the terms stated in the Bidding Document or fail to furnish bonds covering faithful performance of the Contract and all obligations arising there under, the full amount of the Bid Security shall be forfeited to the Owner as liquidated damages, not as a penalty. No Bid Bond is required for projects of \$25,000 or less.
- .2 Irrevocable Letter of Credit is not acceptable as a Bid Bond.
- .3 A certified cashiers' check is not acceptable as a Bid Bond.
- .4 Personal securities are not acceptable as a Bid Bond.

### **4.3 Submission of Bids**

#### **4.3.1** *Delete Paragraph 4.3.1 in its entirety and replace with the following:*

Bids shall be submitted using the three envelope system. Valid bid bond, certification of receipt of addenda (SBA 184), Bid Certification Form (SBA157) and a copy of the bidder's valid WV Contractor's License, a copy of the WV Drug Free Work Place Affidavit (SBA 188) and the State of WV Purchasing Affidavit (SBA 185), shall be sealed in an opaque envelope labeled "Envelope #1". The completed and signed bid form shall be sealed in an opaque envelope labeled "Envelope #2 Bid Form". Envelopes #1 and #2 and the SBA bid checklist (SBA Form 183 ) shall be sealed inside of an opaque envelope addressed to the party receiving the bids and shall be identified with the project name, the bidder's name and address and the designated portion of the work for which the bid is submitted. If the bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "Sealed Bid Enclosed" on the face thereof. Failure to provide any the required documentation will result in disqualification of the bid being submitted.

#### **4.3.2** *Delete this section in its entirety and replace with the following:*

In accordance with WV Code Section 5-22-2 (a), the public entity accepting bids shall designate the time and place the bids will be received. No public entity may accept or take any bid, including receiving a hand delivered bid, after the time advertised to take bids.

### **4.4 Modification or Withdrawal of Bid**

*Add the following section:*

- 4.4.5** Bids may not be withdrawn for a minimum period of thirty (30) days following the date of receipt of Bids without forfeiture of bid security as liquidated damages, not as a penalty. Should the actual bid documents indicate additional time for bid withdrawal, the bid documents shall prevail.

**ARTICLE 5 – CONSIDERATION OF BIDS:**

*Add the following to Article 5 – Consideration of Bids.*

**5.2 Rejection of Bids.** Delete paragraph 5.2 in its entirety and replace with the following:

- 5.2** The Owner shall have the right to reject any or all Bids or to reject a Bid which has been deemed incomplete or irregular, in accordance with Section 5-22-2 (b) of the WV Code.

**5.3 Acceptance of Bid – (Award of Contract)**

**Revise 5.3.1** to read as follows:

It is the intent of the Owner to award a Contract to the lowest responsible Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to accept the Bid or Bids which, in his judgment, is in his own best interest.

**Revise 5.3.2** to read as follows:

The Bidder will note that Bids consist of the Base Bid and several related add or deduct Alternate items, all comprising items entering into the project and forming the contract as a whole.

These several parts of the Proposal furnish the basis of arriving at the awarding of the contract. The Owner may award the contract on the basis of the Base Bid alone, or if and when conditions warrant, accept any such Alternate items appearing on the proposal, in no prioritized order, thereby reducing or increasing the amount of the Base Bid.

**Revise 5.3.3** to read as follows:

The contract shall be deemed as having been awarded when formal notice of award has been duly served upon the intended awardee (i.e., the bidder to whom the Owner contemplates awarding the contract) by an authorized individual representing the agency receiving bids. Terms of the contract shall not be deemed to have been perfected until a satisfactory surety bond equal to 100% of the contract sum has been furnished to the owner by the successful bidder, at his own expense as a guarantee of contract performance.

Add the following:

- 5.3.4** Pursuant to the laws of the State of West Virginia, the School Building Authority of West Virginia must award bids only to the lowest qualified bidder. Therefore,

when utilizing any portion of state funds for a project, county boards of education must consider the factors in SBA Criteria for Selection of Lowest Qualified Bidders, and the information from the Contractors Qualification Statement, when making a determination as to whether a contractor's bid is not only the lowest, but the most qualified.

- 5.3.5** Any bidder adversely affected by the intended decision of the Owner to award a contract or to reject all bids shall file a notice of protest and bond with the Owner within seventy-two (72) hours after the issuance of the intent to award. A formal written protest shall be filed with the Owner with ten (10) days after filing the notice of protest with the Owner, stating with particularity the facts and law upon which the protest is based.
- 5.3.6** All notices of protest and formal protest shall be filed with the Owner.
- 5.3.7** A protest is not timely filed unless both the notice of protest and the formal protest are received by the Owner within the required time limits. A written notice of protest which is filed by 4:00 p.m. on the date on which the seventy- two (72) hours expires is timely. If such a date is Saturday, Sunday or a legal holiday, the period shall run until 4:00 p.m. of the next day that is not a Saturday, Sunday or a legal holiday.
- 5.3.8** The Owner has the sole authority to review the protest and render a decision. The Director of the County, or his/her designee, shall review the protest and issue a written decision. A hearing may be conducted at the option of the Director or assigned designee.
- 5.3.9** If the bidder is not satisfied with the Owner's decision, they may take appropriate legal action through the West Virginia court system. Any bidder who files a notice of protest with the West Virginia Court System in a bid rejection or an award pursuant to this section shall post with the Owner, at the time of filing the notice of protest, a bond payable to the Owner in an amount equal to one percent (1%) of the lowest bid submitted, or \$5,000, whichever is greater.
- 5.3.10** All protest bonds shall be made payable to the Owner and shall be signed and sealed by the protestor and surety. The bonds shall bind the protestor and surety and be conditioned upon the satisfaction of any cost and charges included in any final order of judgment of appellate proceedings, in the event that the Owner prevails. In lieu of a bond, the protestor may submit a cashier's check or bank money order made payable to the Owner, the monies shall be held in trust by the Owner.
- 5.3.11** If the protesting party prevails after completion of the protest and any appellate court proceedings, it shall be entitled to recover from the Owner all costs and charges included in the final order or judgment, excluding attorney's fees. If the Owner prevails it shall recover all costs and charges included in the final order or

judgment excluding attorney's fees. Upon payment of such costs and charges by the protestor, the bond shall be returned. The entire amount of the bond shall be forfeited if the hearing officer determines that a protest was filed for a frivolous or improper purpose including, but not limited to, the purpose of harassing, causing unnecessary delay or causing needless expense for the Owner or successful bidder.

**5.3.12** The Owner shall be considered the prevailing party if the protestor withdraws the protest at any time before the entry of the final order.

## **ARTICLE 6 – POST BID INFORMATION**

*Add the following to Article 6 Post Bid Information*

**6.1 Contractor Qualification Statement.** Delete paragraph 6.1 in its entirety and replace with the following:

- 6.1.1** A completed Contractor Qualification Statement (SBA 105) will be required of any Contractor and/or subcontractor to be submitted to the School Building Authority for review. This confidential information will be used by the SBA for evaluation of the low bid contractors on the project. Therefore, the SBA shall determine whether or not the provided information satisfies the intent of the required form. The contractor qualification statement will only be required once annually and updated documents will be required from low bid contractors once the current contractor qualification statement has expired. The Qualification Statement must be submitted 72 hours after the close of the bid opening and prior to the award of bids and will be used in the bid review process by the owner and SBA.
- 6.1.2** The confidential reviewed financial statement section of this document shall be submitted to the SBA by the lowest qualified bidder (s) within 72 hours of the close of the bid opening and prior to the execution of contracts or agreements between the local board of education and the contractor(s). Review financial statements shall not be required of any subcontractor covered by the Prime Contractor's surety. The latest available financial information must be used. Minimum requirements for financial statements provided by lowest qualified bidder are:
- a. Accountants compilation report;
  - b. Balance sheet;
  - c. Income statement;
  - d. Statement of changes in retained earnings;
  - e. Statement of cash flows; and
  - f. Notes to the financial statement.

- 6.1.3** In addition to the financial statement, the successful low bid contractor(s) shall submit a completed Affidavit of Debt Paid (SBA Form 177) to the owner and SBA within 72 hours of the close of the bid.
- 6.1.4** Construction contractors or subcontractors or equipment/material suppliers ~~whose~~ who have demonstrated a pattern of poor and/or non-compliant work performance, has been failure to comply with the construction schedule and phasing plan established in the bidding documents which has been documented by the SBA, project administrators and/or designers, or whose infractions of the State Prevailing Wage Rate codes has been documented by multiple citations from the West Virginia Department of Labor or whose contract has been terminated for just cause as described in the latest SBA approved AIA Contract Document General Conditions, will be placed on for a minimum period of one year beginning at the time of probationary status. Such contractor may be removed from probationary status pending review of their continued work history performance by the SBA at the conclusion of their probationary period.
- 6.1.5** In order to provide opportunity for any contracting, subcontracting or equipment/material firm cited for poor or non-compliant work to appreciably improve the quality of their performance prior to being placed on probation, the SBA staff will utilize the following procedure:
- a. The cited firm shall be noticed in writing of the SBA's concern, with appropriate documentation to illustrate the poor or non-compliant work, and ~~advise the firm as to the possibility of being placed on probation. Upon continued poor/non-compliant work performance,~~ the firm cited shall appear before the Executive Director of the SBA to present his reasons for failure to respond positively with improved performance after the initial notice.
  - b. Continued failure to improve poor or non-compliant performance will result in the probation. The contractor will be invited to appear at the SBA meeting to discuss the citations and justify his uninterrupted participation.
  - c. Probationary status of a firm may be revoked or continued by the SBA's Construction Committee upon review and deliberation of any SBA staff recommendation at the conclusion of the probationary period.

**6.3 Submittals:** Delete paragraph 6.3.1 thru 6.3.4 in their entirety and replace with the following:

### **6.3.1 Submittal of Subcontractors and Major Equipment and Materials Suppliers**

- .1 The bidder(s) submitting the lowest qualified bid(s) as determined by the results of the bid opening shall submit a listing of all subcontractors and all major equipment and material suppliers proposed for each major branch of work itemized and described in the contract documents for the project. This information shall be provided to the SBA office on SBA Form #123 within two

hours after the completion of the bid opening. If the apparent low bidder is not evident at the close of bidding, all prime contractors must submit the completed SBA Form 123 to the SBA office within two hours of the completion of bids if they feel under any bidding combination their bid may be considered as the low bid. Bidding contractors are required to be present at the bid opening or obtain bid results from the owner in order to determine the bid results and the apparent low bidder(s).

- .2 Each bidder is required to establish the reliability and responsibility of all subcontracts and equipment/material suppliers being proposed to perform the work. Contractors, Subcontractors and/or equipment/material suppliers on SBA Probationary Status are prohibited from bidding any SBA project for a period of at least one year from the date the contractor is notified. It is the responsibility of any contractor soliciting bids or quotes from subcontractors to verify the eligibility of all proposed subcontractors and equipment/material suppliers being proposed to perform the work. Additionally, the list of SBA probationary contractors will be provided to the owner by the SBA and this information will be communicated by the owner to the contractors, when applicable. A review of the proposed subcontractors and equipment/material suppliers shall be conducted by the Architect/Engineer, Owner and representatives of the School Building Authority. The bidder may be requested to change an unsatisfactory subcontractor or equipment/material supplier. Proposed subcontractors or equipment/material suppliers found to be unsatisfactory jointly by the Owner, Architect/Engineer or School Building Authority and the contractor, shall be changed to an acceptable subcontractor or equipment/material supplier at no additional cost to the Owner, as the contractor has full responsibility for execution of the work.
- .3 Failure to submit a list of subcontractors and major equipment and material suppliers to the SBA office as described on the SBA Form #123 within two hours after the completion of the bid shall result in disqualification of the bid.
- .4 A copy of all contractors and subcontractors licensing certificate must be submitted to the agency receiving bids for review prior to the award of construction contracts.
- .5 Prior to the award of the contract, the Architect/Engineer will make a preliminary review of the major equipment and materials lists submitted and advise the bidder through the Owner, of the acceptance thereof, and of such other actions as may be necessary in order to meet the requirements of the contract documents. Should it develop that any of the materials or equipment named in the list do not meet the requirements and intent of the specifications, the contractor shall be required to furnish to the Owner other materials or equipment acceptable and fully complying with the specifications at no change in contract price. Preliminary review and acceptance of the listing provided

shall not relieve the Contractor from furnishing equipment and materials in complete accordance with the specifications.

6. Written approval shall be obtained from the Architect/Engineer covering any substitution of equipment or materials. Substitutions are permitted in the following instances:
  - a. Failure to meet quality and intent of specification and/or
  - b. Failure of the supplier or manufacturer to meet delivery schedules or other conditions of the contract.
7. During the 72 hours immediately following the bid opening, the SBA shall review the information provided on the required SBA Form 123 to determine if the provided information satisfies the intent of the form. The Owner/SBA reserves the right to reject the proposal of any bidder who fails to furnish all required equipment and material information necessary to meet the intent of the form.
8. The SBA recommends that all ~~general~~ prime contractors receiving quotations for bids require a scope of work letter from all subcontractors be sent to the general contractor receiving the quotation at least 24 hours before submission of the bid. The letter should identify the items being quoted ~~and, most importantly,~~ the scope of work included or not included in the price quotation that will be provided and most importantly, receive confirmation from the subcontractor that they understand the requirements and constraints of the project schedule. The SBA will not allow a prime contractor or a subcontractor to change or alter the bid after the bid opening as a result of miscommunication between the general contractor and subcontractors or supplier quoting the project.
9. Each bidder acknowledges responsibilities for each of its subcontractors, thus accepts responsibility of those subcontractors ability to meet the project timelines established. Therefore, failure of the prime bidder to take all available actions with regards to requiring the subcontractor to meet the project schedule may result in disciplinary action on the prime bidder and the subcontractor by the SBA.

### **6.3.2 Bid Certification**

1. In accordance with West Virginia Code 5-22-1, Article 22, the lowest qualified responsible bidder submitting bid on SBA funded projects must certify that all provisions within this code and SBA provisions that supersede this code have or will be met prior to execution of the construction contract. Failure to comply with these provisions will result in the disqualification of the bidder.

### **6.3.3 Payroll Certification and Employment Reporting**

1. In preparation of bids, contractors are reminded that all SBA projects are subject to state laws regarding payment of prevailing wage rates as in Chapter 21 of the West Virginia Code.

**6.3.4 Taxes: (Contractor Registration Certificate and Tax Releases)**

1. Each Bidder must be registered with the West Virginia Department of Tax and Revenue prior to the time and date for Receipt of Bids in order for his Bid to be considered.
  
- .1 If any Bidder is not registered with the Tax and Revenue Department, application should be made to West Virginia Department of Tax and Revenue, Capitol Complex, Charleston, WV 25305, and complete Form 801, so that a registration number may be assigned prior to the time and date for receipt of Bids.

**6.3.6 Contractor Licensing:**

- .1 All contractors doing business in West Virginia must be licensed to perform work in the state as required by the West Virginia Contractor Licensing Act. The ACT requires but is not limited to the following:
  - a. A contractor's license number shall be included in all contracting advertisements and all fully executed and binding contracts.
  
  - b. All approved subcontractors must be licensed and a copy of their current license number must be submitted with all quotations to the general contractor. Pursuant to the ACT, general contractors are required to only accept quotations from subcontractors licensed to perform work in West Virginia. Additionally, the SBA Form 123 requires the subcontractor's name, address and license number to be submitted to the SBA office within two hours of the close of bids and a copy of all general and subcontractors licensing certificates must be submitted to the agency receiving bids for review prior to the award of construction contracts.

## SBA Criteria for Selection of Lowest Qualified Bidders AWARD OF BIDS

Pursuant to the laws of the State of West Virginia, the School Building Authority of West Virginia must award bids only to the lowest qualified bidder. Therefore, when utilizing any portion of state funds for a project, county boards of education must consider the following factors, and the information from the Contractors Qualification Statement, when making a determination as to whether a contractor's bid is not only the lowest, but the most qualified.

1. The years of experience the bidder has in the construction, renovation or building repair business.
2. The bidder's participation in a drug program that meets the objectives, applicable laws and regulations for a drug free workplace including the use of tobacco and alcohol on school properties.
3. The continuity, experience and skill of the bidder's work force and that of the bidder's designated subcontractors.
4. The bidder's performance on similar construction projects.
5. The bidder's ability to successfully complete projects within the proposed schedules and deadlines.
6. The bidder's participation in a bonafide joint apprenticeship program that is approved by the US Department of Labor, US Bureau of Apprenticeship Training and is administered in compliance with the rules and regulations of the WV Department of Labor. [See DOL 42-7-3.1(i)]
7. The bidder's history of compliance with Worker's Compensation and Unemployment Compensation laws.
8. The bidder's history of compliance with OSHA requirements.
9. The bidder's history of compliance with Federal and State Prevailing Wage as well as Fair Labor Standards and Wage Payment laws.
10. The bidder's subcontractors compliance with state regulatory agencies.
11. The bidder's history of compliance with fringe benefit contributions, i.e., health insurance and pension benefits.
12. The bidder's local hiring plan and history of compliance with the WV Jobs Act, (WV Code, Chapter 21, Article 1C) regarding use of the local labor market.
13. The bonding record of the bidder.

14. The bidder's participation as a party in any legal action where an awarded liability could negatively impact the ability of the bidder to complete this project.
15. The bidder's financial stability and its impact on the company's ability to complete the project.
16. The bidder can demonstrate it is not in default on a debt to the State or its political subdivision in aggregate more than \$1,000.
17. The bidder's history of change order requests.
18. Response from bidder's references and recommendations of other owners for whom the bidder has worked.

All of the above factors, as supported by the accompanying Contractors\_Qualification Statement, will be considered by the county board of education in determining the "best" most qualified bid. No single criteria will be considered the controlling factor in determining whether a bid is, or is not the "best" bid.

awardofbids  
Revised 4/2014

**SBA Policy and Procedures**  
**APPENDIX J**

**(PART 2 –SUPPLEMENTAL GENERAL CONDITIONS)**

**THE FOLLOWING SBA SUPPLEMENTAL CONDITIONS CHANGE, DELETE FROM OR ADD TO THE “GENERAL CONDITIONS” OF THE CONTRACT AIA DOCUMENT A201 AND SHALL BE INCORPORATED INTO THE PROJECT MANUAL. THIS DOCUMENT SHALL BE PRINTED ON NON-WHITE PAPER TO BE DISTINGUISHED FROM OTHER SPECIFICATION PAGES.**

## **ARTICLE 1 – GENERAL PROVISIONS**

### **1.1 Basic Definitions**

#### **1.1.1 The Contract Documents**

*Delete the last sentence and add the following:*

The Contract Documents also include Bidding Requirements, (Advertisement to Bid, Instructions to Bidders, Supplemental Instructions to Bidders, sample forms, and the portions of the addenda relating to bidding requirements), the Contractor’s Bid, Bid Bond, Contractor’s Qualification Statement, List of Subcontractors, Equipment/Material Suppliers, and other documents listed in the Agreement.

*Add the following Section:*

#### **1.1.9 Litigation**

Litigation refers to a civil action instituted in the Circuit Court in the County in which the Project is located.

## **ARTICLE 3 – CONTRACTOR**

### **3.7 Permits, Fees, Notices and Compliances with Laws**

*Add the following Section:*

**3.7.6** For the Owner’s records, Contractor shall submit copies of permits, licenses, certifications, inspection reports, releases, notices, receipt for fee payments, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

### **3.9 Superintendent**

*Add the following Section:*

**3.9.4** The General Trades Contractor’s on site project Superintendent is to provide full-time project supervision and is not to perform work with tools.

### **3.10 Contractor’s Construction Schedules**

*Delete Section 3.10.1 in its entirety and substitute the following:*

**3.10.1** The Contractor, prior to submission of the second pay application, shall prepare and submit for the owner’s and architect’s information, a contractor’s construction schedule for the work in accordance with the requirements of SBA Form 187. The schedule shall not exceed the time limits as defined in the contract documents and shall update or revise every 30 days. Thereafter, all Prime Contractors shall review and provide written approval of the construction

schedule and each subsequent revision thereof. The schedule shall be related to the entire project to the extent required by the contract documents, and shall provide for expeditions and practicable execution of the work.

### **3.18 Indemnification**

*Delete Section 3.18.1 in its entirety and substitute the following:*

**3.18.1** The Contractor agrees to indemnify and hold harmless the Owner, the Architect, the Architect's consultants, and the officers, principals, shareholders, agents and employees, of any of them from and against all claims, demands, actions, causes of action, damages, losses, fines, civil penalties, and expenses, including but not limited to attorney's fees, arising or resulting (or alleged to arise or result), in whole or in part, from the performance of the Work or from any act or omission of the Contractor, a Subcontractor, a Sub-subcontractor, or any other person furnishing labor, services, materials or equipment with respect to the Work as well as anyone employed directly or indirectly by them or anyone for whose acts or omissions they may be liable, regardless of whether such claim, demand, action, cause of action, damage, loss, fine, civil penalty or expense may have or is alleged to have arisen or resulted from an act or omission of any party indemnified hereunder; provided, however, Contractor's obligations hereunder shall not be construed to apply to any claim, demand, action, cause of action, damage, loss, fine, civil penalty or expense arising solely from the negligence of any person indemnified hereunder. Contractor's indemnity obligation set forth above shall extend to the claim of any employee of the Contractor, of a Subcontractor, a Sub-subcontractor, or any other person furnishing labor, services, materials, or equipment with respect to the Work, of anyone employed directly or indirectly by them or of anyone for whose acts they may be liable. Contractor's indemnity obligations shall survive termination of this Agreement.

*Delete Section 3.18.2 in its entirety and substitute the following:*

**3.18.2** In claims against any person or entity indemnified under this Section 3.18 made by an employee of the Contractor, a Subcontractor, a Sub-subcontractor, or any other person furnishing labor, services, materials, or equipment with respect to the Work, or anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this section 3.18 shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers compensation acts, disability benefit acts or other employee benefit acts.

## **ARTICLE 4 – ADMINISTRATION OF THE CONTRACT**

### **4.2 Administration of the Contract**

*Revise the first sentence of Section 4.2.2 to read as follows:*

**4.2.2** The project Architect/Engineer responsible for the design of the facility shall attend a minimum of one (1) construction progress meeting each month, to become generally familiar with the progress and quality of the portion of the work completed, to aide and assist with questions or issues that have arisen during construction, and to determine, in general, if the work observed is being performed in a manner indicating that the work, when fully completed, will be in accordance with the contract documents. This person must have authority to render decisions on the project in order to avoid unnecessary delays.

*Delete Section 4.2.4 in its entirety and substitute the following:*

**4.2.4** Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall communicate through the Architect. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors, Sub-subcontractors and material suppliers shall be through the Contractor. Communications by and with separate Contractors shall be through the Owner.

*Add the following Section:*

**4.2.15** The School Building Authority (SBA) of West Virginia reserves the right to visit projects at intervals deemed necessary to observe the progress of construction. The SBA field representative shall have such responsibilities as the SBA may delegate.

## **ARTICLE 6 – CONSTRUCTION BY OWNER OR BY OTHER CONTRACTORS (Only Applicable in Multiple Prime Contractor Situations)**

### **6.1 Owner's Right to Perform Construction and To Award Separate Contracts**

*Delete Sections 6.1.1. through 6.1.3. in their entirety and add the following Sections:*

**6.1.1. Multiple Prime Contracts.** The Contractor acknowledges that the Owner will contract with other Prime Contractors for other parts of the Project under conditions of the Contract identical or substantially similar to these. The term Contractor in the Contract documents shall in each case mean the Contractor who executes each separate Owner-Contractor Agreement. In preparing its Bid, the Contractor has carefully reviewed those documents made available to it by the Owner or Architect relating to the scheduling and nature of other contracts which may be awarded and has submitted a proposal which takes into account the need to coordinate its Work with that of other Prime Contractors. The Contractor further agrees that time is of the essence in completion of the Work and that the Work will be completed promptly and according to the Project Schedule. It is the express obligation and duty of the Contractor under this Contract to coordinate its Work with the Work of other Prime Contractors to achieve such completion.

**6.1.2. Contractor's Duty to Coordinate.** The Contractor shall not impede, hinder or delay any other Prime Contractor in the performance of its work. It is the

Contractor's duty to communicate with any other Prime Contractor who will be performing work which may connect, compliment, interfere with or otherwise be dependent upon the Contractor's Work and to resolve any disputes or scheduling or coordination issues with such other Prime Contractor. All Prime Contractors are responsible, jointly and severally, for coordinating their various sections of work as to scheduling, installation procedures, Shop Drawings and installation of related materials. Provided that the Contractor does not thereby assume responsibility for acts or omissions of the other contractors, if required to do so by the Construction Manager, the Contractor shall review the actual progress of other Prime Contractors work on a monthly basis and advise the Owner as to whether the Request for Payment submitted by any other Prime Contractor is in accordance with the actual progress of the corresponding work.

- 6.1.3. Owner's Coordination Duties.** Neither the Owner nor the Architect has any obligation express or implied to coordinate or schedule the Work of Contractor with that of other Prime Contractors.
- 6.1.4. Third Party-Beneficiary.** Each other Prime Contractor has a right to performance of Contractor's obligations under this Article 6. Contractor agrees that such other Prime Contractors are third-party beneficiaries of its obligations under this Article 6 and that Contractor will be a third-party beneficiary of all other Prime Contractors' obligations under the same provisions appearing in their respective Contract Documents.
- 6.1.5. Contractors' Liability to Each Other.** In the event that any other Prime Contractor performing work should hinder, delay or damage the Contractor's Work or should otherwise cause loss (including acceleration costs) or injury to the Contractor, Contractor agrees that it shall look solely to such other Prime Contractor for relief therefore. Neither the Owner nor the Architect shall be responsible for any such hindrance, delay, damage, loss, or injury, and the Contractor will, in no event, attempt to hold the Owner or Architect liable for the costs thereof. The Contractor shall not make: (a) any claim for adjustment of Contract Sum or Contract Time, equitable or otherwise, against the Owner based on any of the foregoing; (b) a claim of any type against the Architect arising from such hindrance, delay, damage, loss or injury. Similarly, the Contractor agrees that it will be legally responsible to any other Prime Contractor performing work related to the Project and will indemnify the Owner and Architect against any claim, suit loss, injury, damage or delay including, but not limited to, acceleration costs incurred as a result of delay, caused, in whole or part, by the Contractor. The Contractor and its Performance Bond surety shall indemnify and hold harmless the Owner, and the Architect from and against any claim brought against any of them by another Prime Contractor including costs, expenses and attorneys' fees incurred by any of them as a result of the Contractors alleged acts or omissions.

## **6.2 Mutual Responsibility**

*Delete Section 6.2.3 in its entirety.*

## **ARTICLE 8 – TIME**

*Add the following Section:*

### **8.4 Acceleration**

- .1 If the Contractor is behind the construction schedule to such an extent that the Owner or Architect reasonably determines that the Contractor will be unable to meet any milestone completion date established by the Contract Documents or to substantially complete the Work in the Contract Time, the Owner may direct the Contractor to accelerate its work. Such acceleration may include employing such additional forces or paying such additional overtime wages as may be required to place the progress of the Work to allow contractor to meet future milestone completion dates and achieve substantial completion within the Contract Time. Such acceleration shall be accomplished at the Contractor's own cost. Contractor shall also pay any additional sums which may become due to the Architect as a result of such acceleration. If the Contractor voluntarily accelerates its work to maintain the construction schedule, it shall likewise do so at its own cost. Under Multiple Prime Contracts if the cause of Contractor being behind schedule is another Prime Contractor(s)'s failure to fulfill its obligations under Article 6, Contractor shall make its claim for acceleration costs solely against such Prime Contractor(s) and not against the Owner or Architect.

## **ARTICLE 9 – PAYMENTS AND COMPLETION**

*Add the following to Article 9 Payments and Completion.*

**9.2 Schedule of Values.** *Delete this Section in its' entirety and replace with the following:*

- 9.2.1** Provide a complete, itemized breakdown of the "Schedule of Values" for the work of this Contract. This "Schedule of Values" must be submitted by each prime Contractor prior to the first Application for Payment by the Contractor, and approved by Architect, County and SBA, prior to the first payment. Unless otherwise required, each line item must include its allocable share of the Contractor's overhead and profit. The Prime Contractor is to follow the following guidelines in development of the "Schedule of Values":
  - a) The "Schedule of Value" shall be prepared in such detail and must be supported by such data to substantiate its accuracy as required by Architect, County and SBA.
  - b) The "Schedule of Values" shall be broken down by Specification Section, then Phase, Section and/or Floor, then product, then Material & Labor, as appropriate for the Project, and as required by Architect, County and SBA. See the below example.

- c) The “Schedule of Values” shall be broken down in such detail where no single activity exceeds \$100,000. In the event a single activity exceeds \$100,000 (i.e. – equipment, pre-assembled unit, etc.) the Contractor must notify the Architect in writing and obtain approval from the Architect, County and SBA.
- d) The “Schedule of Values” shall utilize action words for description of an activity, i.e. install, place, rough-in, etc.
- e) The “Schedule of Values” shall provide a breakdown for labor, material and equipment, as appropriate and as required Architect, County and SBA.

Section 0000 1

Phase/Section/Area/Floor “A”

- Product X
  - Material Cost
  - Labor Cost
- Product Y
  - Material Cost
  - Labor Cost

Phase/Section/Area/Floor “B”

- Product X
  - Material Cost
  - Labor Cost
- Product Y
  - Material Cost
  - Labor Cost

Section 0000 2

Phase/Section/Area/Floor “A”

- Product S
  - Material Cost
  - Labor Cost

Section 0000 3

Etc.

**9.2.2** At the Owner’s discretion, and approved in advance in writing, the Contractor may invoice for off-site stored materials. The off-site stored materials must be verified by a representative of the County prior the approval for payment. All off-site stored material for which payment is being sought shall be scheduled for three (3) months prior to installation. Off-site stored materials shall be stored within the State of West Virginia, unless otherwise approved. Also, the Contractors must provide the Owner with a proof of cost (i.e.– sales receipt) and certificate of

insurance from an approved insurance carrier for the value of full replacement of materials stored off-site; also naming the County and SBA as additionally insured.

**9.3 Applications for Payment.** *Add the following:*

**9.3.1.3** A 5% retainage will be maintained throughout the construction period. The Owner will pay 95% of the portion of the Contract Sum properly allocable to labor, material and equipment incorporated in the work, and of materials and equipment suitably stored at the site or at some other location agreed upon in writing, for the period covered by the most current submitted Application for Payment, less the aggregate of previous payments.

*Add the following Section:*

**9.3.4** The School Building Authority (SBA) of West Virginia reserves the right to review all contractors' applications for payment and request additional documentation to substantiate the request and in cooperation with the Owner make adjustments as deemed appropriate.

*Add the following Section:*

**9.3.5** Applications for payments from the SBA must be accompanied by an SBA Exhibit B Requisition Form, SBA 104A and a copy of the invoice and a description of work completed including materials/equipment used for the project. Requisitions must be received by the depository and the SBA by the 5<sup>th</sup> day of the month in which payment is being requested. Payments will be processed and mailed to the grant recipient on the 15<sup>th</sup> day of the same month. The SBA reserves the right to review requests for payment and make adjustments when they deem necessary. **Note: An approved construction schedule must be in place prior to the second pay application being requested. All Prime Contractors shall review and provide written approval of construction schedule and each subsequent revision thereof. Failure to comply with this provision will result in delayed processing of this and all future pay applications until the owner and SBA approved schedule is in place.**

**9.8.5 Substantial Completion**

In the second sentence, change the phrase "make payment of retainage" to read "make partial payment of retainage."

*Add the following to the end of Section 9.8.5*

The Owner will pay upon Substantial Completion of the Contracted Work, a sum sufficient to increase the total payments to 95% of the Contract Sum, less such amounts as the Architect and the Owner shall determine for all incomplete work, rejected work and unsettled claims as provided in the contract documents. The final 5% retainage shall not be released until the Grant Recipient, Architect/Engineer and the School Building Authority have received satisfactory evidence of the completion of all work required by the contract documents, including all rejected work and the resolution of all unsettled claims.

*Add the following Section:*

## **9.10 Final Completion and Final Payment**

### **9.10.2**

- .1 A State tax release form will be filed with the West Virginia Department of Tax and Revenue by the local board of education upon receipt of the final payment request from the contractor. Final payment will only be processed after the local board of education has received evidence from the Department of Tax and Revenue indicating appropriate state taxes has been paid on completed construction projects in West Virginia.
- .2 Affidavit of Debt Paid – In accordance with West Virginia Code 5A-3-10a, contractors are required to submit an Affidavit of Debt Paid SBA Form 177. This form shall be submitted to the county board of education or contracting agency along with other closeout documents.
- .3 Should the Architect determine during the final inspection that the remaining work is not completed in accordance with the terms and conditions of the contract documents, the Contractor shall be responsible for all costs associated with the Architect's return visits. Costs shall include, but are not limited to, hourly wage, mileage reimbursement, accommodations, and miscellaneous reimbursables.**

*Add the following Section:*

## **9.11 Liquidated Damages**

- 9.11.1** It is acknowledged that the Contractor's failure to achieve substantial completion of the Work within the Contract Time provided by the Contract Documents will cause the Owner to incur substantial economic damages and losses of types and in amounts which are impossible to compute and ascertain with certainty as a basis for recovery by the Owner of actual damages, and that liquidated damages represent a fair, reasonable and appropriate estimate thereof. Accordingly, in lieu of actual damages for such delay, the Contractor agrees that liquidated damages may be assessed and recovered by the Owner as against Contractor and its Surety, in the event of delayed completion and without the Owner being required to present any evidence of the amount or character of actual damages sustained by reason thereof; therefore Contractor shall be liable to the owner for payment of liquidated damages in the amount indicated below for each day (Sundays and Holidays included) that Substantial Completion is delayed beyond the Contract Time as adjusted for time extensions provided by the Contract Documents. Such liquidated damages are intended to represent estimated actual damages and are

not intended as a penalty, and Contractor shall pay them to Owner without limiting Owner's right to terminate this agreement for default as provided elsewhere herein.

Liquidated damages will be assessed as follows:

<u>Project Cost</u>	<u>Liquidated Damage</u>
Up to \$1,000,000	\$750.00/per day
\$1,000,000 to \$5,000,000	\$1,000.00/per day
Over \$5,000,000	\$2,000.00/per day

## **ARTICLE 11 – INSURANCE AND BONDS**

### **11.3 Property Insurance**

*Add the following Section:*

#### **11.3.11**

- .1 The General Contractor for Multiple Prime Contracts is responsible for providing Builder's Risk Insurance meeting the requirements of this Section 11.3 for all Prime Contractors. See Section 11.5.1 for values and named insured. Payment of deductibles shall be the responsibility of the Prime Contractors' prorated by percentage among the claimants based on value of claim. General Contractor shall act as the fiduciary for distribution of insurance proceeds to the insured in the manner described in Section 11.3.8.
- .2 The Single Prime Contractor (Including Site Prep) is responsible for providing Builder's Risk Insurance meeting the requirements of this Section 11.3. See Section 11.5.1 for values and named insured. Payment of deductibles shall be the responsibility of the Contractor. Contractor shall act as the fiduciary for distribution of insurance proceeds to the insured in the manner described in Section 11.3.8.

### **11.4 Performance Bond and Payment Bond**

*Add the following Section:*

#### **11.4.3**

- .1 The contractor to whom any contract is awarded, shall pay for, execute and deliver to the Owner via the Architect, within ten (10) days after award of contract by Owner and before signing the contract a corporate surety Performance and Labor and Material Payment Bond on AIA Document A311 (or equivalent form), to be executed by an A.M. Best, A- or better rated surety company listed on the most current Federal Register, Circular 570, and which is authorized to do business in the State of West Virginia and which is satisfactory to and approved by the Owner and the SBA in the sum of one hundred percent (100%) of the amount of the contract, insuring the full and faithful performance of the work and payment in full for all materials, machinery, equipment and labor, and covering all the guarantees called for in the specifications and all other obligations arising there under. The Labor and Material Payment Bond shall be in the sum of one hundred percent (100%) of the contract amount. All contractors performing work on SBA projects must

be covered by a performance bond and must be included on the list of subcontractors submitted to the SBA (Form 123). The Owner will not accept responsibility for direct payments to subcontractors performing work on projects by way of consignment. No Performance Bond is required for projects of \$25,000 or less.

- .2 Should the successful Bidder fail or refuse to deliver the required bond and all other Contract Documents, properly executed within ten (10) days after receipt of the Owner's letter of intent to award a Contract, the successful Bidder shall forfeit the security deposited with his Bid as liquidated damages, not as a penalty.
- .3 Irrevocable Letter of Credit is not acceptable as a Performance Bond.
- .4 A certified cashiers' check is not acceptable as a Performance Bond.
- .5 Personal securities are not acceptable as a Performance Bond.
- .6 Failure of a construction firm or its subcontractor to satisfactorily perform the work specified in the contract documents will result in the owner executing their rights, pursuant to the conditions of the contract documents, to declare a construction contract default under the provisions of the AIA General Conditions of the Contract for Construction established for this project. If the construction firm's surety company is notified of their responsibility for the completion or remediation of incomplete or non-compliant work, said firm will no longer be eligible to bid future projects funded by the School Building Authority of West Virginia.

*Add the following Section:*

**11.4.4** Workers Compensation Coverage shall be provided on the project by all Contractors. Proof of continued Workers Compensation coverage throughout the duration of the project shall be provided on the certificate of coverage.

*Add the following Section:*

## **11.5 Insurance**

**11.5.1** In furtherance of Article 11 of General Conditions, each contractor furnishing labor and materials shall provide insurance in the following categories and for the stated minimum amounts. All insurance shall be written to show evidence of the following: The Architect and the Owner shall be **ADDITIONALLY INSURED** on the contractor's policy. The Contractor shall be the **NAMED INSURED**.

### **Part One - Worker's Compensation**

Contractors shall purchase and maintain workers' compensation insurance from a licensed carrier authorized to provide such coverage in the State of West Virginia.

**Part Two - Employer's Liability – Limits Required:**

\$1,000,000 – bodily injury by accident/each accident

\$1,000,000 – bodily injury by disease/per policy

\$1,000,000 – bodily injury disease/each employee

Coverage must include broad form employer's liability and a waiver of subrogation from workers' compensation carrier.

**Contractor's Public Liability Insurance - Limits Required:**

\$2,000,000 – General Aggregate

\$1,000,000 – Products Complete Operations Aggregate

\$1,000,000 – Personal & Advertising Injury Limit

\$1,000,000 – Each Occurrence Limit

**Commercial General Liability must include:**

Explosion, Collapse and Underground Property Damage. Coverage required if contractor's operations warrant such coverage.

If blasting operations, separate blasting coverage is required.

Contractual Liability Coverage covering claims involving Contractor's contractual liability including Contractor's indemnity obligations set forth in Section 3.18

**Automobile Liability Insurance**

Limits Required:

\$1,000,000 – Per Accident

Provide "Any Auto" Coverage

**Excess Liability Insurance**

Limits Required:

\$2,000,000 – Combined Single Limit Occurrence

\$2,000,000 – Aggregate

**Builders Risk and Property Insurance**

100% Completed Value Form (refer to Division 1 Section "Allowances" for Multiple Prime Contracts)

Coverage Format:

All Risk including flood, earthquake and theft

Coverage shall include transit and off-site storage/secondary location limit amount that exceeds any shipment or off-site storage material value before payments to contractor for off-site stored materials are approved. Proof of coverage limits exceeding accumulated value of materials stored is required.

**Name Insured shall be Owner, Contractor, and all Subcontractors ATIMA.**

Single Prime Contractor (Including Site Prep) is responsible for providing Builder's Risk Insurance. Deductibles shall be stated in the Certificate of Insurance. Payment of Deductibles shall be the responsibility of the Contractor.

The General Contractor for Multiple Prime Contracts is responsible for providing Builder's Risk Insurance for all Prime Contractors. Deductibles are to be a maximum of \$2500 per occurrence and shall be stated in the Certificate of Insurance. Payment of deductibles shall be the responsibility of the Prime Contractors' prorated by percentage among the claimants based upon value of claim.

Names Insured shall be Owner, CM or CA, Architect, Contractor and all Subcontractors ATIMA.

Deductibles shall be stated in the Certificate of Insurance. Payment of deductible shall be the responsibility of the contractor.

The Owner will provide Builders Risk and Property Insurance coverage for renovation projects during construction by adding the contractor and all subcontractors, ATIMA to the permanent property policy unless otherwise stated in the bidding documents.

#### **Certificate of Insurance**

The Certificate of Insurance and copy of endorsement of the policy stating that the Owner and Architect are additionally insured shall be provided by the Contractor to the Owner and Architect at the current address of said parties with a transmittal cover indicating the project name, location of project, type of work to be performed and the nature of the documents transmitted.

The Certificate of Insurance shall contain a provision that coverage afforded will not be canceled until at least thirty (30) days prior written notice has been given to the Owner and Architect.

The Owner shall be the Certificate Holder.

The Certificate shall be prepared on "Acord" Form 25-5 (7/90) or an equivalent form.

The Certificate shall indicate that the Owner, Construction Analyst or Construction Manager and Architect are ADDITIONAL INSUREDS under the Contractor's policy.

The Certificate of Insurance shall indicate the carrier's financial rating. The rating must be an A.M. Best, A- or better rated surety company listed on the most current Federal Register, Circular 570 and is authorized to do business in the State of West Virginia and approved by the owner and the SBA.

## **ARTICLE 15 – CLAIMS AND DISPUTES**

### **15.1.5 Claims for Additional Time**

*Add the following to Section 15.1.5.2:*

**15.1.5.2.1** Contractor shall supply climatological data from either an onsite weather station or from a National Oceanic and Atmospheric Administration (NOAA) or other approved nearby weather reporting station, to substantiate any claim for lost days due to weather. All documentation, including SBA Form 186, shall be submitted to the Architect prior to the 15<sup>th</sup> day of the month following the proposed claim for review and consideration. Failure to submit these claims monthly basis shall result in forfeiture of the claim.

15.1.5.2.2 Weather delays shall be substantiation for a cost increase claim for site supervision labor and general site operations costs including direct rental costs (i.e. construction trailer, toilet facilities, fencing, dumpsters). Overhead and profit shall not be applied to the rental costs.

15.1.5.2.3 Claims for days lost due to weather delays, on days which have historically been non-work days on the project (i.e. weekends, holidays, and Fridays when four day work weeks are implemented), shall not be granted, unless work has occurred on these days for two consecutive work weeks immediately prior to the days being claimed.

## **ARTICLE 16 – SPECIAL CONDITIONS**

*Add the following Article 16 Special Conditions as follows:*

**16.1** All contractors and subcontractors shall pay West Virginia Department of Labor fair minimum rate of wages for the county in which the work of this contract is performed. The SBA requires that a certified payroll be submitted with each contractor's pay-application using the U.S. Department of Labor Form WH-347 or other SBA approved document. Certified payrolls must include names, addresses and social security numbers of all workers, including those of any subcontractors, in order to assure compliance with West Virginia's Prevailing Wage laws and the SBA's Supplemental, General and Special Conditions. Upon request, counties will be required to submit the certified payroll report to the SBA for review. Each contractor shall be responsible to obtain correct and fair minimum rate of wages as established by the West Virginia Department of Labor.

**16.2** For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, notices, receipt for fee payments, correspondence and records

established in conjunction with compliance with standards and regulations bearing upon performance of the work.

### **16.3 Compliance with Codes and Governmental Requirements**

**16.3.2** All work, labor, materials and equipment specified, constructed and installed are to be of first-class quality. To help insure this occurs, all work and equipment designed and specified shall conform to the latest applicable codes and standards including but not limited to the following:

- a. West Virginia State Building Code
- b. American Society for Testing Materials (ASTM)
- c. American National Standards Institute (ANSI) to the extent adopted by authorities having jurisdiction at the job site.
- d. West Virginia State Fire Code
- e. National Electrical Code (NEC)
- f. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)

**16.3.3** All work must also have the approval of all West Virginia governmental authorities and agencies having jurisdiction over the project including but not limited to the following:

- a. West Virginia State Fire Marshal
- b. West Virginia Department of Health
- c. West Virginia Department of Natural Resources
- d. West Virginia Department of Highways
- e. West Virginia Department of Education
- f. West Virginia Division of Labor
- g. School Building Authority of West Virginia
- h. West Virginia Division of Environmental Protection

### **16.4 Payroll Certification and Employment Reporting**

**16.4.1** All contractors and subcontractors shall pay West Virginia Department of Labor fair minimum rate of wages as established in Section 21-5A of the WV Code, for the county in which the work of this contract is performed. The term “fair minimum rate of wages” shall be set forth in 21-5A-3 of the West Virginia Code. The SBA’s requirement for submission of certified payrolls, supersedes the requirements of current state law. The SBA requires that a certified payroll be submitted with each contractor’s pay application using U.S. Department of Labor Form WH-347 (formerly DOL 184). Contractors may provide this information in an alternative format provided all required information on the WH-347 is included on the alternative document. Each certified payroll must include names, addresses and social security numbers of all workers, including those of any subcontractors, in order to assure compliance with West Virginia’s prevailing

wage laws and the SBA's Supplemental, General and Special Conditions. Upon request, counties will be required to submit the certified payroll report to the SBA for review.

- 16.4.2** All contractors and subcontractors must comply with the “West Virginia Jobs Act” requirements found in Chapter 21, Article 1C of the West Virginia Code and all Department of Labor regulations.
- 16.4.3** County school boards and other grant recipients shall require all contractors and service providers to verify the criminal records of their employees before granting access to the construction site. All prime contractors and their subcontractors that will be present on the construction site or other board property shall provide the County Board or other grant recipient (owner) assurances of compliance with pertinent WV Code and SBA Policy by verifying the eligibility of all workers by providing a completed SBA Forms 181 and 182 to the County Board of Education or other grant recipient (owner). These forms shall be submitted along with the contract for construction and the contract will not be fully executed until this provision has been satisfied.
- 16.4.4** The successful low bid prime contractor and all subcontractors performing work on the project shall verify the legal status of all workers and shall comply with the latest West Virginia Code chapter 21 article 1B. All prime contractors and their subcontractors shall provide assurances to the county boards of education or other grant recipients (owner) by submitting a completed SBA Form 181. This document acknowledges the prime contractor has received assurances from subcontractors (SBA Form 182) that they are in compliance with applicable WV Code and SBA Policy. Contractors shall maintain records verifying the legal status of workers and shall, upon request by the Commissioner of Labor, surrender all employee records, including all records relating to the payment of State and Federal taxes, for verification of their legal status. If upon examination of records, the Commissioner determines that a contractor is in violation of the provisions of this code, the Commissioner may enter and order that imposes disciplinary action as provided for in article 21-1B- 1 thru 7 of the West Virginia Code.
- 16.4.5** Provide at Project Close-out the following documentation, but not limited to:
- a. Contractor's Affidavit of Payment of Debts and Claims (AIA G706)
  - b. Contractor's Affidavit of Release of Liens (AIA G706A)
  - c. Consent of Surety Company to Final Payment (AIA G707)
  - d. Certificate of Insurance (Acord Form and AIA G715) Covering required/specified products and completed operation
  - e. Certificate of Release from the Department of Tax and Revenue stating all appropriate taxes have been paid
  - f. Verification from the Owner (county superintendent) that all Owner training required by the contract documents has been conducted (SBA 159)
  - g. Fire Marshall's Certificate of Occupancy

- h. Affidavit of Debt Paid (SBA 177)
- i. Prepare quality training videos

## **16.5 SBA Project Observation**

- 16.5.1** The School Building Authority reserves the right to visit projects at intervals deemed necessary to observe the progress of the construction. The SBA field representative shall have such responsibilities as the SBA may delegate.
- 16.5.2** The School Building Authority reserves the right to review all Contractors Applications for Payment and request additional documentation to substantiate the request and in cooperation with the owner make adjustments as deemed appropriate.
- 16.5.3** The responsible contractor shall notify the SBA office two weeks in advance of:
- .1 The Testing, Adjusting & Balancing of the HVAC system.
  - .2 The training of the county maintenance and custodial personnel on new building components.
  - .3 The scheduled punch list walk-thru of the new or renovated school.
- 16.5.2** County boards of education, before accepting the HVAC contractor's work, shall receive complete training regarding the operation and maintenance of the mechanical equipment and building controls. Training shall be completed prior to occupying the building. There shall also be a one (1) day follow-up training in six months or during the succeeding heating/cooling season after the facility has been occupied to insure training on both heating and cooling operations of the system. Where specified, the installation contractor shall provide two-year maintenance and operations for HVAC equipment and other components as described in the bidding documents. The State Department of Education's HVAC Technicians shall be notified of the date and location of any and all training sessions in order to assure its ability to fulfill their responsibilities as delineated in WV Code 18-9E-3(F) & (G). At the conclusion of the training, the grant recipient shall submit the verification of HVAC Training Form (SBA Form 159) to the SBA office.

**SBA FORM 189**

**CONTRACT SERVICES RESPONSIBILITIES**  
**SUMMARY**

**For County, Architect, and Construction Manager**

School Building Authority of West Virginia  
**CONTRACT SERVICES RESPONSIBILITIES**  
 For Owner, Architect, and Construction Manager

	<u>SERVICE TASKS</u>	<u>COUNTY</u>	<u>ARCHITECT</u>	<u>CONSTRUCTION MANAGER</u>
-	<u>SITE EVALUATION / SELECTION</u>	-	-	-
1	<u>Archeological Survey Services (WV Dept of Culture &amp; History)</u>	<u>request &amp; PO</u>	<u>assists</u>	<u>assists</u>
2	<u>Geotechnical Survey Services</u>	<u>request &amp; PO</u>	<u>provide building layout</u>	<u>RFP, review and comment</u>
3	<u>Boundary Survey Services</u>	<u>request &amp; PO</u>	<u>assist</u>	<u>RFP, review and comment</u>
4	<u>Topographical Survey Services</u>	<u>request &amp; PO</u>	<u>assist</u>	<u>RFP, review and comment</u>
5	<u>Utility Survey Services</u>	<u>participants</u>	<u>originate, coordinate</u>	<u>review and comment</u>
6	<u>Site Accessibility Study (including DOH Review)</u>	<u>participants</u>	<u>originate, coordinate</u>	<u>review and comment</u>
7	<u>Property Acquisition</u>	<u>acquires</u>	<u>recommends for program</u>	<u>recommends for cost</u>
-	<u>PLANNING</u>	-	-	-
8	<u>SBA CEFP Amendments</u>	<u>reviews &amp; approves</u>	<u>originates</u>	<u>assist</u>
9	<u>SD, DD &amp; CD Design Schedule (Coordinate with SBA)</u>	<u>reviews &amp; approves</u>	<u>reviews, comments</u>	<u>originates &amp; updates</u>
10	<u>Master Project Schedule</u>	<u>reviews &amp; approves</u>	<u>reviews, comments</u>	<u>originates &amp; updates</u>
11	<u>Verify Existing Building Layout &amp; Dimensions</u>	<u>assists</u>	<u>originates</u>	<u>assists</u>
12	<u>Project Budget / Building Cost Assessment</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; implements</u>	<u>originates &amp; updates</u>
13	<u>Monthly Project Reports</u>	<u>reviews &amp; approves</u>	<u>review</u>	<u>originates</u>
14	<u>Monthly Team Meetings</u>	<u>participants</u>	<u>participants</u>	<u>conducts &amp; records</u>
15	<u>Project Website (if applicable)</u>	<u>maintains</u>	<u>provides info</u>	<u>provides info &amp; photos</u>
16	<u>Program of Requirements (to be developed with the SBA Staff)</u>	<u>originates</u>	<u>implements</u>	<u>reviews &amp; comments</u>
17	<u>Testing &amp; Inspection Services</u>	<u>request &amp; PO</u>	<u>review</u>	<u>RFP and review</u>
18	<u>Asbestos Consultant (if applicable)</u>	<u>request &amp; PO</u>	<u>tech direction</u>	<u>coordinates &amp; arranges</u>
19	<u>Commissioning Agent (if applicable)</u>	<u>request &amp; PO</u>	<u>RFP &amp; Tech direction</u>	<u>assists in selection</u>
20	<u>Printing Services</u>	<u>reimbursement</u>	<u>performs &amp; distributes</u>	<u>monitors</u>
-	<u>DESIGN</u>	-	-	-
21	<u>SD, DD &amp; CD Design Drawings (Reference SBA Project Submission Requirements - SBA 176)</u>	<u>reviews &amp; approves</u>	<u>originates</u>	<u>reviews &amp; comments</u>

22	<u>Document Coordination</u>	<u>authorizes</u>	<u>originates</u>	<u>reviews &amp; comments</u>
23	<u>Technical Specifications Div. 2 - 17 (Reference SBA Project Submission Requirements)</u>	<u>reviews &amp; approves</u>	<u>originates</u>	<u>reviews &amp; comments</u>
24	<u>Life Cycle Cost Analysis</u>	<u>reviews &amp; approves</u>	<u>originates &amp; advises</u>	<u>review, comments &amp; cost</u>
25	<u>Conceptual Furnishing &amp; Equip Layouts</u>	<u>reviews &amp; approves</u>	<u>originates</u>	<u>reviews &amp; comments</u>
26	<u>Furnishing &amp; Equipment Bidding Documents</u>	<u>reviews &amp; approves</u>	<u>originates</u>	<u>bids &amp; coordinates</u>
27	<u>Technology Plan (Included with DD Phase Submission)</u>	<u>originates</u>	<u>incorporates</u>	<u>reviews &amp; comments</u>
28	<u>Safe School Design Review (Reference SBA Appendix I)</u>	<u>review and comments</u>	<u>originates</u>	<u>review and comments</u>
29	<u>Monthly Team Meetings</u>	<u>participants</u>	<u>participants</u>	<u>conducts &amp; records</u>
30	<u>SD, DD &amp; CD Cost Estimates</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; comments</u>	<u>originates</u>
31	<u>Set DD &amp; CD Bid Packaging</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; comments</u>	<u>originates &amp; recommends</u>
32	<u>Value Engineering Analysis (Cost Savings)</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; implements</u>	<u>originates &amp; advises</u>
33	<u>Agency Review Submissions (Fire Marshall, DEP, Health Dept., etc.)</u>	<u>reviews</u>	<u>originates</u>	<u>assists</u>
34	<u>Building Permit Submissions (if applicable)</u>	<u>approves &amp; pays</u>	<u>originates</u>	<u>assists</u>
35	<u>Cost &amp; Schedule Document Constructability Review</u>	<u>reviews</u>	<u>reviews &amp; implements</u>	<u>originates</u>
36	<u>Develop Bid Alternates</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; implements</u>	<u>advises &amp; recommends</u>
37	<u>Set Bidding Schedules (Coordinate with SBA)</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; comments</u>	<u>advises &amp; originates</u>
38	<u>General Requirements Specifications - Div. 01</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; assists</u>	<u>originates</u>
-	<u>BIDDING / AWARD</u>	-	-	-
39	<u>Develop Bidders Lists</u>	<u>reviews</u>	<u>reviews</u>	<u>originates</u>
40	<u>Bidding Advertisement</u>	<u>publishes</u>	<u>assists &amp; reviews</u>	<u>originates</u>
41	<u>Pre-Bid Meeting (Including SBA pre-bid reminders)</u>	<u>attends</u>	<u>conducts &amp; records</u>	<u>assists &amp; attends</u>
42	<u>Bid Opening</u>	<u>conducts</u>	<u>assists &amp; attends</u>	<u>attend, assist &amp; records</u>
43	<u>Bid Tabulations &amp; Post Bid Forms (including submission to SBA)</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; comments</u>	<u>originates</u>
44	<u>Post Bid Evaluation Meeting</u>	<u>participates &amp; approves</u>	<u>advises &amp; recommends</u>	<u>conducts &amp; recommends</u>
45	<u>Bid Recommendation for Award</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; concurs</u>	<u>originates</u>
46	<u>Construction Contracts</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; comments</u>	<u>originates</u>
-	<u>CONSTRUCTION</u>	-	-	-
47	<u>Pre-Construction Conference</u>	<u>attends</u>	<u>attends &amp; assists</u>	<u>conducts &amp; records</u>
48	<u>Construction Schedules</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; comments</u>	<u>originates</u>

50	<u>Construction Phasing</u>	<u>reviews &amp; approves</u>	<u>reviews &amp; comments</u>	<b><u>originates</u></b>
51	<u>Daily On-Site Observations</u>	<u>No applicable service</u>	<u>No applicable service</u>	<b><u>conducts &amp; records</u></b>
52	<u>Monthly On-Site Observations by Architect / Engineer (SBA Requirements)</u>	<u>No applicable service</u>	<b><u>performs &amp; reports</u></b>	<u>assists &amp; participates</u>
53	<u>Weekly Trade Coordination Meetings</u>	<u>No applicable service</u>	<u>No applicable service</u>	<b><u>conducts &amp; records</u></b>
54	<u>Bi-Weekly Progress Meetings</u>	<u>attends</u>	<u>attends</u>	<b><u>conducts &amp; records</u></b>
55	<u>Pre-Installation Meetings</u>	<u>No applicable service</u>	<u>attends &amp; participates</u>	<b><u>conducts &amp; records</u></b>
56	<u>Contractor Payment Applications</u>	<u>approves &amp; pays</u>	<b><u>reviews &amp; certifies</u></b>	<u>receives &amp; recommends</u>
57	<u>Contractor Certified Payrolls</u>	<u>reviews &amp; files</u>	<u>No applicable service</u>	<b><u>receives &amp; transmits to Owner</u></b>
58	<u>Shop Drawings &amp; Product Data</u>	<u>No applicable service</u>	<b><u>reviews &amp; approves</u></b>	<u>receives &amp; reviews</u>
59	<u>Contractor Requests for Information</u>	<u>No applicable service</u>	<b><u>reviews &amp; responds</u></b>	<u>prepares &amp; transmits to Architect</u>
60	<u>Decisions on Contractor Claims</u>	<u>approves</u>	<b><u>reviews, approves &amp; recommends</u></b>	<u>advises Architect</u>
61	<u>Contractor Change Requests</u>	<u>approves</u>	<u>reviews &amp; recommends</u>	<b><u>prepares &amp; recommends</u></b>
62	<u>Contractor Time Extensions</u>	<u>approves &amp; accepts</u>	<u>reviews &amp; recommends</u>	<b><u>prepares &amp; recommends</u></b>
63	<u>Construction Defects</u>	<u>participates</u>	<b><u>identifies &amp; recommends</u></b>	<u>assists &amp; recommends</u>
-	<b><u>CLOSE-OUT</u></b>	-	-	-
64	<u>Final Completion Checklist / Punch list</u>	<u>reviews &amp; accepts</u>	<b><u>identifies &amp; recommends</u></b>	<u>assists &amp; recommends</u>
65	<u>Project Closeout Procedures (including SBA 178)</u>	<u>receives &amp; executes documents</u>	<u>receives &amp; transmits to Owner</u>	<b><u>schedules &amp; transmits to Architect &amp; SBA</u></b>
-	<b><u>POST OCCUPANCY</u></b>	-	-	-
66	<u>11-month Warranty Follow-up</u>	<u>participates &amp; approve</u>	<b><u>conducts</u></b>	<u>participates</u>
67	<u>Maintenance and Energy Report (SBA 179)</u>	<b><u>compile and submit</u></b>	<u>No applicable service</u>	<u>No applicable service</u>

SBA 189

6/2015

**SBA FORM 190**

**BUILDING INFORMATION MODELING (BIM)**  
**GUIDELINES AND STANDARDS FOR**  
**ARCHITECTS, ENGINEERS, AND**  
**CONTRACTORS**

School Building Authority of West Virginia  
**BUILDING INFORMATION MODELING (BIM) GUIDELINES AND STANDARDS FOR ARCHITECTS, ENGINEERS, AND CONTRACTORS**

This BIM Guideline and Standard applies to School Building Authority projects funded beginning December 2015 based on the following criteria:

- Required on all new construction with a total project funding of \$10 million or greater, and on any project that has already been delivered with a BIM requirement.
- The School Building Authority goal is to implement BIM for design and construction of future SBA Funded projects as follows:
  - New School Construction Projects beginning in December 2015.
  - All New School Construction and Major Addition and Renovation Projects beginning in December 2016.
  - Implementation of BIM on all projects beginning December 2017.
  - BIM modeling information data provided to the owners for use in their preventative maintenance data bases state wide by 2019.

For more information and updates on SBA BIM guidelines and standards, please visit our website:  
<http://www.wvs.state.wv.us/wvsba/>

1. General Requirements

1.1. Design Team Software

Building information models shall be created to include all geometry (civil, structural, mechanical, electrical and plumbing systems), physical characteristics and product data (make, model numbers and serial numbers) needed to describe the design and construction work of a project. All drawings, schedules, simulations, and services required for assessment, review, bidding, and construction shall be extractions from this model. The Design Team shall follow the guidelines and requirements detailed in this document for BIM related services. Deliverable requirements are as specified in the SBA Policy and Procedures Handbook and this document.

1.2. Civil Engineering Software

Models shall be created that include all geometry, physical characteristics, and product data needed to describe the design and construction work to within 5' of building envelope. Drawings and schedules required for assessment, review, bidding, and construction shall be extractions from this model. Software shall be capable of interfacing with the Design Team's BIM authored software. In all cases, model building and infrastructure systems to a level that allows the team to verify clearances, analyze conflicts/clashes and properly coordinate the work with all other aspects of this project. The Design Team shall follow the guidelines and requirements detailed in this document for BIM related services. Deliverable requirements are as specified in the SBA Policy and Procedures Handbook and this document.

1.3. BIM Authoring Software

The Design Team is required to use parametric BIM Authoring software for SBA projects. The deliverable file format for all BIM project Models shall be of open standards similar to IFC, COBie, structured data as well as the native file format, such as Revit.)

#### 1.4. Open Architecture for Interoperability

The School Building Authority has adopted open architecture for data exchange. The Design Team is encouraged to use products based on or using open architecture for greatest interoperability between consultants.

#### 1.5. Project Collaboration Tools

The Design and Construction Team is required to use an internet “cloud” based electronic project collaboration environment capable of managing various versions of the project documents and models for document management and file sharing. The owner must be provided access to the tools for the purposes of collecting data for facility management and preventative maintenance both during and post project. The project collaboration environment shall be accessible by both computer and tablet. (examples: ProjectDox, Buzzsaw)

### 2. Process

#### 2.1. BIM Proficiency Matrix

The Design Team shall submit to the School Building Authority upon request and ahead of contract award, an SBA BIM Proficiency Matrix. The SBA BIM Proficiency Matrix template is located on the web for download at: <http://www.wvs.state.wv.us/wvsba/>. The BIM Proficiency Matrix will be reviewed by the SBA to give an overview of the Consultant(s) BIM expertise and experience. The BIM Proficiency Matrix is scored by the Consultant (1 point per credit area) and should include examples of actual projects where BIM was applied.

#### 2.2. BIM Execution Plan

The Design Team shall submit to the SBA within thirty (30) days of contract award, a BIM Execution Plan. The BIM Execution Plan’s template is located on the web for download at: <http://www.wvs.state.wv.us/wvsba/>. The BIM Execution Plan will be reviewed and approved by the SBA within fourteen (14) days of submission. The BIM Execution Plan shall identify the entire Design Team including all consulting engineers and specialty consultants. The BIM Execution Plan also should include roles and responsibilities of the contractor(s) even if that party has not yet been identified. The BIM Execution Plan will be a part of the final bid documents.

#### 2.3. IPD (Integrated Project Delivery) Methodology Plan

The Design Team shall submit to the SBA within thirty (30) days of contract award, an IPD Methodology Plan. The IPD Methodology Plan’s template is located on the web for download at: <http://www.wvs.state.wv.us/wvsba/>. The IPD Methodology Plan will be reviewed and approved by the SBA within fourteen (14) days of submission. The IPD Methodology Plan shall demonstrate a high level of integrated design while identifying project team members and how they will interact with each other during the project. This plan will include a critical path methodology on modeling procedures and model information validation. Examples of IPD Methodology plans are, but are not limited to: Reverse Phase Scheduling and Critical Path Modeling. The IPD Methodology Plan will be a part of the final bid documents.

#### 2.4. Model Quality

The Design Team shall establish and use in-house modeling quality control guidelines and exchange protocols. Good BIM practices may include, but are not limited to:

- Use of element and component objects that embed the best practices of the firm.
- Maintenance of parametric linkages within the model at all times.

- The building envelope needs to be "air-tight" and correct to help support energy modeling activities and simulations.
- Use industry standard defined nomenclature for objects and spaces. (IFC, COBie)
- Use appropriate and interoperable viewing, checking, and output file formats

3. Design Team Deliverable Schedule and Milestones

The submittal schedule along with the milestones for any given project is listed below:

<u>Milestone</u>	<u>Deliverable</u>
<u>Conceptualization Phase</u>	<u>Architectural Massing Model</u>
<u>Schematic Design Phase</u>	<u>Architectural Model</u>
	<u>Initial Collision Report</u>
	<u>Square Foot Cost Analysis (Upon Request)</u>
<u>Design Development</u>	<u>Architectural Model</u>
	<u>MEP Model or Models</u>
	<u>Structural Model</u>
	<u>Discipline Collision Report</u>
	<u>System Cost Estimate</u>
	<u>Program Validation</u>
<u>Construction Documents</u>	<u>Architectural Model</u>
	<u>MEP Model or Models</u>
	<u>Structural Model</u>
	<u>Pre-Bid Collision Report</u>

*The rest of the deliverables and milestones for the Design Team are shown later in the document.*

4. Objectives and Application – Architecture and Engineering Design Professionals

*Note: The Design Professionals are responsible for the development of all design models to Level 300 as outlined in the most current "BIMFORUM Level of Document Specification."*

4.1. Pre-Design Phase (Conceptualization)

4.1.1. General

The Design Team is encouraged to use electronic programming and planning tools that integrate into their BIM Authoring software to capture early cost, schedule and program information during this phase.

4.1.2. Topographic and Property Line Surveying

Detailed requirements of what is to be included in surveying deliverables is managed by the Construction Manager in consultation with the Design Team on a project-by-project basis. Surveys shall be provided in electronic format and should include at minimum: 3D topographic information, paving and retaining walls. The file(s) shall be in a format that allows for importing into the Design Team's BIM authoring software.

4.1.3. Existing Conditions

The Design Team shall model all existing conditions needed to explain the extent of the construction work for alterations and additions projects. The extent of modeling beyond the affected areas and the level information to be included will be determined based on project needs. These requirements may be stated in the project program or discussed during the project kickoff meeting. The BIM Execution Plan should define the agreed upon scope of the modeling effort.

#### 4.2. Schematic Design Phase (Criteria Design)

##### 4.2.1. General

The Design Team may use any method to begin the design process but shall be using a BIM authored model(s) by completion of this phase. All information needed to describe the schematic design shall be graphically or alphanumerically included in and derived from these models. The SBA expects the Design Team to use analysis tools, static images and interactive 3D to describe the design concepts. Deliverables are required as stated in Section 2.3.

##### 4.2.2. Square Foot Cost Analysis

The Design Team shall extract square foot information using BIM Authoring Software and other BIM integrated tools to support comparative costs analysis of options studied. Outputs shall be converted to spreadsheets and submitted as part of the design solution justification at end of this phase.

##### 4.2.3. Program and Space Validation

The Design Team shall use the BIM Authoring software or other analysis tools to compare and validate stated program requirements (normally provided by the SBA and the County Board of Education) with the actual design solution. The following shall be developed automatically from the building information model:

- Assignable Areas (ASF) and Non-assignable Areas (NaSF) measured to inside face of wall objects and designated boundaries of areas.
- Gross Area (GSF) measured to the outside face of wall objects.

##### 4.2.4. Initial Collision Report

###### 4.2.4.1. General

The Design Team is to use automated conflict checking software for this phase of the work and shall be outlined in the BIM Execution Plan. The collision report should show any outstanding coordination issues between the Design Team members.

###### 4.2.4.2. Level One Collisions

Level One Collisions are reported collisions that are considered critical to the design and construction process. These collisions have been assigned the highest priority and should be rectified within the model as soon as possible:

- Mechanical Ductwork and Piping vs. Ceilings
- Mechanical Ductwork and Piping vs. Rated Walls (For coordination of Dampers and other mechanical equipment needs)
- Mechanical Ductwork and Piping vs. Structure (Columns, Beams, Framing, etc.)
- All Equipment and their applicable Clearances vs. Walls
- All Equipment and their applicable Clearances vs. Structure

- Mechanical Equipment and Fixtures vs. Electrical Equipment and Fixtures
- Mechanical Ductwork and Piping vs. Plumbing Piping

#### 4.2.4.3. Level Two Collisions

Level Two Collisions are reported collisions that are considered important to the design and construction process. These collisions have been assigned a greater priority and should be rectified during project meetings during design:

- Structure (Columns, Beams, Framing, etc.) vs. Specialty Equipment
- Structure (Columns, Beams, Framing, etc.) vs. Electrical Equipment, Fixtures and Devices
- Ductwork and Piping vs. Electrical Equipment, Fixtures, and Devices
- Ductwork vs. Floors

#### 4.2.4.4. Level Three Collisions

Level Three Collision are reported collisions that while considered important to the correctness of the model will generally be changing on a regular basis throughout the design and construction process. These collisions have been assigned a lower level of priority and should be rectified before the phase submission of the models:

- Plumbing Piping vs. Electrical Equipment, Fixtures, and Devices
- Plumbing Piping vs. Mechanical Equipment, Fixtures, and Devices

#### 4.2.4.5. All Other Collisions

While the above collisions have been assigned priorities other collisions will exist within the models. The collisions are not all ignorable nor should they be discarded. Some collisions will exist because the software available is not yet mature enough to support the modeling efforts. The intention should be to have a model that is as error and collision free as possible at each submission phase with documented proof that the design team addressed the prior collisions above.

#### 4.2.5. Planning Tools

The Design Team is encouraged to use electronic programming and planning tools that integrate into BIM Authoring software to continue project development at this phase.

### 4.3. Design Development Phase (Detailed Design)

#### 4.3.1. General

The Design Team shall continue development of their Building Information Model. Parametric links shall be maintained within the models to enable automatic generation of plans, sections, elevations, custom details and schedules as well as 3D views. All information needed to describe the “detailed design” shall be graphically or alphanumerically included in and derived from these models only, except for the Specifications. All documentation of the models happening outside of the BIM Authoring software, must be linked to all other documentation created creating one cohesive model from all sources of information. The quality of the models shall be as stated in Section 2.3.

#### 4.3.2. Architectural Systems

The model should include the following architectural elements to a level that defines the design intent and accurately represents the design solution:

- Architectural Site plan (also see Civil Engineering section below)

- Paving, grades, sidewalks, curbs, gutters, site amenities and other elements typically included on enlarged scale site drawings in building vicinity.
- Existing conditions to the extent required by 3.1.4.
- Demolished items to the extent required by 3.1.4.
- New interior and exterior walls including but not limited to:
  - Doors, windows, openings
  - Interior and exterior soffits, overhangs, sun control elements
  - Parapets, screening elements
  - Architectural precast

*All finishes need to be included within the wall type regardless of the thickness of the finish*
- Floor, ceiling and roof systems including but not limited to:
  - Appropriate structural items listed below if not provided by the structural engineer and integrated into the architectural model for coordination and document generation.
  - Insulation, ceiling systems, and floor are to be included.
  - Roof, floor and ceiling slopes, if needed, shall be modeled.
  - Soffits, openings, and accessories will also be modeled.
- Elevators, stairs, and ramps (including railing systems)
- Fixtures, and equipment (if not provided by others and integrated into the architectural model for coordination and document generation.)
  - Specialty equipment (food service, medical, etc)
  - Model mechanical, electrical and plumbing items that require architectural space (toilets/sinks/etc), require color/finish selection (louvers, diffusers, etc.) or affect 3D visualization (lighting fixtures) unless provided by engineers.
- Clearance zones for access, door swings, service space requirements, gauge reading, and other operational clearance must be modeled as part of all equipment and checked for conflicts with other elements. These clearance zones should be modeled as invisible solids within the object.

*The detail and responsibility to fulfill the above modeling requirements should be addressed fully within the BIM Execution Plan.*

#### 4.3.3. Structural Engineering

The model should include the following structural elements:

- Foundations such as:
  - Spread Foundations
  - Caisson Foundations
  - Pile Foundations
  - Mat Foundations
  - Load-bearing Wall Foundations
- Framing such as:
  - Steel Columns (with correct shape and size)
  - Steel Floor C-Joists
  - Open Web Joists
  - Joist Girders
  - Steel Beams (with correct shape and size)

- Precast Concrete Elements (Hollow Core Plank may be modeled as a slab unless the hollow core is being used for mechanical systems and coordination with those systems needs to occur)
- Cast-In-Place Concrete Elements
- Floors including overall extents and openings
- Model overall thickness of wood floor systems
- Wood Posts/Column
- All other Joists
- Wood Trusses
- Solid Wood or Laminated Beams
- Wall Types including openings
  - Load Bearing Walls – for calculations only (Masonry, Concrete, Cold-Formed Steel, and Wood)
  - Model overall thickness of Cold-Formed Steel and Wood Stud walls (individual members may be modeled at the Design Team’s option)
  - Structural Foundation Walls including brick ledges
- These items may be modeled at the Design Team’s option:
  - Steel reinforcing in concrete
  - Embeds in concrete
- Miscellaneous Steel
  - Angles for openings, deck bearing, etc.
  - Channels for mechanical units needed for coordination reviews between structural and mechanical
  - Lintels (unless considered a major member)

*The detail and responsibility to fulfill the above modeling requirements should be addressed fully within the BIM Execution Plan.*

#### 4.3.4. HVAC Systems

The model should include the following HVAC elements at a minimum:

- Equipment
  - Fans, VAV’s, compressors, chillers, cooling towers, air handlers etc.
- Distribution
  - Supply, return, exhaust, relief and outside air ductwork modeled to outside face dimension or duct insulation (whichever is greater)
  - Diffusers, grilles, louvers, hoods, radiant panels, perimeter units, wall units
- Pipes larger than 3/4” diameter, include any insulation in model. Unless otherwise noted and approved by the BIM Execution Plan.
- Clearance zones for access, door swings, service space requirements, gauge reading, and other operational clearance must be modeled as part of the HVAC equipment and checked for conflicts with other elements. These clearance zones should be modeled as invisible solids within the object.

*The detail and responsibility to fulfill the above modeling requirements should be addressed fully within the BIM Execution Plan.*

#### 4.3.5. Electrical Systems

The model should include the following electrical elements at a minimum:

- Power and Telecommunications

- Interior and exterior transformers, emergency generators, and other equipment
- Main and distribution panels and switchgear including access clearances
- Main IDF's
- Feeders and conduit larger than 3/4" diameter. Unless otherwise noted and approved by the BIM Execution Plan.
- Outlets, switches, junction boxes
- Lighting
  - Permanently mounted lighting fixtures (moveable, plug-in fixtures need not be modeled as part of the electrical package unless needed for plug load calculations or for estimating purposes within a loose furnishings package. Should be discussed and agreed upon within the BIM Execution Plan)
  - Lighting Controls
  - Switches
  - Junction Boxes
- Fire Alarm and Security Systems
  - Input devices
  - Notification devices
  - Associated equipment and access clearances
  - Permanently mounted fixtures
- Building Controls
- Clearance zones for access, door swings, service space requirements, gauge reading, valve clearances and other operational clearance must be modeled as part of the electrical equipment for collision checking. These clearance zones should be modeled as invisible solids within the object.

*The detail and responsibility to fulfill the above modeling requirements should be addressed fully within the BIM Execution Plan.*

#### 4.3.6. Plumbing and Fire Protection

The model should include the following plumbing and fire protection elements at a minimum:

- Waste and Vent Piping sized at and over 3/4" diameter, includes any insulation in model. Unless otherwise noted by the BIM Execution Plan.
  - Roof and floor drains, leaders, sumps, grease interceptors, tanks, water treatments and other major items.
- Supply Piping larger than 3/4" diameter, includes any insulation in model. Unless otherwise noted and approved by the BIM Execution Plan.
  - Domestic Booster Pumps
- Fixtures: sinks, toilet fixtures, water tanks, floor sinks
- Fire protection
  - Sprinkler lines larger than 3/4" diameter
  - Sprinkler heads, Fire Protection Pumps
  - Stand pipes, wall hydrants, fire department connections, risers, including valve clearances
- Clearance zones for access, service space requirements, gauge reading, valve clearances and other operational clearance must be modeled as part of the plumbing and fire protections system and checked for conflicts with other elements. These clearance zones should be modeled as invisible solids within the object.

The detail and responsibility to fulfill the above modeling requirements should be addressed fully within the BIM Execution Plan.

#### 4.3.7. Civil Engineering

If a Civil BIM model is used it should include the following civil engineering elements at a minimum:

- Topography – 3D terrain of all site work as designed, including retaining walls. This model should include the site and surrounding areas that contribute to the site’s drainage system or otherwise impact on the site. In most cases this will require that adjacent roadways be modeled.
- Landscaping elements: planting areas, such as raised planting beds and berms, parking islands, pools/ponds/other water features, terraces and other items not included elsewhere in the model.
- Stormwater management structures, pump stations, fueling systems, manholes and other major items that impact on the overall project understanding or which may become project design constraints. All items must be geo-referenced such that all elements can be viewed as an overlay in the building information model.

#### 4.3.8. Discipline Collision Reports

See Section 4.2.4.

#### 4.3.9. Program Space and Validation

The Design Team shall use the methodology described in section 4.2.3 to reconfirm that program requirements are met.

#### 4.3.10. Other analysis and Checking Tools

The Design Team is encouraged to analyze the design using software that interacts with the model in order to refine load calculations, daylight, natural ventilation, acoustics, code issues, and design issues.

#### 4.3.11. Systems Cost Estimating

The Design Team shall extract square foot and system information using BIM Authoring software and other BIM integrated tools to support comparative costs analysis of options studied. Outputs shall be converted to spreadsheets and submitted as part of the deliverable at the end of this phase.

### 4.4. Construction Documents Phase

#### 4.4.1. General

The Design Team shall continue development of the models created in the Design Development Phase. Parametric links should be maintained within the respective models to enable automatic generation of all plans, sections, elevations, custom details, schedules and 3D views. All information needed to describe the “Execution documents” shall be graphically or alphanumerically included in and derived from these models only. Specifications are not required to be linked within the models. Model quality shall be as stated in Section 2.3.

#### 4.4.2. Pre-Bid Collision Reports

See section 4.2.6.

Submit at 95% Construction Document Submittals

#### 4.4.3. Program and Space Validation

The Design Team shall use the methodology described in section 4.2.4 to reconfirm that program requirements are met.

#### 4.4.4. Other Analysis and Checking Tools

The Design Team is encouraged to analyze the design using software that interacts with the model in order to refine load calculations, daylighting, natural ventilation, acoustics, code issues and design issues.

#### 4.4.5. Quantity Cost Estimating

The Design Team shall extract square quantity takeoff information using BIM Authoring Software and other BIM integrated tools to support comparative costs analysis of options studied. Outputs shall be converted to spreadsheets and submitted as part of the design solution justification at end of this phase.

### 4.5. Bidding Phase

#### 4.5.1. General

The Design Team shall update the models with all addendum, accepted alternates and/or value enhancement proposals.

#### 4.5.2. Contractor Bidding

Contractors who are bidding on this project are to review the BIM Execution Plan, the IPD Methodology Plan, and the SBA Building Information Modeling (BIM) Guidelines and Standards for Architects, Engineers, and Contractors before bidding. Contractor will follow the guidelines and requirements as set forth by the BIM Execution Plan and the IPD Methodology Plan.

#### 4.5.3. SBA BIM Proficiency Matrix

Interested Contractors shall submit to the SBA prior to bid submittal, a SBA BIM Proficiency Matrix. The SBA BIM Proficiency Matrix template is located on the web for download at: <http://www.wvs.state.wv.us/wvsba/>. The SBA BIM Proficiency Matrix will be reviewed by the SBA to give an overview of the Contractor(s) BIM expertise and experience. The BIM Proficiency Matrix is scored by the Contractor (1 point per credit area) and should include examples of actual projects where BIM was applied. 3D CAD and SketchUp are not to be counted as BIM examples/expertise.

#### 4.5.4. Construction Documents Deliverable

Ten days after the project is awarded for construction, the Design Team shall submit to the Construction Manager's/Contractor's Office one set of the Construction Document Deliverables. This deliverable shall consist of CAD files representing every sheet in the Bid Documents. Each sheet is to have its own unique file. Native word processing files (Word or WordPerfect) for all specifications shall also be included. Any addenda files in their native format shall also be included. Final payment for services rendered during the bidding phase is contingent upon approved acceptance of these documents.

5. Objectives and Application – Construction Team Members

Note: All Prime Contractors are responsible for the development of all construction models to Level 400 as outlined in the “BIMFORUM Level of Development Specification.” When applicable, models shall be forwarded to the construction manager for coordination and incorporation in to As-Built Drawings.

5.1. Construction Phase

5.1.1. General

The Design Team and/or Construction Manager is expected to continuously maintain and update the design intent model(s) with changes made from official Construction Change Directives and as-built mark-ups maintained on site by the Contractor(s) during construction. At an interval that is decided within the BIM Execution plan or at minimum once a month during construction the updated design intent model will be published and posted to the “cloud” based project collaboration site for each project.

<u>Milestone</u>	<u>Deliverable</u>
<u>Construction Phase (Contractor)</u>	<u>Discipline Specific Coordination Models</u>
	<u>Shop Drawing Models (If Applicable)</u>
	<u>Fabrication Models</u>
	<u>As-Built Markups (3D dwf/pdf or 2D dwf/pdf format)</u>
	<u>Scheduling and Phasing Models</u>
<u>Construction Phase (Design Team)</u>	<u>Current As-Built Models for Each Discipline</u>

5.1.2. BIM Execution Plan Review

The Contractor shall review the BIM Execution Plan with the Design Team/Construction Manager and submit any Addendums within thirty (30) days of contract award. The Design Team/Construction Manager will review and approve of any Addendum within fourteen (14) days of submittal.

5.1.3. Construction Models

5.1.3.1. General

These models could include fabrication models, coordination models, or shop drawing models. These models will now be referred to as the Construction Models.

5.1.3.2. Modeling Requirements

The Construction Models should reflect the exact geometric properties of the materials and/or systems being submitted. These models should reflect the exact material properties and performance data.

5.1.3.3. Deliverables

All Prime Contractors shall submit all models to the Construction Manager/Contractor in both a Navisworks format and a 3D DWF format. These models should be updated after each project coordination meeting or as changes occur in the field during construction.

#### 5.1.4. Coordination Meetings

##### 5.1.4.1. General

The contractor shall submit a plan to the Owner for review, prior to the start of construction that outlines the process for concurrent as-built documentation. Concurrency is mandated. Methods for recording as-built information are left to the discretion of the contractor. Potential options include traditional methods, and/or periodic laser scanning of completed or partially completed primary systems coordinated with the sequence of construction. Primary systems fall into two categories:

Primary Architectural Systems include, but may not be limited to: Partition systems with structure, flooring systems, major HVAC, piping, sewerage and /or conduit systems, partition systems with bulkheads, partition systems with expansion control, vertical transportation systems with primary engineering systems, horizontal ceiling systems with window openings, bulkheads, partitions, lighting, fire protection and HVAC outlet locations, exterior skin systems with window openings, structure, roof edge conditions, parapets, roof penetrations, and equipment locations.

Primary Engineering Systems include, but may not be limited to: structural framing, primary HVAC duct runs, primary fire protection main runs, primary electrical conduits (larger than ¾" diameter), ceiling grid layouts, primary data, audio/visual, security and communication distribution systems (cable trays, etc.).

##### 5.1.4.2. Projects With Active BIM Models at the Start of Construction

If BIM models are provided by the A/E at the start of construction, the contractor shall use those models in support of the objectives noted in 4.6.4.2.

##### 5.1.4.3. Coordination With The Design Team and Owner

On no less than a biweekly basis the contractor shall include the project model manager, (architect's or other) in a coordination established for the purpose of assessing and / or executing FM/PM data transfers from the construction process into the model. The data transfer shall be coordinated with the Owner representative and the architect's model manager (when feasible) and be based on the FM/PM objectives as defined in the BIM Execution Plan and project program.

##### 5.1.4.4. Deliverables

Coordination files should be created at all critical coordination milestones. This record format will document a coordinated section of the model, either by area of the building or between specific critical trades. The Collision report showing all applicable collisions as either Approved or Resolved along with the coordination file shall be uploaded together to "cloud" based project collaboration environment. A text document shall also be uploaded which describes and references the approved coordination file with respect to what has and has not been coordinated.

5.1.5. Collision Reports

The Contractor is to utilize software designed to provided collision reporting. Collision reports from the software should be published weekly in a standard XML, HTML, or Text format. These reports shall include the following information at a minimum:

- Description of Collision Report
- Date of Collision Report Run
- List of all Collisions detected, their status, and their proposed solution.

5.1.6. Concurrent As-Builts

5.1.6.1. General

The contractor shall submit a plan to the Owner for review, prior to the start of construction that outlines the process for concurrent as-built documentation. Concurrency is mandated. Methods for recording as-built information are left to the discretion of the contractor. Potential options include traditional methods, and/or periodic laser scanning of completed or partially completed primary systems coordinated with the sequence of construction. Primary systems include, but may not be limited to: structural framing, primary HVAC duct runs, primary fire protection main runs, primary electrical conduits (larger than 3/4" diameter), ceiling grids layouts.

5.1.6.2. Scheduling

The sequence of concurrent as-builts shall be recorded in the contractor's project schedule as a line item event.

5.2. Project Close-Out

<u>Milestone</u>	<u>Deliverable</u>
<u>Project Close-Out (Design Team)</u>	<u>As-Built Models</u>
	<u>Record Document Project Drawings (.pdf format)</u>
	<u>Record Document Drawings (3 sets on paper)</u>
<u>Project Close-Out (Contractor)</u>	<u>Scanned Field Set Drawings – As BUILTS (.tif format)</u>
	<u>O&amp;M Manuals (paper/.pdf/excel format)</u>
	<u>Coordination Models in their native file format</u>

5.2.1. Design Team As-Builts

The Design Team/Construction Manager shall update their respective models with contractor recorded changes (Record Documents). Republish record documents in paper, .dwg and .pdf formats.

5.2.2. Contractor Record Documents

The contractor shall submit one set of scanned field set drawings (Record Documents) in .tif format (at substantial completion).

5.2.3. O&M (Operations & Maintenance) Manuals

The Construction Manager/Contractor shall submit the following information to the County Board of Education – two paper copies in binders of the O&M Manuals: (1) the make, model and serial number of each piece of installed equipment, (2) the location of any equipment installed in the building, and (3) manufacturer’s documents including cut sheets, installation instructions, and recommend maintenance tasks, testing or other reports. An electronic format of the O&M manuals shall also be submitted along with the paper copies, the format shall be color PDF and native Excel files (at substantial completion).

5.2.4. Project As-Built and Record Document Deliverable Matrix

The following matrix outlines the various As-Built and Record Documents deliverables that are required on four different project categories with the associated responsible parties that will be in place as of April, 2015.

<u>Deliverable</u>	<u>Responsible Party</u>	<u>Quantity</u>	<u>Format</u>	<u>Due Date</u>
<u>SBA BIM Proficiency Matrix</u>	<u>A/E, C</u>	<u>1 set</u>	<u>.xls/.pdf</u>	<u>Prior to Bid Submittal</u>
<u>SBA BIM Execution Plan</u>	<u>A/E, CM, C</u>	<u>1 set</u>	<u>.doc/.pdf</u>	<u>30 Days after contract award</u>
<u>Owner’s Architectural Floor Plan – Interim As-Built Drawing</u>	<u>CM, C</u>	<u>1 set</u>	<u>.dwg</u>	<u>3 months prior to Substantial Completion</u>
<u>Owner’s Architectural Floor Plan – Interim Record Drawing</u>	<u>A/E</u>	<u>1 set</u>	<u>.dwg</u>	<u>3 months prior to Substantial Completion</u>
<u>Telecommunications Drawings – Interim As-Built Drawings</u>	<u>CM, C</u>	<u>1 set</u>	<u>.dwg/.pdf</u>	<u>3 months prior to Substantial Completion</u>
<u>Telecommunications Drawings – Interim Record Drawing</u>	<u>A/E</u>	<u>1 set</u>	<u>.dwg/.pdf</u>	<u>3 months prior to Substantial Completion</u>
<u>Operations &amp; Maintenance Manuals (O&amp;M)</u>	<u>CM, C</u>	<u>2 sets</u>	<u>binders</u>	<u>At Substantial Completion</u>
	<u>CM, C</u>	<u>1 set</u>	<u>.pdf</u>	<u>At Substantial Completion</u>
<u>As-Built CAD Drawings – By Contractor</u>	<u>CM, C</u>	<u>1 set</u>	<u>.dwg</u>	<u>Prior to Final Payment</u>
	<u>CM, C</u>	<u>1 set</u>	<u>.pdf</u>	<u>Prior to Final Payment</u>
	<u>CM, C</u>	<u>3 sets</u>	<u>paper</u>	<u>Prior to Final Payment</u>
<u>As-Built BIM Model(s) – By Contractor, Construction Manager</u>	<u>CM, C</u>	<u>1 set</u>	<u>.rvt</u>	<u>Prior to Final Payment</u>
<u>As-Built BIM Model(s) – By A/E</u>	<u>A/E</u>	<u>1 set</u>	<u>.rvt</u>	<u>Prior to Final Payment</u>
<u>Record Document CAD Drawings – By A/E</u>	<u>A/E</u>	<u>3 sets</u>	<u>Paper</u>	<u>Prior to Final Payment</u>
	<u>A/E</u>	<u>1 set</u>	<u>.dwg</u>	<u>Prior to Final Payment</u>
	<u>A/E</u>	<u>1 set</u>	<u>.pdf</u>	<u>Prior to Final Payment</u>

Responsible Parties

A/E = Owner’s Representative (Owner’s Representatives Architect/Engineers)

C = Contractor

CM = Construction Manager (On multiple-prime projects where a CM is used, the CM shall be responsible for the above listed items)

6. Ownership and Rights of Data

The Architect has ownership of all CAD files, BIM Models, and Facility Data developed for the Project through the completion of Construction. At the end of Construction, The SBA and/or the County Board of Education has ownership of all CAD files, BIM Models, and Facility Data developed for the Project. The SBA and/or County Board of Education may make use of this data following any deliverable.

7. Terminology

A

As-Built Documents

As-built documents are the collection of paper drawings or electronic drawings that typically reside in the contractor's onsite trailer that contain mark-ups, annotations, and comments about changes that have been made to the contract documents during the construction phase.

As-Built Model

Design Intent Models that have been updated throughout the construction process. These changes and updates have been communicated from the Contractor to the Design Team through the comments, annotations, and mark-ups from the As-Built Documents. These typically, but not always, are discipline specific models.

B

BIM Execution Plan (BEP)

A plan that is created from the School Building Authority's BIM Execution Plan Template that is to be submitted thirty (30) days after contract award. The BEP helps to define roles and responsibilities within a project team.

BIM Proficiency Matrix (BPM)

A matrix that was designed to measure the expertise of a firm as it relates to using a BIM process on projects. It will be used as one of the many selection criteria during the selection process.

C

Critical Path Modeling

Critical Path Modeling Is a method of demonstrating Integrated Project Delivery. It sets a plan within the design and construction teams that account for the activities of each discipline and how they interact with each other. It builds upon a critical path method for those activities, and allows the project team to schedule a complete project.

D

Design Team

The Design Team is considered to be the Architect and all of the consultants that provide design services for a project. These design services can be rendered at any time during the project.

.DWF

.DWF is a file type that was developed by Autodesk to be locked file for drawing sheets and model data. It can be used as a file transfer for estimating data, markups, and other third party software. It can be a combination of 3D and 2D information within the same file.

#### .DWG

.DWG is a native AutoCAD file format. It is a widely used file format for exchanging drawing information and 3D information to different programs. While not a database file type, it still has lots of uses for exchanging information.

#### I

##### IPD – Integrated Project Delivery

IPD describes a contractual relationship between Owner, Architect, and Contractor. It is a project delivery method that integrates people, systems, business structure and practices into a process that collaboratively harness the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction.

##### IPD Methodology

IPD Methodology is a concept that uses methods from the IPD contracts, but does not have the contracts actually in place. It idealizes the concepts of integration of all team members to try and benefit the entire project.

##### IPD Methodology Plan

The IPD Methodology Plan is a declaration of how the project team will achieve the goals of an IPD Methodology. The plan can have several components. Two examples of an IPD Methodology Plan are: The completion of a Reverse Phase Schedule and Critical Path Modeling.

#### L

##### LEED

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System is a suite of standards for environmentally sustainable construction. Based on a point system, a building can achieve different ratings based on the performance of the design, construction, and operation of the building.

#### N

##### Navisworks

Navisworks is software that allows for the viewing of multiple model formats. This ability to “view” these files also allows for Navisworks to simulate the interaction between model files. That includes collision reporting, time lining, and coordination.

##### .NWC

An .NWC file is a Navisworks Cache File that is used by Navisworks to quickly read many other file types. All linked files in Navisworks have an .NWC file created automatically. In addition, Revit will export directly to the very small file type of .NWC for quick access by Navisworks.

##### .NWD

A much larger file than the .NWC, the .NWD file shows a snapshot in time of a Navisworks file. No linked files exist but all geometry is included.

## .NWF

The .NWF file is a native Navisworks file which has all linked files, clashes, markups, animations, schedules, etc.

## O

### Open Architecture

Open Architecture is a concept of creating a framework that helps to describe a common set of rules for how a project is created. This includes what types of software, the interoperability of the information, and how the participants interact with each other. This is different than open standards because it promotes progress without anchoring forward thinkers to a rigid standard.

### Owner's Architectural Floor Plans – Interim Record Documents

A complete current electronic CAD set of Owner's Architectural floor plan drawings with room names, room numbers, and room square footages indicated. The Owner's Representative shall not be relieved of responsibility when files are delivered if the files do not meet established requirements or are defective. These are to be submitted 3 months prior to Substantial Completion.

## P

### Phases

The phases of a project can be describe in two different ways as the adoption of IPD terminology starts to penetrate the BIM Execution Plan and the IPD Methodology Plan. Below is a list of the traditional names followed by the IPD name:

Pre-Design/Conceptualization Phase

Schematic Design/Criteria Design Phase

Design Development/Detailed Design Phase

Construction Documents/Implementation Phase

## R

### Record Drawing

The production of Record Drawings is the capturing of the As-Built Document's annotation, comments, and mark-ups in a drawing format only. This does not typically include the updating of any models.

### Reverse Phase Scheduling

Reverse Phase Scheduling Is a method of demonstrating Integrated Project Delivery. It sets a plan within the design team that accounts for the activities of each discipline and how they interact with each other. It uses the completion date as a point to work backward from to schedule all of the project's activities.

## .RVT

An .RVT file is a native REVIT file type. It is also the deliverable file format for all projects. This includes all of the Design Team's models.

## S

SBIM – Simple Building Information Modeling

SBIM is a concept of producing a “light” model that can be used for simulating the building’s performance very early within the design process. SBIM is the process of modeling only the exterior envelope, and the interior volumes to produce a lean model that energy modeling software can use easily.

T

Telecommunications Drawings – Interim As-Built Documents

A complete current electronic CAD and PDF set of as-built Telecommunication drawing for Owner use in coordinating selection and procurement of telecommunications/data equipment.

**SBA FORM 191**

**BUILDING INFORMATION MODELING (BIM)**  
**PROFICIENCY MATRIX**

# School Building Authority of West Virginia

## BUILDING INFORMATION MODELING (BIM) PROFICIENCY MATRIX

Category	A - Physical Accuracy of Model	B- IPD Methodology	C - Calculation Mentality	D - Location Awareness	E - Content Creation	F - Construction Data	G - As-Built Modeling	H- FM Data Richness
<b>1</b>	Basic Model Geometry <small>Point Achieved 0</small>	A1 Creation of A BIM Execution Plan <small>Point Achieved 0</small>	B1 Basic Model Information Export <small>Point Achieved 0</small>	C1 Site Orientation <small>Point Achieved 0</small>	D1 Geometrically Correct Content <small>Point Achieved 0</small>	E1 Quantity Takeoffs <small>Point Achieved 0</small>	F1 Post Bid Model Documentation <small>Point Achieved 0</small>	G1 Space Management Data <small>Point Achieved 0</small>
<b>2</b>	Design Requirements <small>Point Achieved 0</small>	A2 Introduction of Structural and MEP Model <small>Point Achieved 0</small>	B2 IPD Integration <small>Point Achieved 0</small>	C2 Existing Environment Awareness <small>Point Achieved 0</small>	D2 Manufacturer's Specific <small>Point Achieved 0</small>	E2 Object Scheduling <small>Point Achieved 0</small>	F2 Coordination Modeling <small>Point Achieved 0</small>	G2 Asset Management <small>Point Achieved 0</small>
<b>3</b>	Design Side Collision Detection <small>Point Achieved 0</small>	A3 Model Managers Role Defined <small>Point Achieved 0</small>	B3 Interdisciplinary Calculations <small>Point Achieved 0</small>	C3 Global Accuracy <small>Point Achieved 0</small>	D3 Design Intent <small>Point Achieved 0</small>	E3 Material Procurement <small>Point Achieved 0</small>	F3 Recapturing Design Intent <small>Point Achieved 0</small>	G3 Manufacturer Specific Information <small>Point Achieved 0</small>
<b>4</b>	Model Accuracy Innovation <small>Point Achieved 0</small>	A4 IPD Methodology Innovation <small>Point Achieved 0</small>	B4 Calculations Innovation <small>Point Achieved 0</small>	C4 Location Innovation <small>Point Achieved 0</small>	D4 Content Innovation <small>Point Achieved 0</small>	E4 Construction Innovation <small>Point Achieved 0</small>	F4 As-Built Innovation <small>Point Achieved 0</small>	G4 FM Data Innovation <small>Point Achieved 0</small>
<b>BIM Maturity</b>								
Category	Points Achieved	BIM Maturity Score		BIM Standard				
A - Physical Accuracy of Model	0	<b>0</b>		BIM Score Between 0-12 = Working Towards BIM				
B - IPD Methodology	0			BIM Score Between 13-18 = Certified BIM				
C - Calculation Mentality	0			BIM Score Between 19-24 = Silver				
D - Location Awareness	0			BIM Score Between 25-28 = Gold				
E - Content Creation	0			BIM Score Between 29-32 = Ideal				
F - Construction Data	0							
G - As-Built Modeling	0							
H- FM Data Richness	0							

A-Physical Accuracy of Model		Examples	Illustration
<b>A.1</b> Pt Earned  0	<b>Basic Model Geometry</b> Project Name: Size: Cost:	Project "A" was completed using BIM software. The Architectural model was created with all of the walls, roofs, floors, windows, and doors as model components. The majority of the components used were out of the box, default components.	
	Description:		
<b>A.2</b> Pt Earned  0	<b>Design Requirements</b> Project Name: Size: Cost:	Project "C" used doors that had invisible solids that were based on the building codes that returned collisions when objects touched the invisible solids within the door.	
	Description:		
<b>A.3</b> Pt Earned  0	<b>Design Side Collision Detection</b> Project Name: Size: Cost:	Project "A" had scheduled collision reports run against the architectural, structural, and MEP models. These collision reports were then addressed at the next project meeting and removed or fixed within the model.	
	Description:		
<b>A.4</b> Pt Earned  0	<b>Model Accuracy Innovation</b> Project Name: Size: Cost:		
	Description:		

B-IPD Methodology		Examples	Illustration					
B.1	Creation of A BIM Execution Plan	Project "A" used a plan that was developed by the project team that showed how information was being shared and at what time of the project it was to be shared. It also defined the level of development for each of the objects within the different models.						
	<table border="1"> <tr> <td>Project Name:</td> <td></td> </tr> <tr> <td>Pt Size:</td> <td></td> </tr> <tr> <td>Earned Cost:</td> <td></td> </tr> <tr> <td>Description:</td> <td></td> </tr> </table>			Project Name:		Pt Size:		Earned Cost:
Project Name:								
Pt Size:								
Earned Cost:								
Description:								
0								
B.2	Introduction of Structural and MEP Model	Project "A" included a Structural and MEP model that allowed for the integrated design of the project. The models were used to coordinate information between disciplines.						
	<table border="1"> <tr> <td>Project Name:</td> <td></td> </tr> <tr> <td>Pt Size:</td> <td></td> </tr> <tr> <td>Earned Cost:</td> <td></td> </tr> <tr> <td>Description:</td> <td></td> </tr> </table>			Project Name:		Pt Size:		Earned Cost:
Project Name:								
Pt Size:								
Earned Cost:								
Description:								
0								
B.3	Model Managers Role Defined	Project "A" has all members of the design team assigning a model manager to the project. This role is the single point of contact for all model issues, whether validation of information, transfer of information, or support.						
	<table border="1"> <tr> <td>Project Name:</td> <td></td> </tr> <tr> <td>Pt Size:</td> <td></td> </tr> <tr> <td>Earned Cost:</td> <td></td> </tr> <tr> <td>Description:</td> <td></td> </tr> </table>			Project Name:		Pt Size:		Earned Cost:
Project Name:								
Pt Size:								
Earned Cost:								
Description:								
0								
B.4	IPD Methodology Innovation							
	<table border="1"> <tr> <td>Project Name:</td> <td></td> </tr> <tr> <td>Pt Size:</td> <td></td> </tr> <tr> <td>Earned Cost:</td> <td></td> </tr> <tr> <td>Description:</td> <td></td> </tr> </table>			Project Name:		Pt Size:		Earned Cost:
Project Name:								
Pt Size:								
Earned Cost:								
Description:								
0								

C-Calculation Mentality		Examples	Illustration
C.1 Basic Model Information Export (Discipline)	Project Name:	Project "A" has program calculations intended to verify the Program of Requirements as it pertains to square footage. There is calculation methodologies built in to the schedule to return a plus or minus for total program square footage.	
	Pt Size:		
	Earned Cost:		
	Description:		
0			
C.2 IPD Integration	Project Name:	Project "B" has an architectural model that helps to dictate the sizing of mechanical systems within the MEP model. These two models are also used to run energy simulation without the duplication of information from either model.	
	Pt Size:		
	Earned Cost:		
	Description:		
0			
C.3 Interdisciplinary Calculations	Project Name:	Project "B" also has a MEP model that responds to changes within the architectural model. As interior walls are moved within the architectural model, the MEP model will resize the rooms requirements for energy.	
	Pt Size:		
	Earned Cost:		
	Description:		
0			
C.4 Calculations Innovation	Project Name:		
	Pt Size:		
	Earned Cost:		
	Description:		
0			

D-Location Awareness		Examples	Illustration
D.1	<b>Site Orientation</b>		
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:	Project "A"'s model was generated on top of a civil survey that conveyed the proper location of the site. It also had defined project north and actual north layouts within the project.	
D.2	<b>Existing Environment</b>		
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:	Project "A" had all of the existing topographical information modeled.	
D.3	<b>Global Accuracy</b>		
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:	Project "A" had the proper latitude, longitude, and altitude defined within the architectural model. The coordinates of the model were then shared within all other models that were created from it. The coordinates of the model are also able to be shared outside of the design software with software such as energy modeling software.	
D.4	<b>Location Innovation</b>		
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:		

E-Content Creation		Examples	Illustration
E.1	<b>Geometrically Correct Content</b>	Project "A" had content created for it that was three dimensions and contained the proper size and shape of the component.	
	Project Name: Pt Size: Earned Cost: Description:		
0			
E.2	<b>Manufacturer's Specific</b>	Project "B" had content that was created specifically for this project based on manufacture's cut sheets. It contained for the most part the manufacture's model number, serial number, and size.	
	Project Name: Pt Size: Earned Cost: Description:		
0			
E.3	<b>Design Intent</b>	Project "B" had engineering content that changed size as the rooms and spaces changed during design. The components were also smart enough to return errors when industry norms were not being address when the content resized.	
	Project Name: Pt Size: Earned Cost: Description:		
0			
E.4	<b>Content Innovation</b>		
	Project Name: Pt Size: Earned Cost: Description:		
0			

F-Construction Data		Examples	Illustration
F.1	<b>Quantity Takeoffs</b>	Project "A"'s model was used to provide accurate model data for quantity takeoff. The numbers were used to produce estimates at different phases of the project. The final cost estimate was proven after bid to be within .2% accurate of the quantities.	
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:		
F.2	<b>Object Scheduling</b>	Project "B" has schedules directly within the model that show quantities of objects and materials. Those schedules were exported using IFC standards and brought into construction estimating software for inclusion with the construction estimate.	
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:		
F.3	<b>Material Procurement</b>	Project "C" had structural steel that was directly ordered from the structural model in conjunction with the architectural model. Mechanical ductwork was also ordered directly from the model using a 3D CAD format as a transfer medium.	
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:		
F.4	<b>Construction Innovation</b>		
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:		

G-As Built Modeling		Examples	Illustration
G.1	<b>Post Bid Model Documentation</b>	Project "A" has all of the post bid documentation existing within the model file itself. All RFI's and addenda were generated from the model.	
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description		
G.2	<b>Coordination Modeling</b>	Project "B" was used to generate the coordination models for the different trades. The coordination models along with the design models were used in the field for coordination and job meetings.	
	Project Name:		
	Pt Size:		
	Earned Cost:		
0			
G.3	<b>Recapturing Design Intent</b>	Project "B" from the above example then had the changes from the coordination models placed back into the design models for the architectural, structural, and MEP models. The design models were then checked for accuracy in calculations and sizing.	
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description		
G.4	<b>As-Built Innovation</b>		
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description		

H-FM Data Richness		Examples	Illustration
H.1	<b>Space Management Data</b>		
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:	Project "A" contained space objects that contained information on the occupants of each room, what department they worked for, the technology requirements, and the square footage for that space. It also contained engineering information regarding sizing of equipment and code requirements.	
H.2	<b>Asset Management</b>		
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:	Project "B" included schedules for all assets over \$5,000 and had a tagging system in place for all of those assets. Those assets were all made as components within the model.	
H.3	<b>Manufacturer Specific Information</b>		
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:	Project "C" had content that was created directly from the manufacturer's cut sheets along with including name, serial number, and were accurately model to represent the actual installed equipment or furnishings. All content was replaced after bid to reflect the content that was actually purchased.	
H.4	<b>FM Data Innovation</b>		
	Project Name:		
	Pt Size:		
	Earned Cost:		
0	Description:		

**SBA FORM 192**

**BUILDING INFORMATION MODELING (BIM)**  
**EXECUTION PLAN**

School Building Authority of West Virginia  
**BUILDING INFORMATION MODELING (BIM) EXECUTION PLAN**

By signature below, this BIM Execution Plan is herewith adopted and incorporated into the Agreement, dated \_\_\_\_\_, for Professional Design Services between \_\_\_\_\_ and the \_\_\_\_\_ County Board of Education.

\_\_\_\_\_  
County Board of Education Date

\_\_\_\_\_  
Construction Manager Date

\_\_\_\_\_  
Architect Date

\_\_\_\_\_  
Civil Engineer Date

\_\_\_\_\_  
Structural Engineer Date

\_\_\_\_\_  
Mechanical Engineer Date

\_\_\_\_\_  
Electrical Engineer Date

\_\_\_\_\_  
Plumbing Engineer Date

\_\_\_\_\_  
Additional Party as Needed Date

\_\_\_\_\_  
Additional Party as Needed Date

1. Overview

The intent of this BIM Execution Plan is to provide a framework that will let the owner, architect, engineers, and construction manager deploy building information modeling (BIM) technology and best practices on this project faster and more cost-effectively. This plan delineates roles and responsibilities of each party, the detail and scope of information to be shared, relevant business processes and supporting software. All text that is italicized is for illustrative purposes only and should not be construed as a formalized response to this execution plan.

2. Project Initiation

This section defines the Core Collaboration Team, the project objectives, project phases, and overall communication plan throughout the project's phases.

A. Project Information

<u>Project Name:</u>	
<u>Project Number:</u>	
<u>Project Address:</u>	
<u>Project Description:</u>	

B. Core Collaborative Team

<u>Contact Name</u>	<u>Role/Title</u>	<u>Company</u>	<u>Email</u>	<u>Phone</u>

C. Project Goals and Objectives

<u>Project Goal</u>	<u>Objective</u>	<u>Achieved if</u>	<u>Project Timeframe</u>

## D. Collaborative Process Mapping (Coordination Plan)

	<u>Owner</u>	<u>Architect</u>	<u>Consulting Engineers</u>	<u>Construction Manager/ Contractor</u>	<u>Commissioning Agent</u>
<u>Conceptualization/ Program of Requirements</u>	<i>Provide requirements related to form, function, cost and schedule</i>	<i>Begin design intent model with massing concepts and site considerations</i>	<i>Provide feedback on initial building performance goals and requirements</i>	<i>Provide feedback on initial building cost, schedule, and constructability</i>	<i>Provide feedback on advanced commissioning requirements</i>
<u>Criteria Design/ Schematic Design</u>	<i>Provide design review and to further refine design requirements</i>	<i>Refine Design Model with new input from Owner, Consulting Engineers, and Construction Manager. Conduct Reverse Phase Scheduling Activity</i>	<i>Provide schematic energy modeling and system iterations as Design Model continues to develop</i>	<i>Provide design review and continued feedback on cost, schedule, and constructability</i>	<i>Refine advanced commissioning requirements</i>
<u>Detailed Design/Design Development</u>	<i>Department design reviews. Final approval of project design and metrics</i>	<i>Continue to refine Design Model. Introduce consultants models and perform model coordination</i>	<i>Create Discipline specific Design Models. Create detailed energy model.</i>	<i>Create Construction Model for simulation, coordination, estimates, and schedule</i>	<i>Review design model for all disciplines</i>
<u>Implementation Documents/  Construction Documents</u>		<i>Finalize Design Model, Construction Documents, and Specifications</i>	<i>Finalize Discipline specific Design Models and Final Energy Model</i>	<i>Enhance Construction Model and perform final estimate and final construction schedule</i>	<i>Review design model for all disciplines</i>
<u>Agency Coordination/  Final Buyout</u>	<i>Assist with code compliance negotiations and permitting</i>	<i>Work with agencies on code compliances, plan acceptance and respond to construction RFI's</i>	<i>Work with agencies on code compliances, plan acceptance and respond to construction RFI's</i>	<i>Manage bid process, project buyout, and preconstruction RFI's</i>	
<u>Construction</u>	<i>Monitor construction and give input to construction changes and issues</i>	<i>Perform contract administration, update Design Model with changes</i>	<i>Assist with RFI's and update Discipline specific Design Models, field conditions, and commissioning</i>	<i>Manage construction with subcontractors and suppliers, inform changes to Design Model</i>	<i>Observe construction and perform advanced commissioning.</i>

### E. Project Phases / Milestones

<u>Project Phase / Milestone</u>	<u>Estimated Start Date</u>	<u>Estimated Completion Date</u>	<u>Project Stakeholders Involved</u>
<u>Conceptualization/ Program of Requirements Phase</u>			<i><u>Owner, Architect, Consulting Engineers, CM</u></i>
<u>Criteria Design/Schematic Design Phase</u>			<i><u>Owner, Architect, Consulting Engineers, CM, Commission Agent</u></i>
<u>Detailed Design/ Design Development Phase</u>			<i><u>Owner, Architect, Consulting Engineers, CM, Commission Agent</u></i>
<u>Implementation Documents/ Construction Documents Phase</u>			<i><u>Owner, Architect, Consulting Engineers, CM</u></i>
<u>Agency Coordination/Final Buyout Phase</u>			<i><u>Owner, Architect, Consulting Engineers, CM</u></i>
<u>Construction Phase</u>			<i><u>Owner, Architect, Consulting Engineers, CM, Commission Agent</u></i>

### 3. Modeling Plan

Advance planning around which models will need to be created during the different phases of the project, who will be responsible for updating models and distributing them, and predetermining the content and format of models as much as possible will help your project run more efficiently and cost-effectively during every phase.

#### A. Model Managers

Each party—such as the owner, architect, contractor, or sub-consultants—that is responsible for contributing modeling content should assign a model manager to the project. The model manager from each party has a number of responsibilities. They include, but are not limited to:

- Transferring modeling content from one party to another
- Validating the level of detail and controls as defined for each project phase
- Validating modeling content during each phase
- Combining or linking multiple models
- Participating in design review and model coordination sessions
- Communicating issues back to the internal and cross-company teams
- Keeping file naming accurate
- Managing version control
- Properly storing the models in the collaborative project management system

<u>Stakeholder Company Name</u>	<u>Model Manager Name</u>	<u>Email</u>	<u>Phone</u>

B. Planned Models

In the table below, outline the models that will be created for the project. List the model name, model content, project phase when the model will be delivered, the model’s authoring company, and the model authoring tool that will be used. For models that will not be used or created in your project, just leave the row blank, and add rows for model types you anticipate needing that are not already listed. The first line offers an example.

<u>Model Name</u>	<u>Model Content</u>	<u>Project Phase</u>	<u>Authoring Company</u>	<u>Authoring Tool</u>
<u>Architectural Model</u>	<u>Architectural objects, code information</u>	<u>Conceptualization / Program of Requirements Phase</u>		<u>Autodesk Revit Architecture</u>
<u>Civil Model</u>	<u>Topography, site utilities to within 5 feet of perimeter, hard and soft surfaces, other site objects</u>	<u>Criteria Design / Schematic Design Phase</u>		<u>Autodesk Civil 3D</u>
<u>Structural Model</u>	<u>Structural steel members, bearing and shear walls, analytical structural model, lintels</u>	<u>Criteria Design / Schematic Design Phase</u>		<u>Autodesk Revit Structure</u>
<u>Mechanical Model</u>	<u>Mechanical systems, equipment, load information, utilities within 5 feet of building perimeter</u>	<u>Criteria Design / Schematic Design Phase</u>		<u>Autodesk Revit MEP</u>
<u>Electrical Model</u>	<u>Electrical systems, equipment, load information, utilities within 5 feet of building</u>	<u>Criteria Design / Schematic Design Phase</u>		<u>Autodesk Revit MEP</u>

	<u>perimeter</u>			
<u>Plumbing Model</u>	<u>Plumbing systems, equipment, load information, utilities within 5 feet of building perimeter</u>	<u>Criteria Design / Schematic Design Phase</u>		<u>Autodesk Revit MEP</u>
<u>Construction Model</u>	<u>Scheduling information, sequencing information</u>	<u>Criteria Design / Schematic Design Phase</u>		<u>Autodesk Navisworks Manage</u>
<u>Estimate Model</u>	<u>Costing data, quantity takeoffs</u>	<u>Criteria Design / Schematic Design Phase</u>		<u>Autodesk Navisworks Manage</u>
<u>Coordination Model</u>	<u>Design Intent Models and Fabrication information</u>	<u>Construction</u>		<u>Autodesk Navisworks Manage</u>

C. Model Components

As an aid to usability during later phases of your project, specify what the content, level of detail, and file naming structure of your models should look like.

1. File Naming Structure

Determine and list the structure for model file names. The first line offers an example.

<u>File Names for Models Should Be Formatted as:</u>	
<u>DISCIPLINE-Project Number-Building Number.rvt (example: ARCH-20090001-BL001.rvt)</u>	
<u>Architectural Model</u>	<u>ARCH-</u>
<u>Civil Model</u>	<u>CIVIL-</u>
<u>Mechanical Model</u>	<u>MECH-</u>
<u>Electrical Model</u>	<u>ELECT-</u>
<u>Plumbing Model</u>	<u>PLUMB-</u>
<u>Food Service Model</u>	<u>KITCHEN-</u>
<u>Structural Model</u>	<u>STRUCT-</u>
<u>Construction Model</u>	<u>CONST-</u>
<u>Estimate Model</u>	<u>COST-</u>
<u>Coordination Model</u>	<u>COORD-</u>

2. Precision and Dimensioning

Models should include all appropriate dimensioning as needed for design intent, analysis, and construction. With the exception of the exclusions listed below, the model will be considered accurate and complete. In the table below, enter which items' placement will not be considered entirely accurate and should not be relied on for placement or assembly.

<u>Items that Will Not Be Considered Accurate for Dimensioning or Placement</u>
<u>Architectural –</u>
<u>MEP –</u>
<u>Civil –</u>
<u>Construction –</u>
<u>Food Service –</u>
<u>Structural –</u>

3. Modeling Object Properties

The level of property information in the modeling objects and assemblies depends on the types of analysis that will be performed on the model. See Section IV-A (Analysis Models) for the types of analysis that will be performed.

4. Modeling Level of Detail

Specify the level of detail in your models below. The level of detail can be defined by exclusions and/or by object size.

1. Exclusions: List the objects that will be excluded from the model in the table below.

<u>Items that Will Be Excluded from the Model</u>
<u>Architectural –</u>
<u>MEP –</u>
<u>Civil –</u>
<u>Construction –</u>
<u>Food Service –</u>
<u>Structural –</u>

2. Size: Any object smaller than [TBD] will not be included in the model.

D. Detailed Modeling Plan

For each phase of the project, the project team should create a detailed modeling plan, which should include the modeling objectives, models included, and the roles and responsibilities of model contributors. Model objectives and model manager roles and responsibilities by phase are outlined below.

1. Conceptualization / Program of Requirements Phase

1. Objectives: Provide initial design based on conceptual parameters established by the owner, ensure that code and zoning requirements meet project objectives, and establish a 3D reference point of model coordination. Provide Program of Requirements and all space considerations for reference in the model.
2. Model Roles: A model may or may not take shape during the Conceptualization / Program of Requirements phase. If a model is created, its role will be to depict the visual concept and general layout of the project along with space requirements.
3. Responsibilities: The architect's designated model manager will establish a baseline model to be used as the basis for other models. During the Conceptualization / Program of Requirement phase, the model managers from all parties will establish modeling standards and guidelines.

2. Criteria Design / Schematic Design Phase

1. Objectives: Provide spatial design based on input from the Conceptualization / Program of Requirement phase; provide initial design for building system and attributes including architectural, structural, and MEP; identify initial coordination issues between building systems; receive input from suppliers and fabricators regarding system cost, placement, fabrication and scheduling.
2. Model Roles: The Architectural model will show the general design and layout of the building structure and act as the baseline for all other subsystem designs, such as MEP and Structural models. The subsystem designs will be used to show the initial selection and layout of building components. The Architectural model and Consulting Engineers' model will be used to inform the Energy Models.
3. Responsibilities: Once the baseline conceptual structure has been created, the architect's model manager will send the model to the sub-consultants so they can develop their designs. The consulting engineers' designated model managers will audit and deliver the completed models to the architect's model manager. The architect's model manager will review the models to ensure compliance with the phase requirements. Once the models meet the requirements, the architect's model manager will link or combine cross-disciplinary models. The architect's model manager should coordinate with the consulting engineers' model managers to eliminate duplicate or redundant objects.

3. Detailed Design / Design Development Phase

1. Objectives: Provide final design of building and building systems; resolve coordination issues between building systems; provide a Construction model capable of analyzing schedule, cost, and constructability.
2. Model Roles: The Architectural model will continue to act as the baseline for all other subsystem designs. The subsystem designs will be modified accordingly to represent the enhanced design.
3. Responsibilities: The consulting engineers' model managers will use the Architectural model to revise and complete their designs. Once the models are complete, the consulting engineers' model managers will deliver their models to the architect's model manager. The architect's model manager will review the models to ensure compliance with the phase requirements. The architect's model manager will provide the construction manager's model manager with the Architectural model and the Consulting Engineers' models.
4. Implementation Documents / Construction Documents Phase
  1. Objectives: Finalize design of the building and all building systems, prepare documentation for agency review, and provide construction modeling that highlights constructability, trade coordination, and fabrication.
  2. Model Roles: All design models will be used to reflect the design. The models will then be used to generate the contract documents. The Construction model will be used primarily for estimating, scheduling, and constructability analysis.
  3. Responsibilities: The architect's and engineers' model managers will prepare contract documents for agency review based on the Design Intent models.
5. Agency Coordination / Bidding Phase
  1. Objective: Revise Design Intent models based on agency feedback on all models.
  2. Model Roles: The design models will be adjusted to reflect agency feedback. The Construction model will be enhanced and further used for estimating, scheduling, construction sequencing, trade coordination, and constructability analysis.
  3. Responsibilities: The architect's model manager will communicate agency comments back to the design team. The consulting engineers' model managers will revise their design models accordingly and submit them back to the architect. The architect's model manager will provide the construction manager's model manager with the Architectural model and the Consulting Engineers' models.
6. Construction

1. Objectives: Update Architectural and Consulting Engineers' models based on submittals, RFIs, or owner-directed changes; maintain the Construction model based on construction activities. The construction team will submit RFIs and submittals through the collaborative project management system.
2. Model Roles: The Architectural and Consulting Engineers' models will be revised throughout construction, based on owner directives and As Built comments. The models will always reflect the revised contract documents. The Construction model will be used for scheduling analysis, construction sequencing, and trade coordination.
3. Responsibilities: The architect's model manager will work with their consulting engineers to answer the RFIs and submittals and adjust the models accordingly. The construction manager's model manager will update the Construction model and will work with the architect to develop the Architectural and Consulting Engineers' models.

#### 7. Facility Management

1. Objective: Use the Architectural and Consulting Engineers' models for facility management, with the possibility of use in ongoing operations.
2. Model Roles: The Architectural and Consulting Engineers' models will be used to represent the actual assembly of the building from construction.
3. Responsibilities: The architect will deliver the models at the end of the project to the owner.

#### 4. Analysis Plan

By listing and specifying what types of analysis your project will likely require at the beginning of your project, you can ensure that your key models will include the relevant information, making the analysis easier and more efficient.

##### A. Analysis Models

Your project's scope of work may require performing certain kinds of analysis, such as the ones listed below, based on existing or specially created model(s). In most cases the quality of the analysis depends on the quality of the original model that the analysis is derived from. Therefore the project team member performing the analysis should clearly communicate the analysis requirements to the original model authoring team member.

##### 1. Quantity Takeoff Analysis

The objective of quantity takeoff analysis is to use modeling property data to automate or simplify the quantity takeoff process. This information from the quantity takeoff tool can then be imported or tied to cost-estimating software. In order for the quantity takeoff process to work seamlessly, the original modeling author will need

to include the relevant property information in the design and an agreement of modeled content communities to estimate.

2. Scheduling Analysis

Scheduling analysis lets the project team use the project model to analyze the timeline and sequencing for construction. This information can then be used to modify or adjust the construction schedule. Tools currently exist that allow project team members to visualize the construction over time, but no systems exist yet that interact automatically with scheduling tools.

3. Visualization Analysis

Visualization tools let the project team view the design or construction of the project in 3D, giving them a more accurate perspective of the end product.

4. LEED Rating/Energy Analysis

LEED (leadership in energy and environmental design) Rating/Energy Analysis tools help the project team evaluate the impact of design decisions on sustainability and energy consumption. This analysis model is usually based on the main Architectural model, after which material and building system inputs can be used to evaluate the project's sustainability and energy consumption.

5. Structural Analysis

Structural analysis tools use the model to analyze the building's structural properties. Structural analysis programs typically use the finite element method (FEM) to measure the stresses on all structural elements of the design. For structural analysis to work seamlessly, the original structural modeling tool needs to be compatible with the structural analysis tool, and the original structural model property data must include information about the structural elements.

B. Detailed Analysis Plan

For each type of analysis that may be performed for your project, list the models used for the analysis, which company will perform the analysis, the file format required for the analysis, the estimated project phase, and the analysis tool that will be used. If there are other special instructions associated with the analysis, mark the Special Instructions column and list the details in the Special Instructions table in the next section.

<u>Analysis</u>	<u>Analysis Tool</u>	<u>Model</u>	<u>Analyzing Company</u>	<u>Project Phase</u>	<u>File Format Required</u>
<u>Visualization</u>		<u>Architectural Model</u>			<u>.rvt/.nwf</u>
<u>Structural</u>		<u>Structural Model</u>			<u>.rvt/?</u>
<u>Quantity Takeoff</u>		<u>All Models</u>			<u>.rvt</u>
<u>Scheduling /4D</u>		<u>All Models</u>			<u>.rvt/.nwf/?</u>
<u>Cost Analysis /5D</u>		<u>All Models</u>			<u>.rvt/.nwf</u>
<u>Energy/LEED</u>		<u>Architectural Model</u>			<u>.rvt/.GBXml</u>
<u>Daylight/Lighting</u>		<u>Architectural Model</u>			<u>.rvt/.FBX</u>

C. Clash Detection Process

Clash detection analysis is done to check for interferences between the designs of one or many models. To reduce change orders during construction, clash detection should be performed early and continue throughout the design process. For clash detection to work properly your project’s models need to have a common reference point and they must be compatible with the clash detection tool.

5. Concurrent As-Built Modeling Plan

As-built modeling will be a collaborative effort between the Architect and consultants and the construction team. During the construction process, the design team will incorporate changes triggered by requests for information (RFIs), architect’s supplemental instructions (ASIs) and change orders in into the Architectural and Consultant models. At specified dates during the construction process, the construction team will provide the design team with necessary changes due to shop drawings, coordination drawings and change orders. As required, the completed form of the construction will also be verified at these specified dates using laser scanning. The design team will then incorporate the changes reported by the construction team into the Architectural and Consultant models. At the end of construction, it will be the updated Architectural and Consultant models that are used for facility management.

A. Construction Capture Schedule

<u>Event</u>	<u>Date</u>	<u>Parties involved</u>
<u>Construction Capture 1</u>		<u>Construction team, Design Team, [Laser Scanning]</u>
<u>Construction Capture 2</u>		<u>Construction Team, Design Team, [Laser Scanning]</u>
<u>Construction Capture 3</u>		<u>Construction Team, Design Team, [Laser Scanning]</u>
<u>Construction Capture 4</u>		<u>Construction Team, Design Team, [Laser Scanning]</u>

6. Collaboration Plan

Creating a collaboration plan early on—including defining permissions and file structures—will help team members efficiently communicate, share, and retrieve information throughout the project. It lets you get the most out of your collaborative project management system, saving time and increasing your ROI.

A. Document Management

A Collaborative Project Management system will have to be researched and agreed upon prior to start of project. The requirements of the Collaborative Project Management system are:

- Be web-based or web-enabled—so all relevant, authorized project team members can remotely access it.
- Accommodate different permissions profiles for different project team members.
- Allow communication through either internal messaging or system-generated email.

- Include document management capability that lets the project team create a customized and permission-based folder structure which offers upload, download, and version control capabilities.
- Include a viewer that allows the project team to view .dwg, .dgn, .plt, .dwf, .pdf, .tif, .jpg, .doc, and .xls files.
- Include construction management capabilities for the tracking of requests for information (RFIs), submittals, design review, meeting minutes, daily reports, issues, correspondence, and transmittals.
- Able to interact with the file folder structure in the document management section.
- Able to automatically accept raw data from the clash detection tool.
- Include bid management capability, and this bid management solution should allow the project team to post the contract drawings and specifications for viewing in the form of a Plan Room.
- Allow for cost management controls, and this cost management capability should include budgeting, contracting, change orders processing, and payments applications tracking.
- Allow the project team to run reports based on the information in the system.
- Allow for the workflow and routing throughout the document, construction and cost management components of the solution.

B. Document Management Solution

A document management solution will be provided by the owner. The document management solution that will be used is called [TBD]. The architect will setup the site and set up all permissions for the site. The architect will lead a training session for the entire project team on how to use the site. The site will be maintained from the signing of this document until the occupation of the building.