

SECTION TWO DESIGN REVIEW SECTION

2-100 DESIGN PROFESSIONAL SERVICES SELECTION PROCEDURES

(A) To ensure an equitable opportunity for all practicing design professionals, and in accordance with Arkansas Code Annotated § 22-2-101 et. seq., ABA has initiated the following procedures that shall be followed to select firms or individuals to perform professional services for capital improvement projects. All agencies except as exempted by law, are required to use the MSC.

(B) Agencies shall comply with the Department of Finance and Administration, Office of State Procurement guidelines and policies in the development of requests for qualifications, structure of evaluation committees and evaluation of responses in the solicitation, evaluation and selection of design professional under this section.

(C) Any reference to the words “the Section” within Section Two shall mean the Design Review Section.

2-101 SELECTION AUTHORITY SCHEDULE

(A) Agencies’ whose fund’s have been appropriated by the General Assembly to the Agency or appropriated to ABA for specific buildings within Pulaski County shall have the responsibility for selecting the Design Professional. Any questions regarding the interpretation of this method should be directed to the ABA Design Review Section.

(B) Agencies desiring to enter into a professional services agreement wherein the contemplated fee, exclusive of reimbursable expenses, are \$5000 or less, may contact any qualified provider without ABA approval and negotiate an agreement for the required services.

(C) Agencies desiring to enter into professional services agreements wherein the contemplated fee, exclusive of reimbursable expenses, do not exceed \$25,000, may utilize a purchase order for these services in accordance with Ark. Code Ann. §19-11-1012(b)(9)(A). Agencies may enter into such purchase order agreements without prior approval of ABA.

(D) Agencies desiring to enter into a professional services agreement wherein the contemplated fee, exclusive of reimbursable expenses, are more than \$5000 but \$25,000 or less, may solicit qualifications from 3 or more qualified providers without ABA approval. Agencies should review Ark. Code Ann. §19-11-801 before initiating the process. The following is the recommended process:

(1) Issue a letter of request to the selected firms describing the nature of the services desired, the description of the project contemplated and require interested parties to submit a statement of qualifications and or pertinent information;

(2) Form a selection committee to evaluate the qualifications of the respondents and select the firm or individual to negotiate with;

(3) Should negotiations for a fee of less than \$25,000 fail, Agencies may approach their next selection and initiate negotiations. If negotiations are unsuccessful with all respondents, the agency should determine to terminate the selection process and either re-evaluate the scope of

services required and begin this process over or move to the formal selection process described in this section;

(4) While these agreements (\$25,000 or less) are not submitted to ABA or DF&A for prior approval, Agencies must report the agreements to DF&A/OSP in accordance with their rules.

(5) While ABA approval is not required for contracts \$25,000 or less, Agencies can make a written request for ABA assistance in the selection process. (See §2-102 on the process of written requests.)

(E) Agencies desiring to enter into a professional services agreement wherein the contemplated fee, exclusive of reimbursable expenses exceeds \$25,000 shall follow the procedures described in § 2-102 through § 2-106.

(F) Selection of design professionals and consultants will be coordinated by the State Architect or State Engineer or designee depending upon their respective or related fields.

(G) Agencies desiring to enter into a sole-source professional services agreement wherein the contemplated fee, exclusive of reimbursable expenses exceeds \$5,000 shall follow the procedures established by DF&A/OSP. Upon DFA/OSP approval of a contract which exceeds \$25,000 in fees (excluding reimbursables), the Agency shall attach a copy of the justification and approval to the contract when submitting for ABA review.

2-102 AUTHORIZATION TO CONDUCT SELECTION

(A) Advertising shall not be implemented until approved by the Section. The Section shall assign the solicitation process the appropriate RFQ number for tracking purposes. This RFQ number shall be referenced on all documents and correspondence related to the selection process and shall be shown on the lower left-hand corner of the first page of the professional services contract. Any Agency requiring design professional services or other appropriate consultants, regardless of the nature of funding, shall submit by letter their intentions, and request "Authorization to Proceed" from the Section, providing the following information:

- (1) Agency name and project;
- (2) Location of project;
- (3) Description of services desired;
- (4) Source of funding;
- (5) Description of the work to be accomplished and approximate square footage where applicable;
- (6) Approximate time frame for the anticipated need to start and complete the project;
- (7) Agency Project Coordinator and telephone number.
- (8) Estimated cost of the construction project or estimated total fees that will be expended over the life of the contract.
- (9) Acknowledgement that the agency has the request for qualification (RFQ) document ready for distribution.

(B) Draft of advertisement, name of newspapers advertising in, and deadline for submitting advertisement. Notice shall be placed on the ABA website. Published notices shall run at least one (1) time. The date of publication shall not be less than one (1) week before the day fixed therein for the receipt of the responses. See 2-105 EXCEPTION.

(C) The draft advertisement should contain but not be limited to the following information:

- (1) Advertisement cost billing information from the Agency including the name, address, and phone number of the purchasing official to which all invoices should be submitted;
- (2) Notice to the Design Professional as needed (i.e.: Architects, Engineers, Environmental Consultants or specialized fields such as Electrical Engineers);
- (3) Name of the Agency, division, department and location of the project; and RFQ number;
- (4) A brief description of the project, including the approximate square footage for new construction or renovations and the desired services;
- (5) The desired deadline for responses to the request for qualifications;
- (6) Instructions for obtaining a copy of the Request for Qualifications package (i.e. website address, telephone number, contact name);
- (7) The name, address, and phone number of the Agency person to whom the responses should be directed.

2-103 PUBLIC NOTIFICATIONS REQUIRED

After approval by the Section to conduct selection procedures, the selecting Agency shall be required to publish a notification that Design Professional services are being solicited. A notice shall be published in at least one (1) statewide newspaper for each project pursuant to the advertisement criteria under §2-102(C). Agencies are encouraged to publish notification in other publications, including but not limited to newspapers or trade journals with general circulation in the county where the project will be located.

2-104 DESIGN PROFESSIONAL QUALIFICATIONS

The following are minimum qualifications required for Design Professionals desiring to contract for design services with the State:

(A) All Design Professionals shall demonstrate their capability to perform the design of the project to the satisfaction of the selection committee.

(B) All Design Professionals, except for geo-technical engineers, whether prime or serving as consultants to the prime, shall have in force professional and general liability insurance in the amounts shown in § 2-311 and § 2-312 and proof of compliance shall be attached to all standard professional services contracts.

(C) All Design Professionals, whether prime or serving as consultants to the prime, shall be licensed in their respective disciplines in Arkansas or shall be capable of being licensed and shall do so immediately in accordance with their respective licensing entities, if awarded the project. Bid documents shall not be released to bidders without Design Professional's Arkansas registration stamp or seal and signature as evidence of compliance.

2-105 RESPONDING PROCEDURES

Allow a minimum of one (1) week after the last advertisement ~~in~~ for the receipt of responses from interested design professionals. Responses shall be in writing and in the format stipulated in the RFQ, (FAX or telegram communications are not acceptable), and addressed to the Agency official identified in the RFQ document. EXCEPTION: Allow a minimum of not less

than two (2) weeks for projects that are large or complex and that might require the services of an out-of-state design or consultant firm.

2-106 SELECTION METHOD

(A) After the response period, the receiving Agency, if it decides to move forward, shall take one of the following actions:

(1) For design professional type services or single project contracts wherein the estimated construction cost is less than one million dollars (\$1,000,000), pursuant to Arkansas Code Annotated § 19-11-801 through § 19-11-805, Agencies may select a design professional from annual statements of qualifications on file with the Agency. Nothing in this policy shall prohibit an agency from conducting an individual solicitation for on-call services or single projects regardless of estimated cost.

(a) Agency shall issue a public notice of their intent to solicit annual statements of qualifications and performance data from interested design professionals in accordance with § 2-103.

(b) Agency shall maintain qualifications received on file for a period of not more than 12 months after closing date of solicitation.

(c) When an Agency has a need for design professional services, the agency shall notify the Section of the need and the type of services desired. The Agency shall select no less than three (3) qualified firms (or individuals) from the qualifications on file and shall submit the names of the firms (or individuals) selected for consideration to the Section.

(d) The Section shall review the list of consultants and the scope of the services desired to determine that the correct type of design professionals are being considered. Upon a favorable determination, the Section will issue a letter of authorization and the Agency may then proceed with the selection process. The Section may request additional information as necessary to conduct this review.

(e) Agency shall then evaluate the qualifications of the consultants and select the best qualified candidate capable of providing the desired services and negotiate a contract. The agency shall conduct oral interviews of all selected candidates prior to making the final selection.

(f) Agencies shall initiate a contract with the Design Professional and then submit it to the DFA/OSP for review, approval, and processing. Prior to final approval, DFA/OSP submits contracts and amendments for the Section to review which are under its jurisdiction. Agencies may request the assistance of the Section in the negotiation phase of the contract development.

(2) For project specific contracts wherein the estimated construction cost is over one million dollars (\$1,000,000) per project, Agencies shall select design professionals from qualifications received from a specific public notifications of request for qualifications.

(a) The Agency shall convene the Preliminary Selection Screening Committee. This Screening Committee shall be composed of no less than three (3) members from the particular Agency desiring design professional services. It is recommended members should have subject matter experience or expertise in the areas the project will affect, and/or financial management, contracting or experience managing construction or design professional services contracts.

(b) The Preliminary Selection Screening Committee shall meet at a designated time and place, and review all responses. There shall be no more than five (5) finalists selected. A minimum of three finalists may be selected for smaller, low budget projects (under \$5,000,000). The agency may request the assistance of the Section during the selection process. If requested, a Section representative will be assigned to the committee to guide the committee through the process but shall not vote. If five (5) or less firms (three (3) or less for smaller projects) respond, the Agency may submit a written request to the Section for a waiver from the pre-selection process provided the Agency agrees to interview all firms that responded. If only one firm responded, the Agency may submit a written request to the Section for a waiver of the pre-selection and interview process and may begin negotiations with the firm that responded to the advertisement. The Agency may also request authorization to begin the selection process over. Nothing shall prohibit an agency from interviewing more than the initial five (5) finalists, if the agency determines that is in their best interest to do so upon written approval of the Section.

(c) Upon completion of the pre-selection process, the committee chairperson shall complete the Design Professional Selection Tracking Form and return it to the Section with the following information: list of all responses received, list of respondents selected for evaluation, list of respondents selected for interview, and list of committee members.

(d) Within three (3) working days, the agency shall notify all responding applicants by mail of the selection results, naming the finalists selected for interview.

(e) The Final Selection Screening Committee shall be made up of the Preliminary Selection Screening Committee. While it is recommended that no substitution of members of the final selection committee occur, if more than 3 members served on the pre-selection committee, agencies may reduce the number to a minimum of 3 members. .

(f) The final selection shall be made by the Agency following the interviews and oral presentations from the finalists selected by the Preliminary Selection Screening Committee. Notice of said interviews shall be mailed to the finalists notifying the respective finalists of the time and location of the interview at least ten (10) days prior to the interview. Exception: Allow fifteen (15) working days for projects that are large or complex and that may require the services of an out-of-state design or consultant firm.

(g) Each finalist shall be given a specific time to make their presentation and a time schedule to follow. The order of presentations shall be determined by random drawing during the pre-selection process.

(h) Preliminary designs or suggested designs shall not be permitted during the selection process and shall be grounds for disqualification. However, audio/video presentations and boards may be used to help communicate that the firm understands the nature of the proposed project and unique design challenges that may be encountered.

(i) Nothing in the MSC shall be construed to prohibit an ABA representative from attending any pre-selection or final selection proceeding for the purposes of auditing the process.

(j) The Agency shall forward the name of the Design Professional selected to the Section within two working days after the final selection is approved by the Agency. This notification will become part of the permanent record and the Agency shall notify all finalist of the result of the

interviews. With the notification to the selected design professional, the Agency shall initiate a contract with the Design Professional and submit it to the DFA/OSP for review, approval, and processing. The DFA/OSP shall forward to the Section the contracts and amendments subject to ABA review. Agencies may request the assistance of the Section in the negotiation phase of the contact development.

(B) Agencies shall be responsible for maintaining a complete record of the selection process from initiation through execution of the contract and contract closeout. This record shall include copies of all qualifications, scoring, notes, and correspondence including the firms not selected for consideration. ABA is responsible for maintaining documents or copies thereof which have been submitted in the approval process.

(C) At the conclusion of the selection process submit to the Section a compact disk containing a copy of the initial request to begin the selection process, Section letter of authorization to proceed, the advertisement publication (tear sheet), a copy of the RFQ documents, one complete copy of each respondent's qualification package received and a copy of the completed ABA tracking form, and copies of all letters on notification. The professional services contract may not be approved until receipt of this information. To facilitate tracking, the contract shall reference the assigned RFQ number. The disk submitted to ABA should be labeled with the RFQ number and project name or type of services requested.

2-200 STANDARD FEE SCHEDULE FOR PROFESSIONAL SERVICES

The fees shown in schedule §2-211 are the maximum that will be allowed and are considered necessary for the performance of adequate professional services, unless exempted by law. Any increase beyond the scope of the fee schedule must be approved by the ABA Director if such increases are determined to be in the best interests of the state.

2-201 DESIGN PROFESSIONAL'S BASIC SERVICES DEFINED

(A) Basic services, when referred to in the following fee schedules, shall be defined as follows and include all the services of the architectural, landscape architect, civil, mechanical, electrical, and structural consultants under one (1) basic fee. For review of funding and Agency programs refer to §2-401 through 2-404.

(1) Estimate of probable construction cost. Provide a separate line item for each of the technical specification divisions.

(2) Perform life cycle cost analysis of building components and systems in accordance with the Arkansas Energy Office rules for Energy Efficiency for Public Buildings for new construction projects exceeding 20,000 SF and renovation projects exceeding 20,000 SF wherein the estimated construction cost exceeds 50% of the insured valued of the building.

(3) Schematic design, approximately 15% complete. (To be submitted to Agencies only for approval.)

(4) Design development, approximately 50% complete. Include an estimate of the annual operation costs and energy consumption of all utilities, using industry standard average energy use for the building type. (To be submitted to the Agencies only for approval.)

(5) Seismic Design as required for projects to comply with Arkansas laws and the current Arkansas Fire Prevention Code.

(6) Construction documents. 100% complete documents to be submitted to the Agencies for review and following the agency review, submitted on to the Section for review and approval. Include an up to date copy of the estimated annual operation cost and energy consumption submitted with the design development documents. Consumption data shall be expressed in terms of total BTUH/SF/YR for new buildings and additions over 20,000 SF and for renovations exceeding 20,000 SF wherein the estimated cost of the renovation exceeds 50% of the insured value of the building. For all other projects, Consumptions shall be expressed as total BTUH/YR for the affected work.

(7) Agency reviews as applicable, which includes but is not limited to, ABA, the State Fire Marshall, and the Arkansas Department of Health.

(8) Advertisement, bidding of project, and contract negotiations as required to conform to the project funding.

(B) Basic Services are also to include periodic construction observation (site visits) by the prime Design Professional and all consultants at key critical times, for that applicable portion of the work for which they are involved, during construction and construction administration, including:

(1) Contract, bonds, insurance requirements review, coordination of contract documents and processing to the Construction Section;

(2) Shop drawing and material submittal reviews by the appropriate Design Professional or consultant;

(3) Periodic observation reports, a minimum of one (1) per month, complying with § 2-1605, "Design Professional Observation Requirements", prepared by the Design Professional and appropriate consultants and furnished to the Agency and the Construction Section. Include sub-consultant site visit(s) and an observation report(s) which is provided with the prime design professional's observation report and certification of contractor's payment applications.

(4) The appropriate Design Professional or Consultant shall monitor and ensure that all Agency operations/orientation/training or equipment manuals, or all, are submitted, reviewed, approved and transmitted to the Agency. Acknowledgment of this transmittal shall be included in the final closeout documents.

(5) Receive for the Agency from the Contractor, "record" drawings and all project close-out items pursuant to §3-500 through §3-504 and prepare a compact disc containing the record documents.

(6) Follow up inspection by all parties within thirty (30) days prior to the expiration of the one (1) year Contractor's Warranty.

2-202 ARCHITECTURAL AND BUILDING RELATED ENGINEERING SERVICES FEES

(A) Fees shall be based on the Design Services Fee Schedule shown in §2-211. This fee schedule is to be used for all Architectural, Civil, Landscape Architecture, Structural,

Mechanical, and Electrical Design Professional Services. These fees shall be considered part of "Basic Services" for a project as defined in §2-201.

(B) Fee schedule shall be used to determine the base fee, which includes all consultants noted above, computed on the basis of the design professional providing all basic services, as defined in this Standards and Criteria manual, times a percentage of the total construction cost.

(C) Base fees shall include the "full services" (unless otherwise negotiated) of all normal consultants, i.e., civil, architectural, landscape, structural, mechanical, and electrical, per §2-201.

(D) Note: All standard professional services contracts, negotiated as a percentage of construction cost, shall pay compensation to the Design Professional on the basis of actual construction cost, including all negotiations and change orders through final acceptance and payments to the contractor. Estimated construction cost, as approved by the Agency, shall be used until the bids are accepted, or if the project is canceled.

2-203 OTHER DESIGN PROFESSIONAL SERVICES

For boundary or topographical land survey services refer to §2-207; for Geo-technical engineering services, refer to § 2-208; for environmental engineering services, refer to § 2-209; for interior design services refer to § 2-206; for seismic design fee allowance refer to §2-204 and for asbestos consultant fees refer to §2-210.

2-204 SEISMIC DESIGN FEE ALLOWANCES

(A) For projects requiring seismic design and certification to comply with Arkansas laws and the current Arkansas Fire Prevention Code, fees may be increased, with the approval of the Section, as follows:

(1) Arkansas Seismic Design Categories A, B, and C: Basic services as defined under §2-200, §2-201.

(2) Arkansas Seismic Design Category D: Multiply base fee only, up to 1.04, maximum.

(3) Arkansas Seismic Design Category E: Multiply base fee only up to 1.05, maximum.

(4) Where applicable, the multipliers may be used to compute the seismic design allowance in Seismic Design Categories D and E only. These allowances shall be listed under the base fee shown on the standard professional services contract under "Compensation" as: Seismic Design Fee Allowance, "Category D" (or "E") = \$ (Amount). Do not list as a combined fee.

(B) Compliance with all applicable seismic design building codes shall include all ABA defined structural and normal non-structural elements. Refer to § 2-900.

(C) Additional Services for Non-Structural Elements (All Zones). Earthquake resistant design of specific, "out-of-the-ordinary" items or equipment not listed, may require "additional services" on the standard professional services contract, unless otherwise negotiated, for these non-structural seismic design bracing details. These "additional services", may be negotiated on an hourly, lump sum, or percentage of construction cost agreement when approved by the Section.

(D) Additional Services for Dynamic Structural Analysis: Should dynamic structural analysis be required for the seismic design of a structure to meet all applicable building codes, this analysis shall be considered an "additional service" under the standard professional services contract or its attachment, unless otherwise negotiated. This expense shall not be incurred without the approval of the Section.

2-205 SPECIALIZED CONSULTANTS

Fees may be negotiated on a percentage of construction cost, lump sum, or hourly fee (not to exceed) agreement with approval by the Section. Specialized consultants could include the following specialized fields including but not limited to: acoustical, theatrical lighting, parking, food service, solar, computer, exhibit planners, building commissioning, graphic, geo-technical, testing, land surveying, and land planning. Include a line item for each specialized consultant's fee under "compensation" in the Professional Service Contract and list as "Additional Services-[TYPE OF CONSULTANT] Fees".

2-206 INTERIOR DESIGN SERVICES

A basic interior design service fee not to exceed ten percent (10%) maximum of the total cost of all furniture, draperies, equipment, fixtures, paintings, artifacts, and the like, including planning and observation of placement and installation of same, shall be used by all agencies. Extra services desired by the owner shall require prior approval by the Section. Include all "Interior Design Fees" under "compensation" in the Professional Service Contract and list as "Additional Services-Interior Design Fees".

2-207 BOUNDARY OR TOPOGRAPHICAL LAND SURVEYING SERVICES FEES

Boundary or topographical land surveys are considered a specialized engineering services and fees for these types of services shall be negotiated on an hourly not-to-exceed rate or a lump sum commensurate with the scope of the survey. Fees for this type of service require the approval of the Section. Prior to finalizing the negotiations, agencies shall submit a draft of the scope of the work and the proposed fee arrangement to the Section.

2-208 GEO-TECHNICAL ENGINEERING SERVICES FEES

Geo-technical investigations are considered a specialized engineering service and fees for geo-technical services may be negotiated on an hourly not-to-exceed fee or a lump sum agreement. If conditions are such that a lump sum (not to exceed) cannot be guaranteed, then a unit price per boring or trench may be included to cover the suspected conditions that may be encountered. Fees for this type of service require the approval of the Section. Prior to finalizing the negotiations, submit a draft of the scope of the work and the proposed fee arrangement to the Section.

2-209 ENVIRONMENTAL ENGINEERING SERVICES FEES

For projects involving purely environmental engineering services, excluding asbestos consulting services, independent of a new building construction project and where the services of the engineer are contracted directly to the Agency, the fees may be negotiated on a percentage of the construction cost, lump sum, or hourly fee (not to exceed) agreement with approval by the

Section. Prior to finalizing negotiations, submit a draft of the scope of the work and the proposed fee arrangement to the Section.

2-210 ASBESTOS CONSULTANT FEES

Asbestos inspection, design, air monitoring and project management services are considered a specialized consulting services and fees for these types of services shall be negotiated on an hourly not-to-exceed rate, a daily or abatement shift rate or a lump sum commensurate with the scope of the project. The Section shall approve fees for this type of service. Agencies shall submit a draft of the scope of work and the proposed fee arrangement to the Section prior to finalization of negotiations.

2-211 DESIGN SERVICES FEE SCHEDULE

(A) The following fee schedule for basic services as defined in § 2-201 is based upon a percentage of the total (final) construction cost including all adjustments (increases and decrease) by change order or negotiations and as modified by the footnotes at the bottom of this schedule. For projects less than \$50,000 or more than \$50,000,000, fees may be negotiated subject to ABA approval.

CONSTRUCTION COST	BASIC FEE
Less than \$50,000	As Negotiate d
\$50,001 to \$75,000	9.25%
\$75,001 to \$100,000	9.00%
\$100,001 to \$200,000	8.75%
\$200,001 to \$300,000	8.50%
\$300,001 to \$400,000	8.25%
\$400,001 to \$500,000	8.00%
\$500,001 to \$600,000	7.75%
\$600,001 to \$700,000	7.50%
\$700,001 to \$800,000	7.25%
\$800,001 to \$900,000	7.00%
\$900,001 to \$1,000,000	6.75%
\$1,000,001 to \$20,000,000	6.50%
\$20,000,001 to \$ 22,500,000	6.25%
\$22,500,001 to \$25,000,000	6.00%
\$25,000,001 to \$27,500,000	5.75%
\$27,500,001 to \$30,000,000	5.50%
\$30,000,001 to \$32,500,000	5.25%
\$32,500,001 to \$35,000,000	5.00%
\$35,000,001 to \$37,500,000	4.75%
\$37,500,001 to \$40,000,000	4.50%
\$40,000,001 to \$42,500,000	4.25%
\$42,500,001 to \$50,000,000	4.00%
Over \$50,000,000	As Negotiated

(B) Prior to applying any of the modifiers listed below, Agencies shall submit a request to the Section for authorization to negotiate a contract containing these modifiers. The request shall

include a description of the services to be added or deleted and the range the Agency intends to negotiate to.

(1) For simple projects such as warehouses, parking lots, parking decks, agricultural facilities or similar, deduct a minimum of 1% from the fees indicated.

(2) For projects involving the site adaptation of an existing design such as a standard bath house, employee residence, or similar, deduct a minimum of 2% from the fees indicated.

(3) For complex projects such as hospitals, medical or research facilities, laboratories containing extensive amounts of scientific equipment, add a maximum of 1.5% to the fees indicated.

(4) For projects involving the renovation of existing structures where accurate as-built information does not exist, add a maximum of 2% to the fees indicated to allow the design professional to survey the facility and develop accurate plans of existing conditions.

(5) For projects where more intense observation is required to ensure proper execution of the project such as but not limited to; installation of underground utilities, pouring of massive or structural concrete structures, add a maximum of 4% to the fees indicated. Agencies are encouraged to negotiate these additional fees on an hourly rate not to exceed the 4% maximum. These services shall be listed on the professional services under "compensation" as a separate line item entitled "Additional Project Observation".

2-300 PROFESSIONAL SERVICES CONTRACT DEVELOPMENT

(A) All professional service contracts and amendments shall be submitted on the forms developed and approved by DFA/OSP only. Attachments to these standard forms are permitted and encouraged. All attachments shall be edited to be in compliance with applicable rules and laws.

(B) Contracts may be amended to increase or decrease the fees, to add or replace sub-consultants or modify the terms and conditions at any time during the contract period and may be amended to extend the time annually until the project is completed. However, the contract may not be amended to extend the time beyond maximum limits for professional services contracts as established by laws and the DFA/OSP rules.

(C) All contracts and the selection of the design professional shall be only as approved by the Section , and must follow all ABA MSC rules and OSP rules regarding submission schedules, fees and reimbursable expenses for reporting and tracking unless exempted by law.

(D) All reports, studies, budget cost estimates and the like produced under these contracts shall be submitted to the Section for record in the same manner as plan reviews.

2-301 PROJECT SPECIFIC TYPE CONTRACTS

(A) Agencies are required to use a project specific contract for each capital improvement project where the estimated construction cost exceeds \$1,000,000 including contingency cost. These contracts shall not be amended to add additional projects or to increase the scope of the work to add or alter additional buildings, or to make additional improvement to site work or utilities beyond the original defined scope in the solicitation for design service.

(B) Fees for professional services under this type of contract are customarily based on a percentage of the construction cost as established in § 2-211. Fee arrangements other than a percentage fee require written justification submitted to the Section for approval prior to negotiating the contract. Additional services beyond the basic fee may be added as appropriate and as defined in § 2-200.

(C) Agencies may enter into design professional contracts for project specific type of contracts in which the project is less than \$1,000,000.

2-302 DESIGN PROFESSIONAL (MULTIPLE PROJECT TYPE) CONTRACTS

(A) In some instances, Agencies may elect to enter into a standard professional services contract with an architect, engineer, or consultant for multiple minor projects or minor projects which are time critical during the contract period. Do not use the phrases "Indefinite Delivery or Open End" when referring to these contracts. The use of these phrases implies that these contracts will not end. State contracts must have a finite term and cost. These types of contracts are referred to as design professional contracts as defined in Arkansas Code Annotated § 19-11-1001.

(B) These types of contracts are to provide professional services for small projects and additions, particularly renovation and maintenance type projects, that do not exceed \$1,000,000 in construction cost. These types of contract are also applicable for feasibility studies, programming studies, budget estimates, technical assistance, emergency damage recovery projects and other similar activities involving architectural or engineering expertise.

(C) Fees for each individual project under this type of contract should be based on a percentage of construction cost, lump sum, or an hourly (not to exceed) type contract. Detail statement of work documents or task order assignment documents should be developed for each assignment defining the scope of the assignment, fee arrangement, completion time and deliverables required from the consultant at the time of the project assignment. Fee payments should be closely audited to ensure they do not exceed the maximum allowable fee authorized by the assignment order. Terms for these contracts must remain the same for the duration of the contract period.

2-303 LUMP SUM OR HOURLY FEES (NOT TO EXCEED)

As an alternative to the fees as a percent of construction cost set forth in § 2-211, the Agency may negotiate a lump sum or hourly (not to exceed) fee contract, subject to approval by the Section. The lump sum or hourly (not to exceed) fee should be based on the estimated construction cost, which is applied the percentages set forth in § 2-211 or a lesser percentage figure may be used if the Agency determines that portions of the design work can be furnished by other qualified sources.

2-304 ADDITIONAL SERVICES FEES

(A) Fees for "Additional Services" may be based on lump sum or hourly (not to exceed), unit prices. "Additional Services" fees shall be agreed upon in writing prior to the encumbrance of expense.

(B) Multipliers for additional services may not be used in an attachment to a professional services contract or invoice for services unless approved by the Agency and the Section in the initial standard professional services contract. Design Professionals may include a "multiplier" only where "above normal and lengthy" coordination of the additional services of outside specialized consultants is involved and approved by the Agency. This multiplier shall not exceed 1.10 times actual cost and should be clearly stated in any invoices for payment.

(C) Multipliers shall not be applied to equipment, material, or incidentals furnished to complete a project. Only consultant or personnel charges are applicable.

2-305 MULTIPLIERS FOR REIMBURSABLE EXPENSES

(A) Certain contracts, such as the AIA Document, "Abbreviated" "Standard Form of Agreement Between Owner and Architect", provide for the use of multipliers when computing the expenses incurred by the Architect (Design Professional), his employee, or consultants. Multipliers shall not be used when submitting invoices without the written agreement of the Agency and the Section during the initial preparation of a standard professional services contract. Multipliers up to a maximum of 1.10 times actual expenses for the procurement, coordination, and review of the work required such as legal surveys, geo-technical services, specialized consultants requested by the Agency, and the like, may be used only if acceptable to the Agency and the Section, and are clearly stated and referenced to the standard professional services contract in an attachment.

(B) Reimbursable expenses for material items, printed materials, and reproduction of plans and specifications, testing lab fees, or Agency review fees shall not be billed or invoiced with any multipliers. Invoices are accepted for actual expenses incurred only. Expenses will not be accepted without an invoice.

2-306 ACCEPTABLE/ALLOWABLE REIMBURSABLE EXPENSES

(A) Certain expenses will be incurred during a construction project, which may need to be included in all standard professional services contracts and also included as allowances in the design professional's contract under "Reimbursable Expenses", such as:

(1) Reproduction of design and bid documents (blueprints, printing, electronic media, cost, and the like). NOTE: These expenses to the Agency are limited to those provided the review agencies during the design review phases of the project, the minimum number of set required to bid the project subject to approval of the Agency, and the minimum numbers of sets to be furnished to the successful contractor (§2-1603). This includes all bid documents, drawings, specifications, addenda, negotiated changes, and change orders. Sub-contractors and suppliers requesting additional copies shall be responsible for all printing and shipping costs. The Design Professional shall furnish documentation of all printing and delivery cost. Acceptable documentation for printing cost shall be an invoice on letterhead or business forms from an outside printing company or service. Invoicing for these services on the design professional's letterhead only is not acceptable.

(2) Land and topographical surveys.

(3) Geo-technical soils testing services and material testing (soils compaction, asphalt, concrete, and similar testing services).

(4) Agency review fees, (example, Health Department plan reviews.)

(5) Postage and delivery expenses (including overnight or priority shipping when authorized by the Agency) related to transmittal of submittal documents, contracts, pay applications, and correspondence related to the project or contract. Request for reimbursement of these expenses must be accompanied by a receipt from the provider or a photo copy of the envelop showing the address of the recipient and value of postage when using regular mail where a receipt is not otherwise rendered.

(B) Travel Expenses:

(1) Out of state travel expenses, including airfare, lodging, meals, ground transportation, parking and tolls, for in-state design professionals when specifically requested by the Agency. Reimbursement rates shall be subject to the guidelines published by DF&A for out of state travel by state employees.

(2) In state travel expenses, including airfare, lodging, meals, ground transportation, parking and tolls, for out of state design professionals and out of state specialized consultants when specifically requested by the Agency. Reimbursement rates shall be subject to the guidelines published by DF&A for out of state travel by state employees

2-307 UNACCEPTABLE REIMBURSABLE EXPENSES

(A) Professional service contract and/or invoices for services shall not list any of the following as a "Reimbursable Expense":

(1) Mileage to and from a project site at any time.

(2) Any other connected travel expenses such as meals, lodging, and parking (except for out-of-state travel when specifically requested by the Agency).

(3) Facsimile communications (fax).

(4) Long distance telephone expenses.

(5) In-house computer or CAD time or equipment expense.

(6) Telegrams.

(7) In-house printing or reproductions.

(B) This applies to all design professionals and consultants, including geo-technical consultants, whether in-state or out-of-state. These expenses are considered normal overhead costs covered in the contract agreement, and are not reimbursable expenses.

2-308 PROGRESS PAYMENTS TO THE DESIGN PROFESSIONAL (RENDERING OF COMPENSATION)

(A) While contract requirements may vary greatly, a mutually agreed upon Method of Rendering of Compensation shall be established in the standard professional services contract, under

Section V, "Rendering of Compensation", or in a separate attachment. Compensation may be paid monthly or in stages of completion, but compensation or invoices may not be paid or processed until an Agency has received that portion of work.

(B) In a normal, average construction project, compensation for services and reimbursable expenses may be paid at the end of the following stages:

(1) Schematic Design: Up to 15% of fee (after completion of the Owner/Agency Review).

(2) Design Development: Up to 50% of fee (after completion of the Owner/Agency Review, where applicable).

(3) Construction Documents: Up to 75% of fee (after completion of ABA Plan Review and approval).

(4) Bidding, Negotiations, Award, Contract Administration: Up to 80% of the fee (after issuance of notice to proceed).

(5) Construction Administration through the final inspection and final punch list preparation up to 95% of fee.

(6) Project Closeout: Up to 100% after processing final pay request and project closeout items (Maximum 45 days). (Refer to §3-500 through §3-600)

(C) Any supplemental contracts (such as AIA Owner/Architect Agreements) listed as an "Attachment" to the standard professional services contract shall agree as to language and intent for all compensation, reimbursables, multipliers, and the like, noted.

2-309 PROJECTS WITH FIXED LIMITS OF CONSTRUCTION COST

(A) Where applicable, the Agency and the Design Professional may jointly agree to a fixed limit of construction cost as a condition of a standard professional services contract between the Agency and the Design Professional (or on the project assignment form or letter for projects executed under multiple project type contracts). If such a fixed limit has been established, the Design Professional and the Agency will cooperate to mutually agree with the Section on contingencies for design, bid climate and price escalation, on building program scope, construction materials, equipment, component systems, and types of construction to be included in the contract documents.

(B) The fixed limit of construction cost shall be included with all plan review submittals to the Section. The fixed limit of cost shall be stated in bold letters on the cover sheet of all documents submitted for review. The cost shall be stated in the following manner, "FIXED LIMIT OF CONSTRUCTION COST = (enter dollar amount)." This statement shall be removed from the documents prior to publishing for bids. Budgetary concerns by all parties shall be resolved during program review and the schematic design phase, before the first plan review submittal to the Section.

(C) Where this fixed limit of construction cost is exceeded, the Design Professional shall, without additional compensation, modify the construction documents as necessary to comply with the fixed limit, if provided under the terms of the standard professional services contract.

2-310 PROJECTS EXCEEDING CONSTRUCTION FUNDING AFTER BIDDING

(A) When it becomes apparent, after bids have been opened and reviewed, that the project cannot be awarded because of budget overruns, and that bids exceed the maximum allowed for negotiations pursuant to Arkansas laws, the Design Professional shall initiate the following steps:

(1) Meet with the designated project coordinator of the Agency or campus to review bids, budgets, program, and Owner's needs, within seven (7) working days.

(2) Review project costs with bidders for areas of possible savings or cost reduction. Analyze areas of excessive cost.

(3) Review project with the Agency's Project Coordinator(s), the Section, and the Construction Section to resolve project status as quickly as possible.

(4) Modify bid documents as approved and directed by all parties and resubmit the bid documents to the Section for review, comments, and approval for re-bidding.

(5) Re-bid project. Coordinate bid date with the Construction Section.

(6) The Design Professional may be required to re-design the project for re-bid without additional compensation. Additional redesigns beyond one (1) re-bid may be eligible for additional compensation subject to the approval of the Section.

(B) Other than reimbursables for printing costs, no additional compensation for re-bidding will be allowed unless approved in writing by the Section.

2-311 OMISSIONS AND ERRORS IN CONSTRUCTION DOCUMENTS

(A) Omissions, or errors, or both in construction documents often arise from unrealistic project schedules, lack of communication, failure to coordinate, review, or edit construction documents accordingly, as well as many other shortcomings in the design and construction process.

(B) The Agency project coordinator should work closely with the chosen design professional to set realistic project schedules which allow time for review and coordination by all parties, particularly during the scheduled ABA plan reviews.

(C) Failure to include necessary construction detailing, lack of coordination in the architectural, civil, structural, mechanical, electrical, and other, portions of the drawings and specifications, may result in costly change orders.

(D) If these change orders are reasonably attributed in whole or part to errors or omissions on the part of the design professional or his consultants, the Design Professional shall without additional compensation (to the degree the change orders are responsibly required because of the errors and omissions of the Design Professional), correct or revise all errors or omissions in its designs, drawings, specifications and other services, and prepare construction change orders to effect corrective work. Good judgment and fair practice should be exercised by all

parties in making these types of decisions. The Section and the Construction Section will review all decisions respectively.

(1) An omission of an item (such as a flagpole inadvertently left out of a set of project bid documents) which would have otherwise been included in the base bid for the project should not be used to penalize the Design Professional. However, if remedial work to the landscaping or concrete paving is needed to allow for installation of the flagpole at a later, less opportune time in the course of construction, then the Design Professional may be held responsible for these remedial costs (assuming the Agency has reasonably documented this requirement during preparation of bid documents for the project).

(2) In general, when additional costs are incurred in a construction project, which are directly attributed to negligent errors or omissions or both on the part of the Design Professional, said Design Professional may be required to bear some or all of the costs for remedial work needed to correct these negligent errors or omissions. The Design Professional should work closely with the Agency and the General Contractor to ensure that all errors or omissions or both are corrected in a timely manner, before any remedial costs are incurred, to contain and reduce change order costs. Errors and omissions should be resolved between the Agency and the Design Professional whenever possible, and as quickly as possible.

(3) The Administrator of the applicable section(s), shall have the authority to settle or resolve disputes concerning errors or omissions in a set of bid documents prepared for any Agency project utilizing professional judgment and accepted standards of care required of Design Professionals.

(4) Any dispute involving negligent omissions, errors, or both not resolved by the Agency and the Design Professional shall be submitted to the Section. Either party may then request a conference review with the Section and the other party to attempt to resolve the issue. Request to the Section shall include but not be limited to a description of the omission or error, all documentation related to the item or items in question, copies of all meeting notes, and correspondence, or instructions referring to the issues in question. The requesting party shall copy all other parties on the request and documentation. All other parties shall submit a letter stating their position on the issue and any additional documentation related to the issue within 10 working days to the Section and copy all other parties. The Section will review the information provided and issue a letter of opinion within 15 working days (30 working days after receipt of the initial request) or request additional information from the parties.

(5) Change Orders required as a result of an error, omission, or both may not be eligible for Design Professional fee compensation. For omissions, the Design Professional may be assessed a percentage of the cost of the change order, subject to the Section approval as determined in § 2-312, to cover the additional cost of the work due to failure to include the work in the original bid package. For an error, the Design Professional may be assessed the full cost of the change order, not as punishment, but in fulfillment of the principal of betterment, that the owner should not be required to pay twice for the same element of construction.

2-312 DESIGN PROFESSIONAL'S LIABILITY INSURANCE

(A) The Design Professional shall carry professional liability insurance covering negligent acts, errors and omissions. Include a copy of the current certificate of insurance as an attachment to the standard professional services contract. The minimum policy value shall be \$500,000 except

that the value shall be increased to a minimum of \$1,000,000 for projects where the estimated construction cost is between \$5,000,000 and \$20,000,000. For projects exceeding \$20,000,000 in estimated construction cost, the policy value shall be a minimum of 5% of the estimated construction cost. The Design Professional may utilize a Project Specific Professional Liability Policy for projects exceeding \$5,000,000 in estimated construction cost. The Design Professional shall be required to disclose the size and nature of all pending claims against his liability insurance during the negotiation phase. The Design Professional shall maintain this insurance in force after the completion of the services under the contract for a period of one (1) year after substantial completion of the construction.

(B) Neither the Section's nor the Agency's review, approval, acceptance of, nor payment for, any of the services required shall be construed to operate as a waiver by the Owner of any rights or any cause of action arising out of the Contract. The Design Professional shall remain liable to the State for reasonable project costs, which are incurred by the State as a result of negligent acts, errors, or omissions, or both on the part of the Design Professional. This liability shall extend to the Prime Design Professional's subcontractors and consultants in the performance of any of the services furnished.

(C) The Design Professional may be held responsible for reasonable project costs resulting from its professionally negligent acts, errors, omissions, or other breaches of the applicable standards of care established by Arkansas laws or regulations. Liability may include, but not be limited to, the Design Professional's own cost of for labor and other in-house cost, any resulting Contractor Change Order cost including demolition, cutting patching, repairs, or modification of work that is already in place. The Design Professional may also be held responsible for any Contractor or Owner delays or damages, and any judgment, fines, or penalties, against the Agency resulting from the Design Professional's professionally negligent acts, errors, omissions, and other breaches of the applicable standards of care.

(D) However, the Design Professional may not be held responsible for the cost of the correct equipment or system which should have been originally specified, except that the Design Professional shall be responsible for any increased cost, whether the result of inflation, reordering, restocking or otherwise of incorporating the corrected work into the Contractor's Change Order

(E) Upon determination that there may be Design Professional financial responsibility involved, the Design Professional shall be contacted by the Agency. The Design Professional shall be advised of the design deficiency, informed that it is the Agency's opinion that the Design Professional may be financially responsible, and requested to provide a technical solution to the problem, including a cost estimate. The Design Professional shall be given the opportunity to take the measures necessary to minimize the consequences of such defects within a timely manner without jeopardizing the integrity of the project. The Agency Project Coordinator shall promptly inform the Section of the issue and shall keep the Section informed until the issue is resolved.

(F) If the Design Professional refuses to cooperate in the negotiations, the Agency shall have the right to proceed with the remedial construction and/or change order negotiations without the Design Professional. Disputes shall be resolved as set forth in the Standard Professional Services Contract.

(G) Alternatively, the Design Professional may discharge its financial responsibility through negotiations with, and direct payment to, the Contractor. This action must be participated in and approved by the Owner. Evidence of the Agency's participation and approval of these negotiations and a description of the corrective action and cost incurred by each party shall be reported in writing to the Section for record.

2-313 OTHER INSURANCE REQUIRED OF THE DESIGN PROFESSIONAL

(A) Prior to the start of any work under the Professional Services Agreement, the Design Professional shall provide to the Agency Certificates of Insurance forms approved by the State and shall maintain such insurance until completion of all work under the agreement.

(B) The minimum limits of liability shall be as follows:

(1) Workers' Compensation: Standard Arkansas Workers' Compensation Policy with statutory requirements and benefits.

(2) Employers Liability: \$100,000 minimum.

(3) Broad Form Comprehensive General Liability: \$1,000,000 minimum

Combined Single limit coverage. The State shall be named as an additional insured with respect to the services being provided. The coverage shall include but not be limited to premises/operations liability, Products and completed operations coverage, independent contractors liability, owners and contractor's protective liability, personal injury liability.

(4) Automobile Liability: Arkansas Statutory Limits

2-314 PROFESSIONAL SERVICES CONTRACT

(A) Selection of architect, landscape architects, interior designers, engineers, land surveyors, and other related building consultants shall be coordinated and verified by the Section. When the Agency has completed the selection process the agency shall prepare a standard professional services contract. All basic compensation items, compensation for additional services, and reimbursable expense items, shall be carefully reviewed by both the Agency and design professional before signing the standard professional services contract. The signature page of this form shall be the only signature page in the agreement. Delete or strikeout the signature pages from all attachments to avoid confusion. Upon request, the Section is available for contract draft reviews between the Agency and the design professional.

(B) For Compensation and Reimbursable expenses, see §2-200 et seq. and §2-300 et seq. Additional services of the Design Professional may be based on a percentage of construction cost, lump sum or hourly fee with a not to exceed amount stated on the contract.

(C) All standard professional service contracts and amendments shall be submitted to the DFA/OSP website. DFA/OSP will forward the contracts and amendments to the Section for review. Contracts or amendments expected to receive Legislative review must have attached appropriate information regarding the contract or amendment. Contracts shall also contain disclosure forms and documents pursuant to EO 98-04. Appropriate information includes but is not limited to: Agency name; project description; construction and Design Professional funds; #

of standard professional services contracts; identify Design Professional and the objectives and scope; Design Professional fees; estimated construction cost; contract control number; amendment compensation with explanation; Design Professional reimbursables with breakdown; contract extension date; name of the contractor; contract amount and change orders. Contracts shall be completed in its entirety prior to submission for review. Particular attention will be given to areas concerning "Calculations for Compensation" and "Description of Services to be provided.

(D) Failure to meet the DFA/OSP submittal schedule for review and approval can cause a delay of 30 days or more for legislative review. All standard professional services contracts \$25,000.00 or more require Legislative review. The standard professional services contract form takes precedent over any and all attachments regarding time, funds, and compensation.

2-315 ATTACHMENTS TO THE PROFESSIONAL SERVICES CONTRACT

(A) Agency and Design Professionals may wish to add attachments to the standard professional services contracts. These attachments may be used to clarify the extent of the professional services, either basic or additional, for the Agency and the Design Professional. When Agencies and Design Professionals wish to add attachments to the standard professional service contract, the following shall be done:

(1) Attachments shall be referenced Attachment "A", "B", "C", or "1", "2", "3" and the like, and referenced on the contract under "Objectives and Scope".

(2) Attachments shall be neatly typed additions or the Agency and Design Professional may choose to use the standard American Institute of Architects "Abbreviated Standard Form of Agreement Between the Owner and the Architect", the Engineers Joint Council on Construction Documents "Standard Form of Agreement Between Owner and Engineer", or other documents approved by the Section. (ABA neither endorses nor rejects the use of these documents.) If these documents are used, they shall be carefully edited to fully agree with the standard professional services contract, Arkansas laws and regulations including the MSC regarding allowable fees, compensation, multipliers, acceptable reimbursable expenses, and the like, and the services to be provided under the contract. Hourly rates and attachments shall remain in place for the duration of the contract, subject to annual or biennial review and negotiations. The language contained within the standard professional services contract shall take precedence over all attachments except the ABA "Basic Services Defined" attachment.

(B) In addition, the ABA "Basic Services Defined" (refer to § 2-201) shall be attached to, or added under the AIA contract, Article 12, "Other Conditions or Services." All contracts shall adhere to the ABA "Basic Services Defined" as a condition of the contract.

2-316 AMENDMENTS TO PROFESSIONAL SERVICES CONTRACT

(A) Any modification to an existing standard professional services contract requires the submission of an "Amendment" for approval by all parties, as per the original contract, including, but not limited to, changes in the project cost and scope of the project, fee or hourly rate adjustment, reimbursable expenses or additional services adjustments, contract extension, funding change (character code), and additional sub-consultants.

(B) The base fee in a standard professional services contract will normally remain constant for the duration of a project. However, if the funding or scope of the project changes significantly enough to reduce or increase the base fee allowed by the ABA Standard Fee schedule (see § 2-211), then the standard professional services contract shall be amended by both parties to reflect the new base fee agreement, and submitted for approval.

2-400 PROCEDURES FOR PROJECT DEVELOPMENT AND CONSTRUCTION **[INTENTIONALLY LEFT BLANK]**

2-401 INITIATION OF PROJECT

(A) Many projects begin with a needs analysis and planning for the acquisition of property or space to be developed or renovated. For major project, this process begins months or years before a budget and appropriation request can be prepared. In conjunction with the Department of Finance and Administration, the Section reviews the capital project appropriation requests submitted for funding each biennium. Often, these request are insufficient to cover the total cost of construction desired once funded and approved for bidding. The Section is available to assist Agencies in this long term planning phase to help ensure that adequate space or funding is requested.

(B) As a part of the needs assessment and budgeting process, agencies often conduct or have performed certain studies or exercises such as feasibility studies, building space or systems programming studies, financing and contingency budgeting. While some agencies may have adequately experienced staff to perform these initiatives, others may not. The Section is available to assist with these activities or to assist the Agency with the selection of outside consultants specializing in these types of services.

(C) An Agency may initiate a pre-design study before developing a capital project budget request or after the project has been funded. The intent of the pre-design study is to reduce the amount of uncertainty related to the scope of the project, identify major project/funding milestones, selection of the proper delivery method for construction, establish project costs, and project timelines. While it is best to conduct such studies before a budget request is finalized, there may be significant advantage to applying such studies to projects which have already been funded to ensure that the project remains in the existing budget, meets the minimum program needs and is executed in a timely manner. Pre-design studies may include but are not limited to activities such as project analysis, program analysis, site analysis, preliminary cost projections or existing budget analysis, operations and maintenance impact analysis, staffing analysis and development of preliminary scope of work for the design process. Agencies may utilize their own staff in the production of this study or may use outside consultants for all or part of the study. The Section is available to assist with these activities or to assist the Agency with the selection of outside consultants specializing in these types of studies. It is not necessary to use the same design professional who prepares a pre-design study to perform the design phase of the project. These activities can be mutually exclusive of each other. By the same measure, preparation of a pre-design study or other pre-design service does not exclude a design professional from seeking a contract for the design phase of the project.

(D) During the initial phase of the project design, Agencies shall review whether revisions to the Comprehensive Annual Financial Report (CAFR) should be made. Determinations of whether to add new asset equipment or remove old asset equipment from the report shall be made. In

addition the project plans and specifications shall designate how assets will be disposed of and who shall bear the responsibility of the disposition.

2-402 FEASIBILITY STUDY REQUIREMENTS

(A) A feasibility study may be required to determine the initial building program needs, property requirements, probable construction cost and site improvement costs. The study may include but not be limited to other non-construction cost such as financing cost, design service fees, equipment cost, furnishing cost, and contingency cost in order to determine if a project is economically feasible and if adequate source of funding is available.

(B) The feasibility study should determine site selection needs, such as property size, zoning, utilities, acquisition costs, floodplain management, drainage costs, environmental review, pedestrian and vehicular access, parking needs, and storage needs as applicable. Building size and area requirements for all functions including the electrical, lighting, heating, cooling, and building system requirements should be addressed. Estimated construction, operation, and utility costs based on square footage and specific development costs, should be computed. Operational and staffing cost for security, maintenance, janitorial and building operators should be included on a cost per square foot basis as a part of the study. The study should include a brief discussion of the requirements and possible solutions for each area along with a line item cost estimate for each area. Consideration should be given to future expansion capabilities in all cases. The feasibility study should be used as a basis to help establish funding and to guide the Agency's Project Coordinator in selection of, and directing the work of, the appropriate Design Professional.

(C) Design Professionals shall be selected in accordance with the MSC (refer to § 2-100 et seq.). The Agency shall obtain approval from the Section prior to initiating a feasibility study with outside consultants or design professionals.

2-403 PROGRAMMING

(A) Unless otherwise negotiated, basic programming costs for a project are not covered under basic services provided in a standard professional services contract. The Agency shall provide the Design Professional with a minimum program of all project requirements, including site and building requirements, a program of required spaces, their approximate size or square footage, and all needed functions required for the building or project site, including all basic electrical, lighting, heating, cooling, and building system requirements. This information should be provided prior to negotiating a contract with the Design Professional. Copies of this information shall be included in the plan review submittal to the Section for informational purposes.

(B) If the Agency cannot provide a minimum program as described above, the Agency may include under "Additional Services" to standard professional services contract, a "not to exceed" cost for programming. This should be invoiced per the number of actual hours spent in preparation of the program, up to the "not to exceed" cost stated in the contract. The Agency should only incur this expense with the approval of the Section.

(C) When programming is provided by the Agency, review and needed corrections and compilations to the overall building program for site analysis, the addition of circulation space, mechanical equipment space, ancillary and storage space, and the like, as well as review and coordination of all electrical, lighting, heating, cooling, and building system requirements, shall

be considered part of the Schematic and Design Development Phase furnished under basic services, unless otherwise approved by the Section. A copy of the program approved by the Agency Project Coordinator shall be included in the Plan Review submittal to the Section.

2-404 FINANCING AND CONTINGENCY BUDGETING

“Authorization to Proceed” with the project will be given to the Agency concerned, providing appropriate funding is available for the project. It is recommended that all cost estimates for construction, all projected building costs, and all methods of finance include a contingency fund. Contingency funds should be used to offset inflation, unforeseen expenses, and/or cost overruns on construction projects. Items that could or may be covered by a contingency fund are unexpected utility work or relocation, damaged roof decking replacement, rock excavation, and the like. Contingency funding normally should not exceed 10% and should depend on the cost and complexity of the project, with a proportionately smaller amount as project budgets increase. While 5 to 10 percent may be necessary on low cost projects, this percent may be excessive on higher cost projects (1-1/2 to 2-1/2 percent may be sufficient). Overall building budgets should be reviewed with the Section, and the Design Professional chosen to perform the work. Contingency funds are not set up to cover the cost of errors in design and construction by the Design Professional, or for lack of coordination on their part, which requires remedial work during completion of construction. Refer to § 2-311 for Errors and Omissions.

2-405 PROJECT COORDINATOR

(A) The Agency shall assign a Project Coordinator. Name and position of Project Coordinator shall be submitted to ABA, on a form approved by ABA, for record with the First Review submittal. Project Coordinator shall not be changed without written notice to the Section.

(B) The responsibilities of the Project Coordinator shall cover the following:

(1) Allow the Agency to work closely with the Design Professional.

(2) Cooperate with the Section in all design and budget decisions, including compiling and

approval of the Agency's program for the project and approval of the estimated construction cost at each plan review submittal.

(3) Help make decisions regarding programming and operational restraints to best benefit the Agency and to bring the scope of the project within the estimated construction cost as submitted by the Design Professional and approved by the Agency.

(4) Be aware of the project status at all times. Attend all meetings and keep records accordingly.

(5) Keep the Agency Director advised as to the project progress at all times.

(6) Maintain adequate records of the project for future use, including plans, specifications and record drawings.

(7) Serve as the Agency primary contact regarding all matters concerning the Capital Improvement Project.

(8) Pre-review all submittals from the Design Professional prior to forwarding to the Section for review. The Project Coordinator shall ensure that all submittals meet the project requirements as defined for the Design Professional and as required for an ABA submittal (refer to § 2-1500 et. seq.).

(9) The Project Coordinator shall forward all submittal data to the Section along with any comments or supplemental instructions issued to the Design Professional. If the Agency has no comments to forward, the transmittal letter should so note and should include a statement to the effect that the submittal generally meets the scope of the project as defined to the Design Professional and that the estimated construction cost is within the established budget for this project. Ensure that all submittals are forwarded to ABA in the order that meets the Agency's priority needs. This will prevent ABA from reviewing a low priority project that has been submitted directly by the Design Professional.

(10) The Project Coordinator shall receive and review all comments regarding the submittal review by the Section and shall be responsible for distribution of these comments to all appropriate parties. The Project Coordinator shall ensure that the Design Professional responds to all comments in writing and notify the Design Professional and the Section in writing if he disagrees with a comment or a response. Responses shall be included with the next submittal package. It is acceptable and encouraged to include the direct responses from the Design Professional to the ABA comments. It is the Project Coordinator's responsibility to ensure that each comment is addressed and to his Agency's satisfaction before submitting responses to the Section.

2-406 BUILDING CODES ADOPTED

(A) The adopted building code for State projects is the Arkansas Fire Prevention Code as adopted by the Arkansas State Police, State Fire Marshall's Office. Arkansas laws and ABA Minimum Standards and Criteria shall have precedence over the Arkansas Fire Prevention Code where they exceed the requirements of that code. All project designs shall comply with all Arkansas laws and the Arkansas Fire Prevention Code.

(B) Other codes, rules or standards may be applicable to a specific project. It is the Agency's and Design Professional's responsibility to determine all applicable codes for each specific project. A partial listing of the more common codes applicable to state agency projects can be found on the ABA website at "www.arkansasbuildingauthority.com".

(C) The Section shall reference these codes, State Law, and the ABA Minimum Standards and Criteria in its review of documents presented for review.

2-407 REGULATORY AGENCIES' REVIEW

(A) In addition to reviews completed by the Section, design professionals are encouraged to work closely with municipal building officials and/or fire chiefs throughout the planning stages of State funded capital improvements. It is recommended that such municipal authorities be given the opportunity to review such plans to coordinate zoning, parking, and street utility and fire department requirements (specific fire protection, building access, fire lane, and the like requirements). Special requirements may be needed according to available equipment and fire-fighting/emergency procedures. Coordination with and review by the local fire official is a mandatory requirement.

(B) The Design Professional shall be responsible for coordinating a project directly with these regulatory agencies, independently from the Section, allowing adequate time for plan reviews and approval before submitting final plans to the Section for review. The Project Coordinator shall submit copies of all regulatory review Agency comments, waivers, variances and instructions regarding the project, including local fire official reviews, with the ABA plan review submittal.

(C) The following is a partial list of the regulatory agencies mentioned above which have adopted design and/or construction standards and may require pre-construction plan review and approval. Design professionals should request copies of all acts, laws, and adopted standards from these individual agencies. This listing is not exclusive of any other Agency, which may under special circumstances exercise design authority.

(1) Department of Health:

(a) Division of Plumbing and Natural Gas (plumbing systems, domestic water, septic design, swimming pools, and the like);

(b) Division of Radiation Control & Emergency Management (X-ray, nuclear medicine, installation or safety evaluations);

(c) Division of Sanitarian Services (kitchens, restaurants, and the like);

(d) Division of Engineering (waste water systems, water systems and districts, cemeteries, swimming pools, and the like);

(e) Division of Health Facility Services (hospitals, health units, and the like).

(2) State Police: State Fire Marshall (fire code review, life safety, and the like);

(3) Department of Labor (elevator safety, including inclined stairway chairlifts and vertical wheelchair lifts, boiler inspection, industrial hygiene, OSHA reviews);

(4) Department of Environmental Quality: (Resources Conservation and Recovery Act of 1976 when Federal funding exceeds \$10,000; Storm Water Pollution Prevention Plan for disturbed sites in excess of 1 acre, asbestos issues and other required environmental reviews);

(5) Division of Services for the Blind of the Department of Human Services (vending facilities in state owned or leased properties);

(6) Highway and Transportation Department (highway access, right-of-way design). Contact local district headquarters' engineer;

(7) Office of Long Term Care within the Division of Medical Services of the Department of Human Services, (long term care facilities/nursing homes);

(8) Arkansas LP Gas Board (review/inspect rural installation of LP storage tanks and gas meters);

(9) Arkansas Industrial Development Commission, Energy Division, (Arkansas Energy Efficient Standards for New Building Construction);

2-408 UNACCEPTABLE DESIGN CONFIGURATIONS

(A) Certain configurations have proven too expensive or result in excessive maintenance activity or utility costs.

(B) These following configurations shall not be accepted for use in State owned building designs unless they are submitted for approval in writing to Section, prior to the schematic design review submittal to the Agency. A copy of the approval letter from the Section shall be included with the plan review submittal to the Agency and with the final submittal to the Section.

(1) Pedestrian or vehicular circulation (other than for maintenance) on roofs of habitable spaces or support spaces such as pedestal pavers, on a plaza, over occupied spaces, shall not be accepted.

(2) Sloped glazing (except for Greenhouses), such as ridge or sloped skylights, which increases heating and cooling capacity requirements.

(3) Rooftop mounted, heating or cooling units and associated piping and/or ductwork, which increases foot traffic, roof penetrations, maintenance requirements, and re-roofing costs.

(4) Seismic Design Upgrades for Existing Buildings in Seismic Design Categories D and E: Upgrades of existing structures involved in additions, alterations, or retrofitting in Seismic Design Categories D and E shall be submitted for approval prior to beginning Schematic Design. Design changes required by failure to follow this procedure shall be the responsibility of the Design Professional.

(5) Buildings located in the Floodplain: All additional design requirements associated with building in a Floodplain shall be submitted to the Section prior to beginning Schematic Design. The additional cost of design changes required by failure to follow this procedure shall be borne of the Design Professional.

(6) Air-conditioning systems which do not meet the requirements of the Arkansas Mechanical Code or the Energy Code for ventilation air. This includes systems which, when set to meet this standard, will be operating outside of their intended design parameters and will result in a reduced life expectancy for the equipment.

2-409 PHASED PROJECTS

(A) Where a project size or complexity requires funding in stages and takes many years to complete, the Agency and Design Professional shall take the following steps in ensure project completion in a timely and prudent manner:

(1) Be aware that future funding is subject to termination.

(2) Work to the budget established in the funding for each phase or portion of the project.

(3) Establish a building program for the established budget for each phase only.

(4) Base all work in the schematic design and design development and construction bid documents, for the funded portion of the project only. Do not obligate the Agency for design services beyond the project funding limits. Any authorization for Design Professional services beyond available funding must be approved in writing by both the Section and Agency officials.

(5) Do not bid or obligate funding for partial construction, such as slab work only, for a project, which will be unused, and of no value until future funding is established for completion.

(6) Coordinate project requirements as to master planning, funding, and program review in the Schematic Design Review Plan Review submittal to the Agency.

(B) Agencies are required to disclose the estimated cost, scope and timeline including all phases in accordance with Ark. Code Ann. §19-4-1402. When it is determined that a project will be constructed in multiple phases, the Agency shall submit a statement to ABA describing the estimated scope of the capital improvement project, a description of the estimated timeline for implementing each phase of the project, and a breakdown of the estimated cost of the total project showing each phase's cost. The statement shall bear the signature of the Agency Project Coordinator or other authorized Agency Official. This statement shall accompany the first submittal to the Section and shall be updated if the estimated scope, timeline or costs change prior to the approval to proceed with the first phase of the work. The statement shall be updated and re-submitted with each subsequent phase submitted for the Section review.

2-410 PROJECT SCHEDULE

(A) Prior to commencing the design work, the Project Coordinator shall submit to the Section a projected "Project Schedule" developed in conjunction with the Design Professional, which shall include the following anticipated dates:

(1) Date of schematic design plan review submittal to the Agency.

(2) Date of design development plan review submittal to the Agency.

(3) Date of construction document plan review submittal to the Agency.

(4) Date of 100% complete plan review submittal to the ABA Section.

(5) Dates for bidding and construction start and estimated completion date.

(B) Upon submittal of this schedule, the Section will assign a project number to the project. This number should be referenced on all correspondence and shown in a prominent location on the cover sheet of plans and specifications submitted for review. If the Agency desires to have this project number assigned at an earlier time for its internal tracking purposes, the Agency should submit a written request to the Section indicating the official title the project will be listed under, the name of the design professional (if known at that time), the estimated budget for the project, and a brief description of the project. For ABA tracking purposes, the name of the project shall remain the same through the completion of the construction phase of the project.

(C) When it becomes apparent that the schedule must be altered, the Project Coordinator shall submit a revised schedule to the Section immediately.

2-500 BUILDING COMMISSIONING

Commissioning is a systematic process of designed to ensure that building systems perform interactively according to the design intent and the Owner's operational needs. This is best achieved beginning in the design phase by documenting the design intent and continuing through construction, acceptance, and the warranty period with actual verification of performance, operation and maintenance (O&M) documentation verification and training of operating personnel. When properly performed, commissioning can often reduce the overall cost of a project, reduce the time required to complete a project, increase the quality of a project and increase the probability of a successful startup of a project. These cost reductions and quality improvements often exceed the cost associated with the commissioning process.

2-501 NEED FOR COMMISSIONING

(A) Today's buildings and our expectations in their performance are becoming increasing sophisticated. Like any sophisticated machine, a building should be set-up and balanced to operate properly and may require a periodic tune-up to remain operating at peak efficiency. Agencies are encouraged to consider the concept of total building commissioning on new construction projects and major renovations. Commissioning when applied from the beginning of the design process and continuing through the warranty period can result in projects that cost less to construct, startup with fewer problems, and have proper documentation for operations and maintenance. In many cases, the cost of the commissioning process is offset by a reduction in construction cost, change orders and startup problems.

(B) With utility cost and maintenance cost escalating at rates above the average rates of growth in the State's economy, reductions in operations and maintenance cost are an essential part of an agency's obligations to being a good steward of public funds. Commissioning can be a vital part of the process of controlling these costs within an acceptable limit. In many instances including existing buildings, the cost of the commissioning process can often be returned in 2 years or less with the reduction in energy cost alone.

(C) When agencies elect to pursue green building design certifications such as Leadership in Energy Efficient Design (LEED), Green Globes or similar certifications, these processes usually have a prerequisite requirement to perform fundamental commission and offer addition points toward certification for additional or total commissioning. These programs often require the commissioning for points to be conducted by an independent third-party firm.

2-502 TYPES OF COMMISSIONING

(A) Commissioning is a systematic process of ensuring that building systems perform interactively according to the design intent and the Agency's operational needs. This is achieved beginning prior to the design phase by documenting the Owner's program requirements. The process is continued through the design phase by documenting the design intent and through construction, acceptance and the warranty period with actual verification of performance, operation and maintenance documentation verification and the training of operating personnel.

(B) Re-commissioning is the process of re-verifying the performance of building systems that have been commissioned previously to ensure the systems continue to operate according to the design intent or current operating needs. Re-commissioning may be initiated periodically or in response to a building renovation or a change in building usage.

(C) Retro-commissioning is the process of commissioning existing building systems that were not commissioned when originally constructed. It is a process to ensure building systems perform interactively according to the design intent and/or to meet the Agency's current operational needs. This is achieved by documenting the design intent where possible and the current operational needs, measuring the existing performance, implementing necessary operational and system modifications followed by actual verification of performance, operation and maintenance documentation verification and the training of operating personnel.

(D) Testing, Adjusting, and Balancing (TAB) is a form of commissioning that can apply to mechanical and electrical systems in a building. TAB is routinely specified in the construction project as a portion of the mechanical work in the technical specifications sections. Many specifications require the TAB specialist to be the supplier of the air devices or the controls vendor. The intent behind this type of specification is to require someone with a working knowledge of the air devices or the controls to be the TAB technician. In this approach, the TAB technician is a sub-contractor that is not directly responsible to the Agency.

2-503 COMMISSIONING AGENT

(A) The relationship of the commissioning agent or the TAB technician to the Agency is critical to the success of the project. The commissioning agent should be under direct contract to the Agency and should act as the Agency's representative during the design and construction phases of the project. This direct relationship allows the commissioning agent to freely express ideas concerning design changes that will enhance the project goals and in reporting the correct status of the project construction and operation of the system components. During the training and documentation phase, this direct relationship allows the commissioning agent to objectively evaluate the training and documentation to ensure that adequate time and preparation is provided to meet the Agency's expectations. While many small projects may be adequately handled by the concept of a TAB technician as a sub-contractor even these types of projects may be better served by the inclusion of an independent commission agent.

(B) Commissioning agents are typically professional engineers who have developed the specialty expertise necessary to advise and evaluate construction for defects and omissions and to provide or oversee the startup and the testing and balancing of systems and components. Commissioning agents also understand the documentation necessary to properly own and operate a building and understand the technical and operational parameters of a building well enough to oversee the training of the Agency's operating personnel. While professional registration is not always a requirement or necessity; it is a desirable qualification when considering the total building commissioning concept. It is desirable to find a firm or team that contains professional representation in all of the critical building trades. Commissioning agents and TAB consultants shall be considered as specialized engineering consultants and as such shall be selected and contracted in the same manner as engineering consultants. (Refer to §2-100). The Commissioning Agent or TAB consultant should be selected before or at the same time as the building design team. The Commissioning Agent's contract and the Design Professional's contract should clearly define the role the agent will have as the Agency's representative.

(C) The building Design Professional's contract should clearly acknowledge the role of the Commissioning Agent. The Agency is responsible for coordinating the two contracts. To make one contract subordinate to the other would make the process less effective.

2-504 SUBMITTAL REQUIREMENTS

Commissioning plans and specifications that are developed as a part of a commissioning project must be submitted to the Section for review and approval prior to issuing to the construction contractor. Input from the commissioning agent during the design phase should be carefully documented to evaluate the validity of recommended design changes. These changes should be included in the plan review submittals under the heading "Commissioning Agent's Recommendations". The activities of a Commissioning Agent may affect the progress or schedule of the building construction project particularly where defects or omissions are discovered. The construction bid documents should acknowledge the presence of an independent commissioning agent on the project and should clearly define the role of the agent and the responsibilities of the contractor to the agent as an authorized representative of the Agency.

2-600 ASBESTOS SURVEYS AND MANAGEMENT PLANS

It shall be the policy of ABA that State owned buildings be surveyed for asbestos containing materials (ACM) before demolition or construction work begins or where otherwise required by State and Federal laws and regulations. Even if no demolition or construction work is planned; ABA encourages operators of state owned buildings to obtain a survey for asbestos. The survey report should be used to make building maintenance/service personnel or interested building occupants aware of the location and condition of the ACM. A management plan for each surveyed building should be developed in accordance with federal guidelines and industry practices.

2-601 ASBESTOS PROJECTS GENERAL

The Arkansas Department of Environmental Quality (ADEQ) regulates activities related to Asbestos Containing Materials (ACM). Refer to ADEQ Regulation 21 for the State's policy and procedures related to ACM. Inspection and design of abatement materials or projects shall be performed only by persons properly licensed by ADEQ when the activity or quantity of materials equal or exceed the limits regulated by the Department. Certain activities involving quantities below the ADEQ threshold may be regulated under OSHA regulations for worker protection. These activities must be performed by personnel properly trained and certified for this activity pursuant to Ark. Code Ann. §20-27-1001 et seq. It may be in the agency's best interest to have such activities performed by a licensed abatement contractor prior to the general construction activities.

2-602 ASBESTOS PROJECTS SUBJECT TO ABA REVIEW AND APPROVAL

(A) When an Agency contemplates an asbestos abatement project wherein a separate abatement contractor and the estimated cost of the abatement contract exceeds the limits shown in § 3-101, this type of project shall be considered a capital improvement project and shall fall under the jurisdiction of ABA.

(B) For stand alone type projects, plans and specifications (for the abatement project and the replacement materials) shall be submitted to the Section for review and approval. These projects shall be subject to the bidding requirements under Section 4.

(C) For projects wherein the asbestos abatement is included as a part of the general construction bid package, the plans and specifications must be submitted to ABA for review as a part of the general construction review documents and those services listed in above in (B) are applicable. The asbestos consultant should be under contract to the prime Design Professional as a sub-consultant.

2-603 ASBESTOS CONSULTANTS

Unless adequately trained, experienced, and licensed personnel are employed by an Agency, ABA recommends that private sector licensed asbestos consultants be utilized to survey, investigate, prepare abatement documents, and monitor abatement activities. Asbestos consultants shall be considered as design consultants and as such may be hired in accordance with §2-101 and State law governing procurement of consulting contracts. Asbestos consultants shall be licensed and bonded pursuant to Ark. Code Ann. § 20-27-1001 et seq. which mandates the Arkansas Department of Environmental Quality with the authority to license asbestos abatement consultants and asbestos abatement contractors as well as for certifying air monitors, contractor-supervisors, inspectors, management planners, project designers, and workers involved with demolitions, renovations, and asbestos-response actions.

2-604 PLAN REVIEW SUBMITTALS

For projects subject to ABA approval, before a bid date is provided, these documents shall be reviewed and approved by the Section. A designer who is properly licensed by ADEQ shall prepare the bid documents for asbestos abatement projects. The designer's license number must appear on the cover sheet for projects submitted for review.

2-605 PROJECT SUPERVISION AND MONITORING

Abatement contractor activities should be adequately supervised and monitored by the asbestos consultant. The frequency of inspections and type of air monitoring shall be as established by State and Federal laws and regulations. On abatement projects occurring in occupied buildings, supervision and monitoring of the abatement work should be more intense, as dictated by the particular project circumstances.

2-700 FLOODPLAIN MANAGEMENT PROGRAM STANDARDS

It shall be the policy of ABA and its Council to assure that all state properties coming under ABA jurisdiction shall comply with the Floodplain Management Program.

2-701 AUTHORIZATION

(A) The Section shall review all capital improvement projects to determine whether the proposed development will be reasonably safe from flooding. If the proposed site is within a flood prone area, a development permit shall be submitted and approved prior to releasing the project for bidding or construction.

(B) All requests to the Section for variance from these guidelines shall be submitted through the Arkansas Natural Resources Commission to the Federal Insurance Administrator. ABA shall provide all available technical assistance concerning the flood management program to all requesting state agencies. ABA shall cooperate with the Arkansas Natural Resources

Commission, the Federal Insurance Administrator and with all agencies in implementing an effective flood management program. Flood hazard boundary maps may be examined at ABA or the Arkansas Natural Resources Commission or in some cases, in the local Soil Conservation Service Office. Maps are also available at the FEMA website, www.FEMA.gov.

2-702 DEVELOPMENT SUBJECT TO PERMITTING REQUIREMENTS

(A) Developments subject to the ABA floodplain management program include but are not limited to; improvements to or new construction of buildings, structures, mining, dredging, excavating, drilling operations, filling, grading, paving, landscaping, or storage of equipment of materials.

(B) New project sites should be carefully selected to avoid development in a known floodplain, flood hazard area or wetland. Prior to selecting a site the Agency should review all available data and consult with the Section to minimize the impact of developing in a floodplain on the project.

(C) Renovation or alteration project sites should be reviewed to determine if the site is in a known floodplain. While interior renovations and roofing projects may not necessarily require a floodplain development permit, the expenditure of funds on projects located within a floodplain may not be a wise use of public funds. Additionally, if the project site is located in the floodplain, the Agency should discuss this finding with its insurance risk management representative to ensure that the existing facilities are adequately covered for flood damage or loss.

2-703 PROCEDURES

(A) Any Agency considering the development of any construction project or wishing to enter any existing structures in participation in the National Flood Insurance Program, shall adhere to the following procedures:

(1) Submit the exact location and a brief description of the project to the Section.

(2) The Section will locate the project on the applicable flood hazard boundary map and advise the submitting Agency as to whether:

(a) The project is not in a flood management area and they may proceed without further consideration of the ABA flood management program.

(b) The project is in a flood management area, but is a conforming use and they must comply with ABA flood management program guidelines.

(c) The project is in a flood management area and is a non-conforming use. In this case, the submitting Agency may relocate the project so that it does conform, or may apply for a variance using the procedures outlined in these standards.

(B) The Section shall review proposed development to assure that all necessary permits have been received from those governmental agencies from which approved is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972.

(C) Failure to comply with the provisions of the ABA floodplain management program may result in the loss of Federal or State disaster assistance for the recovery and reconstruction of flood damaged facilities. Furthermore, under circumstances of repeated loss, the Agency and the State may be denied Federal funds for other programs or activities.

(D) Agencies are encouraged to prepare, or have prepared, scaled maps of their campus or site showing all man made features and the boundary of any floodplain on the property. Where base flood information is available, the elevations of the base flood and existing structures should be noted. This information is critical in the planning of future developments at the site. If the Agency has such information prepared, a copy shall be provided to the Section for record.

2-704 PERMITS

(A) When an Agency proposes to develop property within the boundaries of the 100-year floodplain or an ABA designated flood hazard area, the Agency shall submit an application for a development permit on a form approved by the Section. The form shall include but not be limited to the following information:

- (1) Application number (Agency Project Number issued by the Section)
- (2) Date of application
- (3) Name of the Agency/Owner of the property
- (4) Address of the development site (or legal description if an un-developed site)
- (5) Type of development
- (6) Brief description of the development
- (7) Base flood elevation at the site
- (8) Elevation of the lowest floor of the proposed structure
- (9) Acknowledgement of attachments to the permit application
- (10) Typed name and phone number of the applicant and signature and date.

(B) The Agency should attach all information pertinent to the application that will support the application. Such attachments should include but are not limited to:

- (1) A copy of the FEMA map for the project site with the exact location of the project site marked.
- (2) Copies of other regulatory agency permits such as those required under Sections 401 and 404 of the Federal Water Pollution Control Act and Amendments.
- (3) Elevation Certificates
- (4) Certification of No Increase in the Base Flood Elevation or no rise certificate

(5) Flood-proofing certificate

(6) Certification for water supply systems, sanitary sewer systems and on-site waste disposal systems.

(7) Notification of the alteration or relocation of a watercourse.

(C) The Section shall review the permit application and approve or disapprove the application. Requests for additional information may be made in conjunction with the initial review of the application.

(D) If the application is approved, the floodplain administrator will issue a development permit for the design phase of the project. A copy of the permit shall be posted at the project site during the construction and available for review by ABA or any other regulatory agency during normal business hours at the site.

(E) At the completion of the project but prior to final acceptance, ABA will review the development site to verify compliance with the permit requirements. The floodplain administrator will sign off on the permit signifying that the development complies with the permit requirements. If non-compliant work or construction is discovered, the Agency shall make the necessary corrections for compliance or the project will be designated as a non-conforming use site under the ABA floodplain management program.

(F) In riverine situations, the Agency shall notify ABA, adjacent communities, and the State NFIP Coordinator at the Arkansas Natural Resources Commission prior to any alteration or relocation of a watercourse, and submit copies of such notifications to the Federal Insurance Administration. Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained. This assurance shall be accompanied by an engineering study of the before and after conditions and shall have been prepared by a registered professional engineer.

2-705 FEMA MAP DESIGNATIONS AND TYPES

(A) FEMA is the official source for all floodplain maps used in the ABA floodplain management program. FEMA began publishing flood hazard boundary maps for the United States in 1977. These early maps were constructed from information obtained from other sources such as the Army Corps of Engineers, US Geologic Survey Services, US Soils Conservation Service and other available sources. In some instances the data used to compile these source maps had not been updated in many years. In many parts of the State, these older maps are still the effective maps in use.

(B) FEMA regularly reviews these maps and will issue updated maps periodically when new or better flood study information is available. These maps will be designated by a community panel number and an effective date. Some maps will be designated as Flood Hazard Boundary Maps (FHBM), Flood Insurance Rate Maps (FIRM), Special Flood Hazard Areas (SFHA) or other designations.

(C) Maps are issued in several formats. Some older maps will be printed on ledger size paper (11"x17") and are commonly referred to as "plates". Larger format maps are printed and folded much like a road map and are commonly referred to as "panels". Newer maps are being issued

in an electronic format and are referred to as a “DFIRM” or digital map. Some maps are available for viewing and or purchasing at the FEMA website (www.fema.gov).

(D) Due to the methodology of producing the original maps and the incorporation of better information from actual field studies, sometimes property which is shown in a known floodplain may actually be at an elevation that is above the established base flood elevation. In these instances, the Agency or owner may submit an application to FEMA to have the property in question removed from the floodplain for insurance purposes. FEMA evaluates these applications and may issue a letter of map amendment (LOMA) or letter of map revision (LOMR). The actual map panel may not be redrawn to reflect this change until the next scheduled revision.

(E) Some maps or portions of maps will show a floodplain boundary but will not show the elevations of the base flood. In these cases, the Section may determine the approximate base flood elevation by one or more of the following methodologies; contour interpolation, obtain a base flood elevation determination from another authoritative source, review of high water marks from previous flood events, review of flood studies prepared by other government or private agencies. In the absence of a base flood elevation determination by FEMA, the Section determination will be the official determination for that specific site.

(F) Some maps or portions of maps will show a floodplain boundary with base flood elevation data but will not indicate a designated floodway. In these cases, the Section will use the established base flood elevations and may designate a portion of the floodplain as a floodway for the purpose of regulating the development in the floodplain. The area selected and designated a regulatory floodway shall be based on the principle that the area chosen for the regulatory floodway must be designed to carry the waters of the base flood, without increasing the water surface elevation of that flood more than one foot at any point in the floodplain. The ABA designated floodway will be the official determination for that specific project site.

(G) Some areas of the State have not yet been mapped by FEMA for flood hazard areas. When a project site falls within an unmapped area, the Section will determine if the project site is located within a potential flood prone or hazard area. When the project site is determined to be in a flood hazard area, the Agency shall be required to relocate the project outside of the ABA determined hazard area or to provide an engineering study to verify the site will not be in a 100-year flood hazard area.

2-706 GENERAL REQUIREMENTS

(A) Encroachment, including fill, new construction, substantial improvements, and other development are prohibited within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses, performed in accordance with standard engineer practice that the proposed encroachment would not result in any increase in flood levels within the floodway during the occurrence of the base flood discharge. Engineering analyses shall be prepared by a registered professional engineer.

(B) Except in unnumbered Zone “A”, until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted.

(C) Notwithstanding any other provisions, encroachment may be permitted within the adopted regulatory floodway that would result in an increase in base flood elevations, provided that the

requesting Agency first applies to FEMA for a conditional FIRM and floodway revision, fulfills the requirements for such revisions as established under the provisions of NFIP Regulations, Section 65.12, and receive the approval of the Flood Insurance Administrator.

(D) Construction of new structures or substantial improvements to existing structures are prohibited within the floodplain unless it has been demonstrated through hydrologic and hydraulic analyses, performed in accordance with standard engineer practice, that the proposed construction would result in an increase in flood levels of less than 1-foot within the floodplain during the occurrence of the base flood discharge. Engineering analyses shall be prepared by a registered professional engineer.

(E) Adequate drainage paths around structures on slopes are required within the floodplain to guide floodwaters around and away from proposed structures.

(F) New structures or modifications and equipment installed within a floodplain shall be installed using methods and practices that minimize the potential for damage or loss due to flooding.

2-707 ELEVATION REQUIREMENTS IN FLOODPLAINS

(A) Elevation of the lowest floor level for structures and the elevations of equipment pads for equipment located in the floodplain shall be as show in this paragraph.

(B) Where no FEMA map exists and the project site is located in a flood-prone area, the minimum elevation shall be 2 foot above adjacent grade.

(C) Where a FEMA map exists but no base flood elevation data is provided within 500 feet of the project site location, the minimum elevation shall be 2 foot above the base flood elevation established by ABA.

(D) Where a FEMA map exists but no base flood elevation is provided at the project site and a base flood elevation is noted within 500 feet of the site or a base flood elevation is obtained from another authoritative source such as a Corps of Engineers study or Highway Department study, the minimum elevation shall be 1 foot above the base flood elevation accepted by ABA.

(E) Where a FEMA map exists and a base flood elevation is provided at the project site, the minimum elevation shall be 1 foot above the elevation shown on the map, in the flood insurance study if available, or as interpolate between elevations shown on the map.

2-708 RECOMMENDED DEVELOPMENT TYPES IN A FLOODPLAIN

(A) While it is strongly desirable to prohibit development within the floodplain, ABA recognizes that there are beneficial developments that, when constructed properly, can provide vital public spaces while minimizing the potential for damage or loss due to flooding. Agencies are encouraged to reserve the floodplain for these uses to the maximum extent possible.

(B) When possible, floodplains at an Agency site or campus should be reserved for their natural purpose. Leave floodplains in their natural state as wildlife or bird habitats. Agencies shall maintain the floodplain and floodway in a manner that will reduce or minimize the accumulation of debris in the floodwaters, which may inhibit or restrict the free flow of the waters. When clearing or landscaping of a floodplain is necessary to reduce fire hazards, for safety and

security or to enhance the scenic view from a building or gathering point, the area located within the boundaries of the floodplain should be left as a green belt or space. Erosion control measures shall be implemented to ensure that flood events do not create erosion or unacceptable levels of sediment transportation.

(C) Development of walking, biking and riding trails within the floodplain particularly along the stream or river are encourage to allow the public to experience the beauty of these natural features. Amphitheaters and gazebos may be constructed within the floodplain provided that they are securely anchored to prevent floatation or collapse and are constructed of materials to resist flood damage. Agencies should emphasis the purpose of the floodplain and floodway through the use of informational and interpretive signs and exhibits.

(D) Sports fields and playgrounds may be constructed within the floodplain. Equipment installed must be properly anchored and constructed of materials that resist flood damage. Bleachers and stands may also be installed provided that they are properly anchored to prevent flotation, collapse and allow the free flow of floodwater through the structure. Concession stands that are enclosed on four sides must be elevated above the base flood elevation in accordance with § 2-706.

(E) Parking lots may be constructed within the floodplain provided no overnight parking is allowed at the site. Parking lot lighting must be installed on an elevated concrete pedestal with the hand-hole installed above the base flood elevation. All wiring shall be installed to prevent the entry of water into the conduit system. The electrical disconnect serving the lighting circuits must be installed above the base flood elevation and preferably outside the floodplain. Consideration to the anticipated velocity of floodwaters shall be considered in the selection of the paving system to minimize the loss of paving during a flood event. Provide adequate signage indicating that part or all of the parking is located in a known floodplain and that flooding may occur without warning during periods of heavy rainfall. Layout and location of signage must be included in the review submittal to the Section.

(F) Campsites and recreational vehicle parking may be constructed within a floodplain provided that the following conditions are met:

(1) Campsites may be constructed with permanent tent pads and accessories such as grilles, seating, fire rings and similar appurtenances. Campsites may be suitable for tents or pull along campers only. Tents and pull along campers shall be on site no more than 7 consecutive days and must be suitable for strike-down within less than 1 hour. No permanent cabins, lodges; or similar structures are allowed unless the lowest floor level is elevated above the base flood elevation in accordance with § 2-707.

(2) Recreational vehicles shall be on the site for fewer than 180 consecutive days and must be fully licensed and ready for highway use. A recreational vehicle is considered ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions. Vehicles not meeting these requirements must be installed to meet the elevation and anchoring requirements for "manufactured homes".

(3) Where overnight camping is allowed within a floodplain, the Agency shall have a written formal emergency plan for staff use in the notification of campers and the evacuation of the affected campsites. The Agency shall also install signage at each campsite advising the camper

that the site is located with a known flood hazard area and shall provide a clearly designate evacuation route to a safe location. Signage shall clearly mark the evacuation route and area of refuge. When campers check in at the campground, the Agency shall provide printed instructions on the evacuation procedures during flooding and shall provide the campers with a map showing the evacuation route, signage and area of refuge. Sign design and locations shall be indicated on plans and submitted for review.

(4) Agencies should also post warning signs at all locations within its property that may be subject to flash flooding regardless of whether the area is located in a known floodplain. Signage should advise that the area is known to be subject to flash flooding during heavy rains and that caution is advised during rainy weather. The signage should also provide directions to the closest exit from the flood prone area.

(5) Campsites and recreational vehicle parking may be provided with utility hook-ups such as electricity, water and sewer provided that these utilities are designed to prevent the entry of floodwaters into the piping systems. Electrical connections within the floodplain area shall have a disconnecting means located outside the floodplain or at an elevation above the base flood elevation and shall be accessible by the campground operators to disconnect power during flood events.

(G) Telecommunication towers, utility poles or towers, underground utilities and similar facilities may be constructed in the floodplain provided that facilities are designed to resist collapse due to floodwaters, are properly anchored and permit the free flow of water in and around the structures. For utility service lines such as water, sewer, gas, electric and similar, the piping system shall be designed to prevent the entry of floodwater.

2-709 STRUCTURES NOT PERMITTED BELOW THE BASE FLOOD ELEVATION

(A) Residential structures, institutional restrained occupancy facilities, hazardous materials storage, educational facilities, emergency services facilities and office buildings shall not be constructed with the lowest floor below the base flood elevation.

(B) Water treatment and sewage treatment plants shall not be constructed with the lowest floor or operations level below the base flood elevation. When topography requires that such facilities must be constructed below the base flood elevation, the facility shall be protected from flooding by the use of levees or floodwalls and provided with reliable means to remove rain water before over topping the critical treatment tanks or structures.

(C) Where these types of structures must be located within a floodplain, the Agency must elevate the building or equipment pads above the base flood elevation by installing suitable fill. This installation must comply with the provisions of paragraph 2-706.

(D) The Agency may make application to FEMA for the site to be removed from the floodplain based on this fill activity. If FEMA approves the application they will issue a letter of map amendment based of fill (LOMAF). A copy of this letter must be submitted to the Section before the plans can be approved for bidding or construction. Note that this approval is for insurance purposes under the National Flood Insurance Program only and may not result in a premium reduction under the current State master insurance policy. The Agency shall verify the insurance requirements and restrictions with its insurance risk management representative.

2-710 STRUCTURES THAT MAY BE PERMITTED BELOW THE BASE FLOOD ELEVATION

(A) Non-residential structures may be permitted if dry flood proofed or wet flood proofed subject to the Section approval. Types of structures that will be considered include but are not limited too, picnic pavilions, park restroom facilities, parking garages, boat storage, marine dock facilities (including dock-mounted stores).

(B) For dry flood proofing, the structure and attendant utility and sanitary facilities, shall be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. The elevation of the dry flood proofing must be equal to the elevations noted in § 2-707, certified by the design profession and documentation submitted to the Section for review and approval.

(C) For wet flood proofing of new construction and substantial improvements, fully enclosed areas below the base flood elevation which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must be certified by a registered engineer or architect and meet or exceed the following minimum criteria;

(1) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodways.

(2) Automatic vents and screens must be periodically inspected and tested to ensure proper operation during a flood event. The Agency shall maintain a record of each test procedure and result along with maintenance records on the automatic type vents.

(3) Structure shall be constructed with materials resistant to flood damage and allow for quick sanitary cleanup and return to service. Materials that support the growth of mold shall be prohibited.

(D) Structures shall be adequately anchored to prevent flotation, collapse, or lateral movement of the structure or equipment resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy and velocity of the water. The potential for debris impact must also be considered as well as the probability for the structure or contents becoming debris for downstream property. Designs for meeting this requirement must be certified by a registered engineer or architect.

(E) Facilities shall be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding. Designs for meeting this requirement must be certified by a registered engineer.

2-711 MANUFACTURED HOMES AND PORTABLE BUILDINGS

(A) Manufactured homes or portable office or classroom buildings should not be located in a floodplain if other property at the site or campus is outside of the floodplain. When these types of structures must be located in a floodplain, the Agency may raise the grade on which the structure sits and the surrounding grade to meet or exceed the base flood elevation.

(B) The chassis shall be supported by reinforced concrete piers or other foundation elements of equivalent strength and shall be no less than 36 inches above the base flood elevations and be secured to an adequately anchored foundation system to resist floatation, collapse, and lateral movement. All mechanical and electrical equipment (including ductwork) shall be installed in accordance with paragraph 2-710(E).

(C) When an existing manufactured home or portable building which has been located below the base flood elevation has incurred "substantial damage" as the result of a flood, it shall not be replaced or repaired unless the provisions of paragraphs 2-711(A) & (B) are met.

2-712 UTILITY AND SITE IMPROVEMENT PROJECTS

(A) All public utilities and facilities, such as sewer, gas, electrical, telecommunication, water systems, and roadways shall be located and constructed to minimize or eliminate flood damage.

(B) Adequate drainage shall be provided to reduce exposure to flood hazards around these facilities.

(C) New and replacement sanitary sewage systems shall be designed to minimize infiltration of floodwaters into the systems and discharges from the systems into waters.

(D) Onsite waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

(E) Roads and driveways for normal access may be constructed below the base flood elevation as the topography may require. Roads and drives required for access by emergency vehicles during a flood for evacuation or emergency rescue or response shall be constructed at or above the base flood elevation.

(F) Bridges and crossings of streams, creeks and primary drainage paths of floodwaters may be constructed below the base flood elevation provided that proper signage is installed advising of "low water crossing, do not enter when water is above roadway". Construction must be in compliance with paragraph 2-706 and other applicable paragraphs of the ABA floodplain management program.

2-713 VARIANCE

(A) The issuance of a variance is for floodplain management purposes only. Insurance rates are determined by statute according to actuarial risk and will not be modified by the granting of a variance. Therefore, while a variance initially offers relief to a developer Agency, for example, though lower construction costs, higher insurance premiums may offset or exceed the reduced cost of construction. The ABA Council, after examining the applicant's hardship, shall approve or disapprove a variance request. While the granting of variances generally is limited to a lot size less than one-half acre, deviations from that limitation may occur. However, as the lot size increases beyond one-half acre, the technical justification required for issuing a variance increases. Variances may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or a State Inventory of Historic Places, without regard to the procedures described in this section.

(B) If an Agency wishes to construct a non-conforming structure in a flood management area, that Agency shall:

(1) Submit a description of the proposed project in enough detail to allow consideration of the eleven variance factors listed below.

(2) Submit a written detailed response to each of the variance factors listed below. ABA will consider the variance in conjunction and either disallow the variance, thereby requiring that the project be relocated, or submit it to the Council for consideration:

(a) Danger to life and property due to increased flood heights or velocities caused by non-conforming structure.

(b) Danger that materials may be swept downstream and cause injury to persons or property.

(c) Ability of any proposed water supply or sanitary systems to prevent disease, contamination, and unsanitary conditions.

(d) The susceptibility of the proposed facility and its contents to flood damage and the practicality of plans to prevent such damage.

(e) Importance of the proposed facility to the state or local community.

(f) Degree of necessity that the proposed facility be placed in this location.

(g) Availability and practicality of alternate locations.

(h) Compatibility of the proposed facility with existing development.

(i) Relationship of the proposed facility to the comprehensive plan and floodplain management program for the area.

(j) Safety of access of the facility in times of flood, particularly for emergency vehicles.

(k) The expected heights, velocity, duration, rate of rise, and sediment transport of the floodwaters expected at the site.

(C) Procedures for the granting of variances are as follows:

(1) Variances shall not be issued by the Council within any designated regulatory floodway if any increase in flood levels during the base flood discharge would result;

(2) Variances may be issued by the Council for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, in conformance with the ABA floodplain management program requirement;

(3) Variances shall only be issued by the Council upon:

(a) A showing of good and sufficient cause;

(b) A determination that failure to grant the variance would result in exceptional hardship to the applicant; and

(c) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing State or Federal Laws.

(d) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

(D) ABA shall notify the applicant in writing that:

(1) The issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 annual premium for \$100 of insurance coverage; increased deductibles per claims and in some instances, insurance coverage may be denied.

(2) Such construction increases the risk to life and property.

(3) Any terms or conditions of the variance approval.

(4) This information constitutes notification to the applicant of the criteria for and consequences of the issuance of the variance.

(5) ABA shall maintain a record of variances and report the number of variances to the Federal Insurance Administrator when requested.

2-714 REPORTING A FLOOD EVENT

To provide for effective management of floodplain development, it is essential that ABA be informed about each flood event in sufficient detail to plan future developments and adjust the floodplain management program. Therefore, agencies shall report each flood event to the ABA designated floodplain administrator and to its respective insurance risk management representative. The report shall include but not be limited to the following items:

(1) Date of the flood event.

(2) Rainfall in inches and duration of rain in hours (if known).

(3) A description of the damage to structures and facilities (include photos).

(4) A map of the campus or site showing the boundaries and elevations of the flooding at high water. If a map is not available, mark the high water at 100-foot intervals along the perimeter and on structures that were partially flooded and notify ABA. ABA will attempt to locate a suitable map and assist the agency with this documentation.

(5) Attach copies of news articles or reports that indicate the magnitude of the flood. If an authoritative source such as the Corps of Engineers or National Weather Service designates the event as a particular frequency event such as a 25 year, 50-year, 100-year event or similar, include a copy of this information.

It is not the intent of this policy to inhibit an Agency's response to or recovery from a flood event. This report should be completed after the emergency is over and submitted no later than 60 days after the event. However, an Agency may request a 30-day extension if submitted in writing. The request should include the date of the event brief description of the damages and the estimated date the full report can be submitted.

Once an insurance settlement has been determined, the Agency shall submit a supplement to the report noting the value of the total losses and the amount of the insurance settlement. This information is requested for tracking purposes only.

2-800 ENERGY CONSERVATION

(A) The life cycle cost of operating a building, including energy cost and labor cost, can often exceed the cost of the building construction by 8 to 10 times. Efforts to reduce energy consumption or improve employee efficiency by as little as 10% can often result in lifetime cost savings equaling the cost of new construction. It is therefore incumbent upon each building operator, manager, and designer to be aware of the issue regarding energy consumption in the building and to plan construction and operations as wisely as possible to minimize the energy consumption while meeting the operational needs of the facility and while promoting a healthy indoor environment.

(B) Energy Conservation for only the sake of avoiding energy consumption can often lead to indoor environmental problems that can have a potential cost far greater than the value of the energy saved. All energy plans should consider not only the energy reduction but also the impact upon the building materials, systems and upon the occupant's health and productivity. Pursuant to the Arkansas Energy Code and the Arkansas Fire Prevention Code, all new construction projects and renovations shall comply with these codes. Agencies should give careful consideration to the principles of the standards and codes for incorporation into the project design to allow a stable base from which the building operator can begin to manage the building's energy consumption. All occupied buildings shall be designed to maintain the indoor environment within the parameters of the "Comfort Envelope" as defined in the ASHRAE Fundamentals Handbook. This envelope defines a range of temperatures and humidity levels that are deemed to be acceptable to most occupants under normal activity levels.

2-801 LIFE CYCLE COST ANALYSIS

In accordance with the Arkansas Energy Office (AEO) rules for Energy Efficiency and Natural Resource Conservation in Public Buildings, Agencies and the Project Designer are required to evaluate all material and equipment selections on the basis of life cycle cost as opposed to a first cost only for new construction projects exceeding 20,000 SF and for renovations of buildings exceeding 20,000 SF wherein the renovation cost exceeds 50% of the insured value of the building. During a competitive bid process for construction, often the product having the better life cycle cost can be incorporated into the project for little or no incremental cost over the lesser quality product. Agencies should evaluate the proposed products at a 30 year life cycle. Careful consideration should also be given to the utility escalation rates, the maintenance rate and the discount rates for the cost of money. These factors can vary significantly from those applied to private sector cost (shorter life cycle) and if improperly applied can invalidate the analysis. Agencies are encouraged to use life cycle costing on all other projects to the extent that it is economically feasible.

2-802 AUTOMATED CONTROLS

Where possible use automatic controls for HVACR systems and for lighting applications. Space temperature and humidity should be controlled by automatic controls capable of maintaining the space set-point within a fixed upper limit and lower limit. Where practical, provide for the automatic setback or setup of the space temperature during the un-occupied periods. Avoid turning off systems where the rise in space temperature or humidity above the ASHRAE recommended maximums might result in damage to the building materials or growth of microbiological organisms. Avoid exposing the building water systems or other components to potentially damaging freezing conditions. Where possible, use space occupancy sensors such as motion sensors to control lighting and individual room air conditioning terminal units allow setback or to turn out the lights when a space is unoccupied. Where sufficient natural lighting exist due to windows or skylights, use automatic lighting controls to regulate the overall space lighting levels.

2-803 MANUAL CONTROLS

When automatic controls are not part of the building systems, the building manager should develop policies for each building or facility. These policies should be written and distributed to all employees. The policy should encourage the conservation of energy through the direct involvement of the building occupants. Occupant efforts should include activities such as turning lights off when not in use; maintaining thermostat settings as directed by the building manager; set-back or set-up thermostat settings during the un-occupied periods; do not leave windows open when the building heating or air conditioning systems are in operation; use the blinds or drapes to moderate the lighting level in the space so as to take maximum advantage of the natural lighting and so as to reduce the building air conditioning load; leave blinds or drapes closed when the space is un-occupied and over the weekends and holidays; do not use electrical space heaters in spaces that are air-conditioned. Adjust the heating/cooling set-points or encourage employees to dress in multiple layers of lightweight clothing such as jackets or sweaters, which can be removed or added to accommodate individual variations in comfort levels.

2-804 EQUIPMENT EFFICIENCY

(A) Do not overlook water conservation as an opportunity to reduce or manage the building operating cost. When selecting water-cooled or liquid-ring seal equipment, consider the water usage rates. When designing or operating lawn irrigation systems, consult with the Cooperative Extension Service to determine the maximum water rates for all vegetation. Evaluate the soil conditions with regards to absorption rates. Where possible, provide irrigation systems that calculate the evaporation transpiration rate based on local conditions. It is more effective to have multiple watering cycles to allow ample time for the water to absorb into the soil than to have longer cycles, which result in excessive run-off. Be cautious not to over water especially where large trees are concerned. The damage caused by the loss of an old growth tree due to over watering can be many times the cost of proper watering in that area. Where possible, use plumbing fixtures with infrared sensors to activate the flow of water. This not only saves water but also is also more sanitary and reduces the transmission of bacteria from hand contact with the fixture.

(B) Agencies and designers should endeavor to specify new equipment and fixtures to be Energy Star compliant. Energy Star equipment has been tested and certified to be low energy

consuming during normal operation. In addition many Energy Star products such as computers have built-in power reduction modes that further reduce energy consumption during non-use or standby periods. Building managers should encourage occupants to not defeat or disable these energy reduction features. Equipment, like building systems, should be selected based on the best life cycle cost for each specific application.

2-805 ENERGY STAR BUILDING PROGRAM

(A) The Energy Star Building Program is a voluntary partnership between U.S. organizations and the U.S. Environmental Protection Agency (EPA) to promote energy efficiency in buildings. These organizations represent owner-occupied public and privately owned buildings. The EPA provides participants in the program with unbiased technical information, customized support services, public relations assistance, and access to a broad-range of resources and tools.

(B) The Energy Star Building Program allows building owners to benchmark their building's energy performance relative to other similar properties in the program database. The Energy Star Building Label is awarded to buildings performing in the top 25% percentile of the market. This mark of excellence in energy performance signifies that the building has out-standing energy performance, lower operating cost and superior value. Buildings qualifying for the Energy Star Building Label are eligible to receive a placard to display on the building denoting the building as an Energy Star Building and the year date the building was certified.

(C) The Energy Star Building Labeling program is co-sponsored by the EPA and the U.S. Department of Energy. Information concerning the program criteria and participation can be accessed through the EPA web site at www.epa.gov/buildinglabel. Agencies are encouraged to apply for the building label.

(D) The Energy Star Portfolio Manager building benchmarking program is recommended for agencies subject to the energy reduction mandate of Executive Order 09-07 and Arkansas Code Annotated § 22-3-2001 et. Seq. as a tool to monitor and achieve the goals of the Agency's Strategic Energy Plan.

2-900 DESIGN STANDARDS

(A) The standards contained herein are considered the minimum acceptable for capital improvement projects submitted to the Section. Agencies and their design professionals are encouraged to exceed these standards when in the best interest of the State. If the Agency encounters a situation whereby these minimum standards cannot be met, the Agency shall submit a written request to the Section for a waiver of each specific standard. The wavier request shall define the conditions of the project that cannot meet the MSC, the applicable paragraph references for which the waiver is sought, the cost of compliance with the MSC if the waiver is not granted, and the cost of the proposed alternate construction and why the Agency cannot comply with the standards under the proposed project. All waivers must be approved by the Section in writing prior to the first plan submittal to the Section.

2-901 DESIGN PHILOSOPHY

(A) The goal of the Agency and its consulting Design Professionals should be to create a capital investment that meets the user's functional requirements, program requirements and provides the most economical life cycle cost for the taxpayer. Buildings and structures will often be used

for periods exceeding fifty (50) years and consequently, should be designed for durability, adaptability, and economy of operation and ease of maintenance. The State currently has many functioning buildings that are over fifty (50) years old.

(B) Building system components should be selected on the basis of life cycle cost. If an increased first cost or initial cost can be documented to show a reduced life cycle cost for the State, particularly for operating and personnel cost, then the design should incorporate the more expensive first cost feature or system. Studies have shown that the initial construction cost for most buildings equals 10 percent or less of the total cost of owning and operating a building over the life cycle of the building. Agencies shall require the Design Professional to produce life cycle cost data for review before approving a design element or system where required by the AEO rules for Energy Efficiency and Natural Resource Conservation in Public Buildings.

(C) Agencies must be alert to ensure their consulting Design Professionals exercise discipline in their designs to promote efficient use of facility space in terms of floor area and building volume. Exterior design features and materials should be consistent with the architectural character of the surrounding buildings and should complement the natural materials at the site. Excessive features or unusual geometry, which are not related to the function or intended use of the facility, shall be avoided.

(D) Acceptance of a particular design does not imply that other more cost effective designs are not acceptable. Good architecture can be achieved simply by good design which implies sensitivity to scale, mass, proportion, color, materials, lighting and detail, none of which necessarily cost more.

2-902 DESIGN STANDARDS AND REQUIREMENTS FOR OWNER/AGENCIES

(A) The Agency and the Design Professional should be aware of differences between private work and work performed for the State. Failure to comprehend these basic differences in rules and policies can result in costly disputes, protest, claims, and document re-submittals. The Design Professional should become familiar with these differences, which include but are not limited to the following areas:

(B) Since the knowledge and experience of the contractors bidding on the project is unknown, drawings and specifications requirements shall be clear as to the intent of the work. The plans and specifications must be clear, concise, and provide thorough detailing of existing and new construction.

(C) Sections, details, and dimensions must be in sufficient quantity, clarity and detail to allow the bidder to understand what is expected, to make takeoffs of material types and quantities, and once hired, to prepare shop drawings and execute the construction. This particularly applies to stairs, special connections for framing, typical details of system interfaces, flashing for roofs, walls, and similar building features.

(D) Details should clearly distinguish between existing and new construction. The drawings must also clearly show the beginning and the ending point of demolition requirements.

(E) The project design is solely the responsibility of the Design Professional. Specifications requiring the contractor to provide engineering design are not acceptable unless the products specified for contractor design are closed-engineering systems. Closed engineering systems

may include pre-engineered metal buildings, elevated water storage tanks, prefabricated trusses, post tensioned structural concrete slabs, pre-cast concrete systems and common steel structural connections. Other systems can be classified as closed-engineering systems if approved in writing by the State Engineer. When closed-engineering system specifications are used, the Design Professional shall include the requirement for such systems designs to be stamped by a professional engineer duly licensed to practice in the State pursuant to Ark. Code Ann. §22-9-101 et seq. Closed-engineering system shop drawings shall be submitted through the Design Professional to the engineer of record for review and approval for incorporation into the overall project design.

(F) In order to encourage competition required in the expenditure of public funds, performance specifications that define a desired result or assembly are strongly preferred. If performance specifications are not practical, and a manufactured product must be used to define a desired result of assembly, then at least three manufacturers and three products should be referenced. Do not reference both manufactured products and performance criteria because conflicts in the performance criteria and the product performance may create ambiguity and result in the misapplication of a product, a protest, or a claim.

2-903 SPECIFICATION STANDARDS

(A) Specifications shall clearly define the quality, performance, and installation standards for the Work and the conditions under which the Work is to be executed. They shall be in sufficient detail to describe the materials, equipment and supplies, and the methods of installation and construction. Required tests and guarantees shall be indicated in the specifications.

(B) Federal Specifications, MILSPECS, Corps of Engineers Specifications, Arkansas Highway and Transportation Department Specifications and the like, often contain requirements or standards, which are not applicable to State work. Those specifications may contain requirements and options ranging from the lowest quality to the highest quality product, which must be carefully reviewed, selected and identified in the specifications. Therefore, it is recommended that all reference to these types of specifications be avoided.

(C) Specifications shall be on 8 ½" by 11" sheets and bound into a project manual with bid sets preferably printed on both sides of the sheet. Type print size shall be suitable for microfilming and shall not be smaller than 12-point type size. The table of contents pages, or index, shall be dated with the same date as the drawings and shall be sealed and signed by the appropriate Design Professionals.

(D) The Project Manual shall include but not be limited to:

- (1) Title of Project and Name of Agency;
- (2) Names, address, phone and fax numbers of the Design Professional and all consultants;
- (3) An index of all contents;
- (4) Notice of Invitation to Bid;
- (5) Instructions to Bidders;

- (6) Bid Form;
 - (7) The General Conditions;
 - (8) Supplemental General Conditions, (if applicable);
 - (9) Contract Between Owner and Contractor;
 - (10) Workers Compensation Insurance Certificate;
 - (11) Standard Performance and Payment Bond;
 - (12) List of Drawings;
 - (13) Other Division Zero (0) Requirements, as appropriate;
 - (14) Technical Specification (Divisions 1-49 Applicable Sections);
 - (a) Technical Specification Sections shall be numbered with appropriate six digit section numbers corresponding to the CSI numbering system. The preferred paragraph numbering system format is the Alpha Numeric format.
 - (b) Technical Sections shall be subdivided into the Part I-General, Part II, Products, Part III-Execution format.
 - (15) Appendices containing Soils Report, Asbestos Report, or other information pertinent to the project but not a part of the Work. Such material should be noted as, "INFORMATION ONLY", for use by the Contractor as he deems appropriate.
- (E) The four (4) types of specifications used on State projects are performance specifications, non-proprietary specifications, proprietary specifications and sole source specifications.
- (F) Performance Specification or Non- Proprietary formats are the preferred methods of specifying materials, equipment and systems. A non-proprietary specification shall be written either as a generic performance specification (preferred); or as a specification naming a minimum of three (3) manufacturers with model or series numbers. The following describes the ABA requirements for performance specifications and non-proprietary specifications.
- (1) A generic performance specification must be written to describe the required characteristics, performance standards, capacities, quality, size or dimensions, and the like, of the item or system. The specifications must be written with sufficient detail to allow manufacturers to determine if their product meets the requirements of the project. Include only the salient features that will be used to judge a product's acceptability for the project. The performance specification shall not name manufacturers or brand name products.
- (2) A non-proprietary specification may be based on a manufacturer/model number type specification and must list at least three (3) manufacturers with their respective model numbers. Each of the listed manufacturers/model numbers must have been determined by the Design Professional to meet the specifications and be acceptable. If a named manufacturer prepackages or preassembles its item or system, the model number shall be specified. If the

named manufacturer(s) custom builds the item or system, naming of model numbers is not required. When model numbers are used in a specification, be aware that each number and letter may be a unique identifier for various features of that manufacturer's product line. Avoid listing model long numbers. Limit the model number to the point necessary to describe the appropriate series of products and describe the unique product characteristics in the body of the specification or the schedules.

(3) The non-proprietary specification must describe the required characteristics, performance standards, and capacities that will be used to determine equal products. Do not specify extraneous characteristics that do not relate to the products' performance or suitability for the project. The specification shall not be contrived to exclude any of the manufacturers listed or to benefit any one (1) manufacturer over any of the other manufacturers. If only two (2) acceptable manufacturers can be found and documented by model number but other equal products are acceptable if found by the bidder, the Design Professional may list only those two (2) manufacturers and the phrase "or equal". If the phrase "or equal" is used the design professional may only reject the unnamed substitute if there is clear evidence of non-compliance in the submittal information presented for review or documented evidence that the substitute product or material has failed to perform satisfactorily as intended.

(G) A specification is proprietary if it fails to meet requirements of a generic specification or a non-proprietary specification. Although a proprietary specification should be avoided because it restricts competition, circumstances such as space limitations, mandatory performance standards, compatibility with an existing system, and the like, may leave no other reasonable choice. Two (2) typical situations that may require proprietary specifications are:

(1) When only two (2) manufacturers or suppliers provide an acceptable product or system, when there are no equals and when no substitutions are allowed or

(2) When only one (1) manufacturer is available, but two (2) or more vendors or suppliers can purchase the material and compete to provide the product or system to contractors or bidders.

(H) A specification is sole source when it names only one (1) manufacturer or product to the exclusion of others, or when it is contrived so that only one (1) manufacturer, product, or supplier can satisfy the specification. A product or piece of equipment that is available only through a single franchised vendor is also considered to be a sole source item.

(I) Proprietary and sole source specifications may be used only when the Agency has determined that a proprietary or sole source specification is in the best interest of the State and that use of alternate materials or equipment will be cost prohibitive. When a sole source specification is used, the specification shall clearly identify the materials or equipment as a proprietary or sole source item, the approved supplier or installer and a cost allowance shall be allocated in the appropriate section for Allowances in the project manual. In this manner, all bidders will have equal pricing for all allowance items within their bid price. For projects awarded by summation of unit pricing, the item(s) may be shown as a unit price line item without the allowed cost shown. The Agency shall incorporate the proprietary or sole vendor/supplier's pricing based on the final construction drawings into the allowance item and shall retain a copy of the vendor/supplier's price proposal for the item for record. To ensure that accurate cost accounting of allowances is maintained, adjustments in the allowance cost during the construction phase shall be by individual line items matching the allowance schedule. Combining multiple allowance items into a single price or lumping allowance adjustments into a

single pricing with other items is prohibited. It is acceptable and appropriate to include allowance adjustments with other cost items in a single change order provide supporting documentation is attached to delineate the allowance adjustments.

(J) Prior to advertising the project for bids that contain sole source specifications, the Agency is encouraged to either procure the sole source item and specify it as Owner furnished/Contractor installed or the Agency may pre-select a sole source item through a competitive life cycle cost request for proposals (RFP). The product having the lowest life cycle cost shall be selected and shall be included in the specification as an allowance cost item listing manufacture, product number, allowance price, vendor contact name, address and phone number and the manufacturer's quote number. The specifications shall clearly indicate that the specified product was selected on the basis of a Life Cycle Cost Analysis.

(K) The use of standardized specifications or "guide specs" as a basis or resource for editing has many advantages for the Design Professional, the Reviewer and the Contractor. The Design Professional shall edit the guide specifications to include only the materials, requirements, and procedures applicable to the project. Specifications, which are submitted without editing, will be rejected as an incomplete submittal. Where Military guide specifications are used on a project, they shall be edited to delete references to Military and Federal Specifications. References to the Contracting Officer shall be changed to the Agency. Also, requirements for tests, inspections, and visits to the manufacturer's plant, and the like, which are not normally required for state projects shall be deleted.

(L) The Design Professional shall not require samples, shop drawings, or similar materials to be submitted for approval prior to receipt of bids without the specific written approval of the Section. The specifications must contain sufficient information to describe to the contractor and bidders the performance and quality standards that will be used to evaluate the submittals.

(M) Complex or sensitive systems such as locking systems, detention equipment and security control systems for prisons often require manufacturers with a proven history of reliable, operable equipment in special situations with minimal malfunctions. In these instances, sole source or proprietary specifications may be appropriate.

(N) Projects for the State are not "testing grounds" for new type of materials or equipment. However, the fact that a material is newly developed does not preclude its use if documentation of recognized, independent laboratory tests clearly shows that the material will meet the applicable requirements for the project. The Agency shall submit a written request and justification to the Section for approval to specify a new product or material prior to the Final Plan Review submittal. Unless the manufacturer of a new product furnishes factual data sufficient to evaluate the product, it should not be considered for use. If a new product is considered for use, a competitive-type specification should be written to assure that a competitive; good-quality product will be obtained. In instances where competitive specifications are not appropriate, a sole source or proprietary specification may be appropriate. The Agency, with the approval of ABA, may authorize use of a new material, equipment or system for a particular project on a trial basis for observation or evaluation.

(O) Specifications must clearly indicate the requirements for the project. Words or phrases, which are vague or may be interpreted more than one way often lead to problems during bidding or construction and result in change order or claims. The following instructions are

intended to reduce common errors and conflicts evolving from interpretations of the specifications.

(1) Under Requirements, do not say, “the Work consists of.” Drawings should show the entire ‘scope of the work’. If necessary to list certain parts, say “Generally, the Work includes...”

(2) In lieu of reference to the accompanying drawings, use the words “as shown,” “as indicated,” “as detailed” or “as approved by...,” “as directed by.....,” “as permitted by.....”

(3) The Contractor is responsible for determining the packages of work for each subcontract. It is acceptable to specify certain specialty work to be performed by person qualified, certified or licensed (if appropriate) and experienced in this type of work. If it is necessary to reference a specific trade group, it may be referred to as that group or trade by the CSI division number or section number i.e.: “Division 26” for electrical work instead of “electrical sub-contractor” or “Section 283100-Fire Detection and Alarm” instead of “fire alarm contractor”.

(4) Do not use “etc.” This term is too indefinite for bidding and inspection purposes.

(5) Minimize the use of cross-references and in no case use paragraph numbers for this purpose. If it is necessary to refer to a particular paragraph, do so by its section number and title (e.g. Section 03 30 00, Cast-in-Place Concrete).

(6) Do not include a paragraph in the various sections entitled “Work not Included”, describe only the work that is included under the respective sections.

(7) Specifications should clearly delineate air conditioning ducts, heating ducts and piping systems, which require insulation. The phrase “insulating all ducts except in conditioned spaces” has resulted in differences of opinion and claim situations. All duct systems should be appropriately designated as supply, exhaust, outside air intake, transfer, relief, or return and further clarified by stating insulating requirements.

(8) Do not confuse “any” and “all”: “Correct any defects” should read “Correct all defects.”

(9) Do not confuse “either” or “both”; e.g., “Paint sheet metal on either side” should read “Paint sheet metal on both sides.” “Either” implies a choice.

(10) Do not confuse “or” and “and”; e.g., “The equipment shall not have defects in workmanship and material.” The use of “and” in this sentence indicates both requirements must be met. e.g. “Additives that decrease strength or durability are not permitted.”

(11) Do not use “and/or.” The courts have considered this phrase to be intentionally ambiguous and, therefore claims are often rendered in favor of the Contractor.

(12) Use statements that are definite and contain no ambiguous words and phrases “Remove” implies to take away from its current location. If “remove” is used, the Design Professional must also indicate whether to dispose of, salvage, or re-install the material “removed”. “Reinstall” implies putting the existing back in the indicated place. If “reinstall” is used, the Design Professional must also indicate that the Contractor must carefully remove the item, properly store it, and then “reinstall” the item at appropriate time. “Replace” implies removal of old material and furnish and install new material. The preferred wording would be to “remove” and “provide”.

(13) "Provide" is defined as "furnish and install." When material or equipment is "furnished" by the Agency directly or under other contracts for installation by the Contractor, the term, "install" should be used; however, the Contractor may be required to "provide" foundations, fastenings, and the like, for the installation. If the word "install" is used alone, the Bidder or Contractor has a right to assume, on the basis of the definition cited, that the Agency will "furnish" the materials in question.

(14) Do not include equipment schedules in the specifications. Equipment schedules should be provided on the plans for quick access and review. The construction record prints are often used by the building maintenance and operation personnel on a daily basis. Having the equipment schedule information readily available on the plans can save critical time and avoid confusion during an operational emergency or repair.

(15) Ensure that the plans and specifications do not contain statements or requirements similar to the following: "[Contractor][Supplier][Installer] must have a minimum of X-years of experience in [installation][manufacture] of the specified [project][product] or must have [office][facilities] located within X-miles of the project site." These types of statements can be construed to unfairly limit competition in the procurement of State funded projects by unnecessarily excluding some Arkansas providers and can result in bid protest which may result in lengthy delays in award of the project or rejection of all bids and necessitate re-bidding and or redesign of the project. This prohibition will not negate the use of LEED MR Credit 5 for regional materials as this credit allows materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site. This range encompasses the entire state of Arkansas regardless of project locations so no Arkansas manufacturer or provider will be excluded by this requirement.

2-904 DRAWING STANDARDS

(A) The following represents the minimum requirements, standards, and expectations applicable to all drawings prepared for bidding and construction on state projects. Refer to § 2-1504 for a description of the contents of each discipline submittal. Note that not every category will be used on every project. The Design Professional shall select the appropriate categories for each specific project.

(B) Arrangement of Drawings: Drawings shall be arranged in the following order with the discipline identifying character shown:

T Title Sheet & Index

TS Topographical Surveys & Plot Plan Drawings

B Boring Logs & Soils Data

D Demolition Drawings

C Civil Site Drawings

L Landscaping Drawings

FA Fire Service Access Drawings

A Architectural Drawings

K Kitchen Equipment Drawings

S Structural Drawings

M Mechanical (HVAC) Drawings

FP Fire Protection Drawings (Sprinkler Systems)

P Plumbing Drawings

E Electrical Drawings

* Special Category Drawings (Assigned by the Section)

* For special categories such as laboratory case work, acoustical plans, audio-visual plans, and the like, that do not readily fit into the defined categories; contact ABA for a drawing category assignment.

(C) Drawing Numbers: Drawings shall be sequenced by discipline letter and number, i.e., A1, A2, A3.1, A3.2, S1, S2, and the like. For large projects (exceeding 20 sheets) the Section recommends the designer use a flexible numbering system such as A1.01, A1.02 for plans, A2.01, A2.02 for sections, and the like. This will allow Designer to insert additional drawings as the project develops without requiring a re-numbering of sheets.

(D) Sizes of Drawing Sheets: Drawing sheet size, except in special cases approved by the Section, shall be 24" by 36" (preferred) or, alternatively, 30" by 42". Drawings shall be prepared so as to be suitable for microfilming and for making clear, legible half-size reproductions.

(E) Lettering: Unnecessary letter embellishments, poor spacing, careless lettering, weak lines, and lettering which is crowded or too small result in illegible films and poor reproductions. The minimum height for hand lettering on all projects shall be 1/8". Mechanical (typed or CADD) lettering shall be 1/10" minimum and in all caps. Make minimum gap between lines equal to one-half the letter height. Lettering and line weight must be in accordance with classical drafting practices.

(F) Detail Numbers: Each plan view, section view or detail shall be given an individual detail number to facilitate written and verbal communication.

(G) Scales: An indication of the scale of the object drawn shall be located directly under the title of each plan, elevation, section, detail, and the like. (Example: Scale 1/8"=1'0"). All floor plans shall be drawn at a minimum scale of 1/8" = 1'-0". The use of a smaller scale for floor plans must be approved in writing by the Section prior to the first submittal. Avoid odd size scales such as 3/32" = 1'-0" as these scales often lead to takeoff errors. In addition to the standard inch/foot scale, provide a graphic bar scale that can be used for the approximation of dimensions on reduced size plan sets. Use break lines and match lines for larger building plans. For sheets with one plan such as a floor plan or site plan, the title should be located

centered under the main part of the plan or at the lower right-hand corner of the sheet. The north arrow should be located at the right side of the title.

(H) Provide a master listing of all applicable abbreviations and symbols used in the set of drawings or provide a listing of all common abbreviations and symbols at the beginning of the drawings and provide a listing of the discipline specific abbreviations and symbols at the beginning of each discipline. For complex piping schematics, electrical riser diagrams of special system layouts, the designer is encouraged to provide an abbreviated legend of symbols on those specific sheets to minimize the need to flip sheets to find critical symbols.

(I) Topographic and civil site drawings shall conform to the approved site plan and shall show building location by dimensions, existing and approximate new finished grades, roads & walks, temporary & permanent erosion and sediment control devices, and storm-water management facilities.

(J) Boring logs representing soil conditions encountered in the site investigation including pertinent logs from previous explorations in the project location should be presented in the project manual for informational purposes. Logs shall show the ground elevation, the depths of borings, depths and classifications/descriptions of materials encountered, blow counts per ASTM D-1586, ground water elevation, and other pertinent information. Boring locations relative to the project shall be shown on a small-scale location plan or on the Site Plan.

(K) Building Floor Plan drawings for all disciplines shall be oriented the same to avoid confusion and to facilitate overlaying of drawings. It is customary for a building plan to be oriented with north toward the top or left edge of the sheet. All plans shall have a North Arrow for orientation. For projects where the plan is divided and shown on multiple sheets, provide a key plan on each plan sheet and crosshatch or shade the area of the key plan shown on the sheet. Provide clearly defined match lines and reference the sheet where the match can be found. Avoid showing construction information across the match lines as this can lead to confusion and duplication of material counts.

(L) The drawings shall describe/show the Work to be provided by the Contractor. Existing features, structures, or improvements to remain shall be so noted. Existing features, structures, or improvements to be demolished and/or removed shall be clearly identified. Work, improvements, demolition or construction, which the Agency will perform or have performed by separate contract, shall be identified as "Not in Contract" or "NIC" if the abbreviation has been defined. Do not use the phrase "Work by Others".

(M) All foundation and floor plans shall be drawn to a scale not less than 1/8"=1'-0" with all necessary dimensions shown. Roof plans are preferred at 1/8"=1'-0" scale; however, roofs without mechanical equipment and metal/shingled pitched roofs may be drawn at a 1/16"=1'-0" scale if approved in writing by the Section prior to the first submittal to the Agency. Foundation, floor and roof plans shall show all permanent equipment vents, utilities or pipe penetrations, openings and such items affecting the construction. All plans shall be provided with column numbers or grid numbers to facilitate written and verbal communication describing the location of specific information on the plan.

(N) Design live load capacity for all floors and the roof in pounds per square foot shall be noted on structural floor plans.

(O) Every floor plan or partial plan or space shall be provided with a unique room number and/or name. All schedules shall reference the specific room number to which the schedule applies. Reflected ceiling plans shall show room numbers, locations of lights, HVACR items, sprinkler heads, speakers, smoke detectors, and the like.

(P) Enlarged plans to 1/4" scale shall be furnished to clearly show the location and arrangement of built-in equipment/casework and of the furniture, fixtures, equipment, and the like, which influence the location of utilities, including electrical, plumbing, heating, and the like, and the assignment of space within the project.

(Q) A minimum of one transverse and one longitudinal section through the building shall be shown along with as many additional sections as are needed for understanding the overall construction requirements. Include necessary dimensions on each. All elevations shall be drawn to scale at not less than 1/8" equals 1'-0".

(R) Typical wall sections shall be drawn at not less than 3/4"=1'-0" scale. Typical window, door and special opening details shall be drawn at 1-1/2"=1'-0" scale or larger.

(S) Provide stair sections for each stair configuration including dimensions, sizes, framing members, components, and any special details required.

(T) Provide all necessary interior and exterior details, including special doors, windows, woodwork, paneling or other decorative work, toilets and washrooms, and the like, with plans and elevations at a minimum scale of 1/4"=1'-0" and with construction details at a minimum of 3/4"=1'-0".

(U) Door schedules shall include door number, label or type, size, material, frame, lintel, and remarks. Also provide elevation and detail references. Window schedules shall include make or type, size, material, and lintel remarks. Also provide elevations and details, if required for complete description. Finish schedules shall include space or room number, space name, floor finish, wall type/finish, ceiling type/finish, ceiling height, base, wainscot, remarks, and other comments, if required.

(V) Provide an enlarged plan view of each unique mechanical, electrical or equipment room. Equipment room plans shall be drawn at 1/4"=1'-0" scale minimum. Provide a minimum of one section through each equipment room drawn at 1/4 = 1'-0" minimum to clarify the height of, equipment, ductwork, piping and the like. Provide one (1) longitudinal section and one transverse section through the building (minimum) to show mechanical and electrical work with relation to the work by other disciplines. Provide other partial sections as required to clearly explain the scope of the work and to describe the restrictions at congested areas.

(W) Relation of Drawings and Specifications: Drawings generally indicate the scope of work, locations, relationships, and dimensions while specifications generally indicate quality, performance and installation requirements. Drawings and specifications shall supplement each other and must not conflict. Terminology used in specifications and drawings should be the same. For State projects, the drawings and specifications are considered complimentary of each other and neither shall take precedence over the other. Where conflicts arise between the drawings and specifications, the more stringent requirement shall apply.

(X) Since the final plan review drawing submittals are, in the opinion of the Design Professional, complete and ready for bid, all drawings submitted for final review shall bear the Arkansas registration seal and signature of the individual or individuals responsible for its design (and corporate seals where applicable). To prevent incomplete drawings from being mistaken as construction drawings, the Design Professional shall over stamp the seal with either "Preliminary" or "Not for Construction" or "For Review Only". To facilitate proper review by the Section, the name and registration numbers on the seal should be visible and legible.

(Y) All drawings and the specifications submitted with the final plan review responses and issued for bid or construction shall be dated with the same date which is established by the Design Professional as the date the documents are (or will be) complete. Documents printed for bidding shall bear the date described above with no revision numbers or dates. In accordance with Architectural Act and the Engineering Act, the Design Professional shall sign and date the stamp.

2-905 QUALITY CONTROL

(A) The Design Professional shall be responsible for the professional and technical accuracy and coordination of all designs, drawings, specifications, cost estimates and other work or materials furnished under the standard professional services contract.

(B) The Design Professional shall perform a Quality Control review of the specifications and drawings prior to making a plan review submittal to the Agency. The Design Professional shall ensure that the plans and specifications being submitted for review meet the MSC submittal requirements and that all elements of the design have been coordinated with respect to function and location. It is not the responsibility of the Agency, ABA, or the Contractor to ensure that the plans have been coordinated from sheet to sheet and discipline to discipline.

(C) The cover sheet of all plans and specifications submitted for review to the Section shall contain the following statement signed by the responsible Design Professional who is a Principal in the firm. Failure to perform proper coordination or to include and sign this statement may be grounds for rejection of the submittal without review. This statement may be removed from the cover sheet prior to issuing the plans for bids:

" A Quality Control check, including the appropriate coordination among disciplines, has been made on this project's documents, and corrections related to this check have been made. The undersigned principal/owner states that these plans and specifications as submitted for review are, to the best of his or her knowledge and ability, complete and ready for review."

Signed _____ Date _____
(name and title)

(This statement need not appear on sets of documents issued to bidders)

2-1000 ACCESSIBILITY FOR INDIVIDUALS WITH DISABILITIES STANDARDS

(A) Purpose: The requirements in this standard are intended to make buildings and facilities accessible to and usable by, individuals with disabilities such as but not limited to; the inability to walk, difficulty walking, reliance on walking aids, blindness and visual impairment, deafness and hearing impairment, coordination, reaching and manipulation disabilities, lack of stamina,

difficulty interpreting and reacting to sensory information, and extremes of physical size. Accessibility and usability allow individuals with disabilities to access, enter, and use a building or facility.

(B) This standard provides guidance for design and specifications for constructed elements that make spaces accessible.

(C) This standard can be applied to the design and construction of new buildings and facilities, renovations, alterations and rehabilitation of existing buildings and facilities and is applicable to permanent construction as well as temporary construction and emergency conditions.

(D) Ark. Code Ann. § 6-20-1407(e) authorizes the Section to review and approve construction documents for new public school facilities for compliance with this standard prior to bidding or construction. Construction documents submitted for review shall comply with these standards.

2-1001 REVIEW AUTHORITY

(A) The Section is responsible for the review of accessibility standards and criteria for capital improvement projects of those state agencies under its jurisdiction and for public school new construction projects. (See Ark. Code Ann. §6-20-1407 (e)).

2-1002 ACTS, CODES AND STANDARDS

(A) There are numerous codes and standards which address accessibility issue in the constructed environment. The most common are the 2010 ADA Standards for Accessible Design which is the current standards adopted by the U.S Department of Justice(USDOJ), ANSI A117.1 Standard for Accessible and Usable Buildings and Facilities which is the standard adopted by the Arkansas State Fire Marshall through the Arkansas Fire Prevention Code (AFPC), the Uniform Federal Accessibility Standards (UFAS) which applies to certain projects funded partially or fully with Federal funds, and the Fair Housing Accessibility Guidelines adopted by the U.S. Department of Housing and Urban Development (HUD) just to name a few.

(B) Since one or more of these standard may apply to a particular project (i.e. the ADA Standard and AFPC will apply to most projects subject to ABA review), the design professional should gain familiarity with the standards that apply to their specific project prior to submitting for review. When competing standards have differing requirements on a particular project, the most stringent requirement (the one providing the most accessibility) must be met.

(C) In certain projects, the use of a design guide other than the ADA Standard or the AFPC may be warranted or mandated by the funding source. Several of the standard accessibility guide documents are considered "Safe Harbor Documents" by the enforcement authority of other document review agencies. When the design professional prepares construction plans using one of the "safe harbor documents" he should include a note on the coversheet or the accessibility details sheet stating which guideline documents were used in the preparation of the plans and specifications.

(D) Copies of the Standards for Accessible Design, Code of Federal Register (Federal law pertaining to ADA) and technical guideline bulletins published by the US Department of Justice and the Access Board may be obtained at the following website www.ada.gov or by calling the US Department of Justice ADA Information line at (800) 514-0301 voice or (800) 514-0383 TDD.

(E) Furthermore, copies of the American with Disabilities Act of 1990 are available in the following alternate formats: large print, Braille, electronic file on computer disk, and audiotape. Copies may be obtained from Architectural and Transportation Barriers Compliance Board at (202)-272-5434 (Voice) or (202)-272-5449 (TTY). These telephone numbers are not toll-free numbers. For toll free ADA information call 1-800-872-2253. For email access, refer to TA@access-board.gov. The ACT addresses program requirements and defines the situations for which accessibility must be provided. The ADA Standards provide scoping and technical requirements that define the method or manner in which the constructed environment must be built to provide program access. The limits of ABA's review is to the constructed environment as governed under the Act and as defined in the current enforceable ADA Standards. It is within this parameter that the Section reviews are limited to the technical requirement of the scoping provided in the submitted construction documents. The Section does not provide commentary on the scoping or program requirements for the agency's facilities. ABA review will be limited to the technical requirements for the scoping provided in the construction documents presented for review.

2-1003 OWNER/AGENCY RESPONSIBILITIES

Owners are responsible for ensuring all facilities are in compliance with accessibility acts, laws and codes. Owners should evaluate facilities for the minimum scoping requirements, such as minimum number and types of accessible parking spaces on a campus and the like, to ensure compliance with the ADA and ADA Standards. These evaluations should be reviewed when contemplating future capital improvement projects.

2-1004 CONSTRUCTION DOCUMENT SUBMITTAL REQUIREMENTS

(A) Unless the project has been approved under the Delivery Method, a full set of plans and specifications should be submitted to the Section for review when the documents are 100% complete. A full set of documents is required for plan review and record.

(B) Plans submitted for Agency and ABA review should clearly define the elements and features required to be accessible. Partial plans, section views, elevations and details shall be provided at a scale large enough to show all applicable clearance and mounting heights and dimensions for each unique accessible feature. The drawings shall include but not be limited to the following:

(1) Provide a plan view of the building showing the intended accessible path into the building and to each accessible space or clearly describe the accessible path with a general or keyed note on the plan. Incorporating the accessible path by arrows, shading or other identifiers on the life safety plan is an acceptable method.

(2) Where parking is a part of the project, define the accessible path from the designated parking into the building.

(3) Where multiple buildings are included in the scope of the project show the accessible path between buildings.

(4) Where construction of a public transit stop such as a bus or trolley stop is included in the scope of the project or is existing on the developed site, define the accessible path between the stop and the project facilities.

(5) A detail sheet (or sheets) should be provided with the standard accessible elements shown and dimensioned and the plans should be cross referenced to the appropriate details. Referencing the ADA Standard is not a substitute for proper and accurate dimensions or specifications. Specific information on the drawing is required for the construction phase.

(6) Technical specifications shall clearly require that accessible components such as door hardware, furniture and fixtures be manufactured to meet accessibility standards and installed in accordance with the standards and manufacturer's recommendations. Components requiring adjustment to pressure thresholds of the standards shall clearly specify the minimum and maximum allowable limits as required by the standards.

(7) Field construction techniques and issues often arise that can cause a designed accessible element to be built out of compliance. Field verification during the construction phase by the design professional, building inspectors, and the building owner are essential to ensuring that non-compliant issues are identified early and corrected before the project is completed. Plans and specifications shall have sufficient details and dimensions to allow proper verification during and after construction.

2-1100 GRADING STANDARDS

To promote good drainage, ease of maintenance and ease of travel in and around state facilities, the minimum slopes or grades shall be established. Where existing natural grades prohibit re-grading to these standards without excessive cut or fill, obtain approval of the Section prior to the schematic design submittal.

2-1101 STANDARDS FOR GRADING AROUND STRUCTURES

CONDITIONS	MAXIMUM		MINIMUM		PREFERRED
Side slopes with vehicular access	10%	10:1	2.0%	50:1	1-3%
Back slopes with vehicle access	15%	6.6:1	2.0%	50:1	1-5%
Side slopes without vehicular access	15%	6.6:1	2.0%	50:1	1-10%
Back slopes without vehicular access	20%	5:1	2.0%	50:1	1-10%
Grassed athletic fields	2%	50:1	0.5%	200:1	1%
Berms and mounds	20%	5:1	5.0%	20:1	10%
Mowed slopes	25%	4:1	----	----	< 20%
Unmowed grass banks	Soils natural angle of repose				< 25%
Planted slopes and beds	10%	10:1	0.5%	200:1	3-5%

2-1102 STANDARDS FOR GRADING STREETS AND WAYS

CONDITIONS	MAXIMUM		MINIMUM		PREFERRED
Crown of improved streets	3%	33:1	1%	100:1	2%

Crown of unimproved streets	3%	33:1	2%	50:1	2.5%
Side slopes on walks	4%	25:1	1%	100:1	1-2%
Tree lawns	20%	5:1	1%	100:1	2-3%
Slope of shoulders	15%	6.6:1	1%	100:1	2-3%
Longitudinal slope of streets	20%	5:1	0.5%	200:1	1-10%
Longitudinal slope of driveways	20%	5:1	0.5%	200:1	1-10%
Longitudinal slope of parking areas	5%	20:1	0.5%	200:1	1- 5%
Longitudinal slope of sidewalks	5%	20:1	0.5%	200:1	1-5%
Longitudinal slope of valley section	5%	20:1	0.5%	200:1	2-3%

Note: Refer to § 2-1000 for grading requirements to meet ADA Guidelines.

2-1103 STANDARDS FOR DRAINAGE CHANNELS

CONDITIONS	MAXIMUM		MINIMUM		PREFERRED
Swale side slopes	10%	10:1	1%	100:1	2%
Longitudinal slope of swales-grass invert	8%	12:1	1%	100:1	2%
Longitudinal slope of swales-paved invert	12%	8.3:1	0.5%	200:1	5%
Ditch side slope-grass invert	8%	12:1	1%	100:1	3%
Ditch side slope-paved invert	10%	10:1	---	---	6%

2-1200 ROOFING SYSTEM REQUIREMENTS

These Minimum Roofing Systems Requirements are to provide design professionals and State personnel with functional, working guidelines to aid in the determination of the required roofing systems and specifications. A proper understanding of the roofing industry, methods of construction, application, workmanship, and its inherent problems and pitfalls is necessary in order to design a proper roof system.

2-1201 DETERMINATION OF THE PROPER ROOF SYSTEM

(A) In designing and specifying the proper roof system for a new building, the following should be considered:

(1) Type of building refers to a state owned or leased property (library, office buildings, campus buildings, the like.) under ABA oversight.

(2) Special considerations refer to what goes on in the building. For example, will there be a pool, a unique use inside the structure? The uses of the building will determine roof traffic, surfacing, need for a vapor retarder sheet and insulation ("R" value) requirements.

(3) External considerations include high winds, snowfall, rains and their concentrations, and outside contaminating processes.

(4) Life of the building determines how long it will be expected to last.

(5) Building and Regulatory Codes refer to Underwriters Laboratories, Factory Mutual, and the various applicable local, state and national codes.

(6) Structural considerations mean that the roofing system must work with the other building components. For example, are the edges of the roof deck flush or are there parapets. Dimensions of the building and shape of the roof deck will determine the need for expansion joints. Any protrusion ~~in~~ through the roof will require flashing materials.

(B) The Roofing System as specified should be a complete and compatible system. The system should be manufactured by a manufacturer doing business in this region of the United States. The design professional shall investigate the need for, and specify all roofing components needed for a complete roof assembly.

2-1202 STEEP ROOFING

(A) Asphalt shingles on sloped roofs shall be Class "A", fiberglass based, asphalt shingles with a recommended 25-year minimum limited warranty over felt underlayment installed as per manufacturer's specifications minimum slope: 4 in 12. "Peel & stick" self-adhered Ice and Water Shield synthetic underlayments are recommended along the roof perimeter, valleys and penetrations.

(B) Wood shingles shall not be used on buildings unless approved in writing by the Section. Any shingles used shall carry the "B" classification as listed by the Underwriters Laboratories, Inc. Minimum slope: 4 in 12.

(C) Metal roofing systems on sloped roofs in excess of 1 in 12 slope (minimum: 2 in 12 (+) slope preferred) are acceptable when properly detailed and specified.

2-1203 UNCONVENTIONAL ROOFING SYSTEMS

(A) Unconventional roofing systems (roof systems other than Built-up, Modified Bitumen, EPDM (Ethylene Propylene Diene Monomer) or Single-Ply)) shall be submitted for review to the Section, for approval on a case by case basis for use on the roof of a State building under ABA oversight.

(B) Criteria for approval shall be:

(1) Acceptable material and method of application;

(2) Ability of local installers to apply the proposed roof system;

(3) Ability of the State to obtain competitive bids on the proposed roofing system;

(4) Proven track record of the system and the manufacturer; and

(5) Roof warranty available from the manufacturer for the particular installation.

2-1204 ROOF SYSTEM COMPONENTS

(A) Decking:

(1) The type of structural deck and the complete roofing system to be used should be determined by the design professional. Slope for drainage shall be achieved by structural means if possible. If structural slope is not feasible, a lightweight concrete fill, sloped perlite board, or tapered insulation board shall be specified.

(2) The structural deck must be designed to provide an adequate "foundation" or base for the roofing system. In addition to supporting all design loads, it must also be relatively smooth, free of humps, depressions, offsets at joints, allow for expansion and contraction, and be rigid enough to support the equipment and materials needed to apply the roof system without undergoing excessive deflection or deformation, which could impair the life of the roofing system.

(3) Metal decks shall be fabricated from adequate gauge steel, accurately aligned, securely anchored to structure below. Provide side lap connections to prevent displacement between adjacent sheets. The design professional shall inspect deck for any possible defects prior to the installation of any insulation and roofing.

(4) On poured decks such as concrete, gypsum, light weight insulating concrete, the like, adequate drying time for the material shall be allotted prior to application of the roofing membrane.

(5) Over low slope wood decks, always specify a nailed down layer of sheathing, (5 lb. rosin paper), as a separator sheet followed by felt underlayment and a layer(s) of insulation to prevent problems with roofing such as nails backing out, expansion and contraction, the like.

(B) Insulation:

(1) Insulation thickness shall be specified by the design professional and be such that when combined with complete roof and ceiling construction, shall have an overall heat transmission coefficient to obtain a satisfactory "R" value meeting applicable energy use codes. Insulation should have sufficient density and rigidity to span any flutes or irregularities in the decking and support the weight of all anticipated traffic on the roof without crushing or breaking down of the edges. The design professional or consultants or both shall verify the insulation requirements for each particular building and roofing system. Provide adequate ventilation in the plenum spaces to prevent moisture and condensation from damaging the interior spaces of the building.

(2) All insulation shall be applied in two (2) layers with all joints broken and staggered. All insulation boards shall be installed in the same direction throughout, unless fields are separated by an expansion joint. Butt edges of insulation tightly and cut in neatly around all roof penetrations.

(3) Insulation shall be secured to deck using approved fasteners conforming to Factory Mutual System, Class I construction for wind uplift protection unless otherwise approved by the Section.

(C) Securement/Fasteners: All roof assemblies for new construction shall meet or exceed specifications for Factory Mutual System, Class I, construction in regard to wind uplift protection.

(D) Fire, wind, and code requirements: New roof construction on buildings shall meet or exceed all applicable codes. In addition, the roof assembly shall meet or exceed specifications for Underwriters Laboratories, Inc., Class "A" construction and Factory Mutual System, Class I construction, in regards to fire resistivity and wind uplift. When re-roofing existing buildings, this may not always be possible, especially when re-roofing over existing membranes. Submit plans and specifications to the Section for approval.

(E) Vapor Retarder Sheets:

(1) The design professional shall investigate the need for, and specify as required, the proper vapor retarder sheet and its applications. All buildings with high humidity (such as swimming pools where moisture migration will be a problem) should be specified with vapor retarders unless otherwise approved by the Section.

(2) The vapor retarder sheet shall be installed over the roof deck prior to the installation of the insulation or roof membrane or both. Seal all edges, punctures, and around all penetrations through the roof to form an envelope enclosing the insulation.

(3) The vapor retarder application shall meet all fire retardant requirements which building use requires. Refer to applicable building codes for requirements. Determine proper attachment for wind uplift protection from manufacturer's specifications.

(F) Venting Base Sheets are usually heavy-coated base sheets with an embossed grid designed to channel current moisture out of built-up and modified bitumen roof assemblies and prevent blistering. Venting base sheets are primarily used on re-roofing applications or to vent moisture out of poured gypsum or lightweight concrete decks. Application is by spot mopping to existing membranes or mechanical attachment to a nailable deck. In some instances, it is more desirable and economical to use gypsum board or perlite "re-cover" boards in lieu of a separate venting base sheet. Moisture release vents should always be specified in conjunction with a venting base sheet. See § 2-1204 (G).

(G) Moisture release vents shall be installed on all roof systems when required for certain type of poured decks and re-roofing over existing membranes. Vents for bitumen roof systems shall be only 'factory made' vents with spun aluminum housings designed to vent moisture out, but not allow moisture back into the roofing system. 'Shop built' sheet metal vents are not acceptable for use on buildings. Moisture release vents are primarily designed to vent moisture from a roof system including insulation and to reduce the possibility of blistering. To properly vent, holes should be cut all the way down to the deck, or vapor retarder sheet where applicable, according to the manufacturer's specifications.

(H) Membranes for Built-Up Roof Systems:

(1) Built-up roofing membranes for buildings shall be asbestos-free felts with fiberglass and/or polyester mats.

(I) Membranes for Modified Bitumen Roof Systems:

(1) Membranes for Modified Bitumen roofing shall be a minimum of an asbestos-free felt with fiberglass and/or polyester mat overlaid with a modified bitumen cap sheet.

(J) Roof surfacing for Built Up and Modified Bitumen Roof Systems:

(1) For APP (or Atactic Polypropylene) Modified Bitumen and Built Up Roof Systems: An Energy Star® approved fibrated aluminum roof coating (asbestos free) (A.S.T.M., D-2824, Type III) applied in two (2) separate coats, at the rate of 1 1/2-2 gallons per 100 sq. ft., is the preferred roof coating for state-owned buildings. Aggregate ballast is not recommend for built-up roofing with aluminum coating.

(2) For (or Styrene-Butadiene-Styrene) Modified Bitumen Roof Systems: Ceramic Granules or Metal Clad "Veral"

(3) For Built-Up roofs, where aggregate ballast is allowed by code: All aggregate surfacing shall be clean, dry, rounded pea-gravel ranging in size from 1/4" to 3/8", applied as per manufacturer's specifications for the particular installation. (400 pounds per square, minimum is the typical application.) Light color aggregates are preferable to aid in heat reflectivity.

(4) Asphalt and Emulsion coatings are not recommended.

(K) Roof Cants

(1) Roof cants shall be required at all vertical projections including walls, equipment curbs, and the like on bituminous roof systems. Cants shall be securely set in hot steep asphalt or cold applied adhesives. Precautions should be taken to avoid bitumen drippage where it can occur, such as steel decks. Provide a minimum face width of 4" to provide a transition of the roofing felts from the horizontal to the vertical face.

(L) Membrane Flashing:

(1) All membrane roof flashing shall be compatible with the manufacturer's installed system.

(2) Membrane roof flashing shall be provided at all vertical projections, roof perimeters, curbs, parapets, walls, roof penetrations and elsewhere as required, and should be properly designed and carefully detailed to provide a watertight installation.

(3) All membrane flashing at vertical surfaces shall extend a minimum of 6" above the top of the cant strip (10" above the roof surface if a 4" cant is used) and 8" onto the roof surface from the bottom edge of the cant. Do not hot mop the base flashing above the top of the cant strip. Bituminous membrane flashing shall be set in hand rubbed applications of industrial roof cement. The top edge of the membrane shall be sealed and metal counterflashing provided for protection. Do not surface mop base flashing of bituminous roof systems with hot asphalt.

(M) Metal Counterflashing:

(1) Metal counterflashing shall be provided over all membrane flashing where it occurs at vertical projections, parapet walls, equipment curbs, and the like.

(2) A two-piece locking type counterflashing shall be used in all masonry wall construction. The horizontal flashing part shall be laid in the wall during construction at the proper height. The vertical face of the counterflashing shall lock in place and be removable to facilitate maintenance and re-roofing.

(3) The counterflashing should be approximately 4" in height, have a hemmed edge and turn out at the bottom to form a drip edge. The counterflashing should never extend below the top edge of the cant.

(4) Refer to §2-1205(O) for the type, gauge, and quality of sheet metal to be specified and used.

(5) Cast-in-place reglets are acceptable. Specify only non-deteriorating type metal. Surface mounted extruded aluminum anchor bars will be acceptable if no other method is feasible. Anchor bars shall be fabricated of non-deteriorating type metal, of sufficient strength and rigidity, have pre-punched, slotted holes for attachment, using heavy-duty fasteners. (Note: Plastic anchor pins are not acceptable).

(N) Sheet Metal Components:

(1) All metal components of the roof assembly shall be fabricated of a non-deteriorating metal free of dents, waves and blemishes.

(2) 24-gauge pre-finished sheet metal or Mill finish aluminum of .032" thickness (minimum) shall be the standard material used on buildings.

(3) Other non-deteriorating metals such as copper and stainless steel are acceptable.

(4) 24-gauge pre-finished sheet metal or .040" thickness aluminum is recommended for scuppers, guttering, down spouts and splash pans.

(O) Expansion Joints:

(1) Provide expansion joints in the roofing system wherever structural expansion joints occur, wherever structural framing or roof decks change direction or materials, and where roof areas dictate the need for an expansion joint.

(2) Provide additional expansion joints within the roofing system itself wherever the roof perimeter is interrupted by either a projection into, or out of, the major field of roofing to form an isolated segment of roofing at the same elevation and as may be required by the dimensional stability of the several components used.

(3) Curb type expansion joints, in lieu of low profile type, are desirable for purposes of maintenance and longevity. Treated 2x's should be used of sufficient height to install cant strips and membrane flashing of sufficient height for a watertight installation.

(4) Consider using, warranty permitting, metal expansion joint covers of .040" mill finish aluminum in lieu of neoprene expansion joints for all roof and roof-to-wall expansion joint conditions on state owned buildings. Hex-head fasteners shall only be used. Nails are prohibited.

(P) Roof Penetrations:

All roof penetrations shall be flashed as recommended by the roofing membrane or metal panel manufacturer furnishing materials for the particular installation and the recommendations of the National Roofing Contractors Association, based on the best, current roofing practice.

(Q) Roof Drainage:

(1) All roof drains are to be located at the low points of the roof deck. Areas drained should be limited so that no drain exceeds 4" diameter. Locate drains so that all roof surfaces may be readily drained (each side of expansion joints, and the like.). The roof drain itself should be set a minimum of 3/4" below the roof surface. Taper insulation in a 3'0" diameter around drains.

(2) Coordinate roof drain placement with drainage slopes so as to stay within acceptable limits according to manufacturer's recommendations. Install roof crickets between drains where required to properly drain roof areas.

(3) Roof drains shall be interior where possible in order to allow for future expansion of the building.

(4) Every roof shall have an appropriate overflow scupper or emergency roof drain to prevent flooding or roof failure should the roof drains become stopped up.

(R) Roof Protection Walk Pads:

(1) In most cases roof pads or walk boards are not recommended on roof except in extreme high traffic conditions that may include but are not limited to:

(a) Roof top protection walk pads are only recommended on roofs where mechanical equipment, flagpoles, penthouses, laboratory experiments, and the like, are located which required periodic maintenance and protection from daily foot traffic.

(2) Walk pads should be neatly laid out and designed in such a manner as to not impede roof drainage.

(3) 12" X 24" is the recommended size of the individual pieces of roof protection walk pads. Walk pads shall comply with and be installed per roof membrane manufacture's warranty requirements.

(4) Walk pads should be installed prior to aggregate surfacing, or, if smooth surface roof membranes, before the application of the coating.

(5) In many instances, simply adding an extra layer of membrane for walk paths and roof protection is preferred.

2-1205 ROOFTOP MOUNTED MECHANICAL EQUIPMENT (Self-contained heating and/or cooling package units and associated ductwork)

(A) Mechanical equipment shall not be located on the roof unless contained in a separate mechanical roof penthouse or submitted for approval in writing to the Section prior to the first plan review. Refer to §2-408 regarding unacceptable design configurations.

(B) In those instances where mechanical equipment is approved to be located on the rooftop, due to the building budget or design, the following guidelines should be followed:

(1) Rooftop equipment (defined here as self-contained heating and/or cooling package units and associated ductwork), which is elevated above a roof, shall be designed with adequate support and clearance. The larger a piece of equipment is, the more clearance it will require. Provide a minimum of 10" clearance above the finished roof surface and additional clearance as required sufficient to maintain and re-roof the building. Contact or refer to National Roofing Contractor's Association's "for recommended minimum heights of equipment and support systems above the roof.

(2) Rooftop equipment shall be adequately supported and attached to the structural system of the building.

(3) Provide vibration isolation, as required.

(4) Legs of equipment (of substantial size and weight) supports should be surrounded by a pitch pan filled with 1" of fast setting gypsum cement and topped off with a commercial Pitch Pan Sealer sloped to shed water. Lightweight equipment should be set on water-resistant treated wood blocking and secured to the roof structure (with metal straps) as needed for protection and safety.

(5) Protect pitch pans and pan sealants by installing watertight aluminum or pre-finished sheet metal umbrellas with drawbands attached to equipment support legs.

(6) Provide support for any piping or lightweight equipment on the roofs. Piping or equipment shall be supported by treated wood blocking set on an extra layer of loose membrane set in industrial roof cement on the roof surface. Electrical conduit shall not be surface run on the roof.

2-1206 MINIMUM ROOF SLOPES FOR POSITIVE ROOF DRAINAGE

(A) All state facilities of new construction shall be required to have roof surfaces, with a minimum slope of 1/4" per foot for positive drainage.

(B) Where possible, roof slopes shall be accomplished structurally, in lieu of large amounts of tapered insulation fill to reduce costs and weight on the structural system.

(C) Avoid excessive slopes (in excess of 1/2" per foot) in built-up and modified bitumen roof assemblies which cause slippage and bitumen run-offs. Use proper fasteners and bitumen for the slope of the roof and the type of roof assembly.

(D) On re-roofing of existing facilities, the roof slope may be reduced to 1/8" per foot. The existing roof should be surveyed for areas which pond water. These areas should be leveled or filled as required and practical for the type of substrate. Verify that equipment curbs, counterflashing heights, and the like, are of sufficient height for re-flashing after the installation of new tapered insulation and roof membrane.

2-1207 ROOF ACCESS REQUIREMENTS

(A) Roof access for inspection and periodic maintenance shall be required on all buildings.

(B) A lockable, factory produced roof access scuttle (minimum size 2'6" X 3'0") with an insulated curb and hinged door, shall be located as directed by the owner's representative in a convenient location such as a janitor's closet, mechanical equipment room, and the like.

(C) A heavy duty metal ladder (20" wide, minimum) shall be provided at all roof access scuttles. Bolt ladder to floor, wall, and scuttle curbing. Ladders shall comply with current OSHA requirements.

(D) Access to all roof levels shall be provided. Utilize lockable type doors, windows (of sufficient size), roof access scuttles or exterior mounted rungs or ladders to provide access.

(E) When re-roofing existing buildings, verify need for roof access and provide as needed. Coordinate locations with the owner's representative.

2-1208 WORKMANSHIP/QUALITY CONTROL

(A) Installer's Qualifications: Installers shall be recognized roofing contractors, specializing in the chosen system roof application, skilled and experienced in the type roofing required. In addition, installer shall be familiar with the specific requirements and methods needed for proper performance and workmanship in accordance with recognized standards of the industry and the manufacturer

(B) Pre-Installation Conference: A pre-installation conference shall be held prior to installation of any roofing and associated work on a state building. The pre-installation conference shall be initiated by the design professional at the proper time with a minimum of three (3) day notice for the following parties to attend:

- (1) Installer's representative (roofing sub-contractor).
- (2) General contractor's representative (where applicable).
- (3) Mechanical contractor's representative (where applicable).
- (4) Electrical contractor's representative (where applicable).
- (5) Deck installer's representative (where applicable).
- (6) Testing services representative (where applicable).
- (7) Design Professional.
- (8) ABA Construction Section representative.
- (9) Agency representative or project coordinator.
- (10) Physical plant or maintenance representative.

(C) Review the Following with All Concerned Representatives:

(1) Letter from manufacturer furnishing roofing system/roof warranty, stating manufacturer has reviewed job specifications and agrees to furnish warranty as specified.

- (2) Project requirements, drawings, specifications, construction details, and the like.
- (3) Material submittals, manufacturer's requirements for bonding (where applicable).
- (4) Deck condition, installation (where applicable).
- (5) Storage of materials.
- (6) Installers' set-up directions.
- (7) Safety considerations.
- (8) Protection of rooftop, building and grounds.
- (9) Scheduling of work.
- (10) Roof inspection, testing.
- (11) Weather limitations. Rejection of "phased" construction.
- (12) Application of materials/building and regulatory codes.
- (13) Clean-up.
- (14) Project close-out. A record shall be made by the design professional of the pre-installation conference discussions, the decisions and agreements reached, and a copy of the record shall be made available to each party attending

(D) Roofing Materials Delivery and Storage Requirements Delivery:

- (1) No materials are to be delivered to the site prior to approval of the materials submittal, the pre-installation conference, and the owner's representative's approval.
- (2) No materials are to be delivered to the site without the proper arrangements for placement, storage and protection from the weather.
- (3) Agencies and their representatives are instructed not to accept delivery or be responsible for acceptance.
- (4) Deliver materials in manufacturer's original containers, dry, undamaged, seals and labels intact.

(E) Sheet Material Storage:

- (1) Storage of all sheet materials (roll goods) and insulation shall be subject to the following requirements: If within 50 miles of contractor's warehouse: All sheet materials (roll goods), insulation, and the like, shall be trucked to job daily from enclosed warehouse storage.
- (2) All other storage shall conform to the following:

(a) Enclosed trailer, vans, or truck storage on the project site.

(b) Canvas (no plastic sheeting is acceptable) tarpaulins, with material on wooden pallets, 6" minimum above the ground, secured by ropes, top and sides of all material protected from moisture and rain.

(c) Bitumen may be stored separate, adjacent to kettle location.

(F) Rejection of "Phased" Construction:

(1) The installer shall not "phase" the application of the roofing system. The roof system components shall be applied consecutively as recommended by the manufacturer (within the limits of a days work, and be weather-tight so that in the event of inclement weather, no damage will occur to the roof components or interior contents of the building. "Phased" roof construction will be rejected by the owner's representative and shall be removed and replaced by the installer.

(2) Final surfacing of aluminum coating, where applicable, may be delayed until the roof membrane cap sheet has properly weathered. Allow owner's representative time to inspect roof surfaces, all roof surfaces shall be clean and dry for approximately 48 hours prior to application of final surfacing.

(G) Weather Condition Limitations:

(1) Proceed with roofing and associated work only when weather conditions will permit unrestricted use of materials and quality control of the work being installed, complying with all requirements of the specifications and recommendations of the roofing materials manufacturers, without "phased" construction.

(2) Proceed only when the installer is willing to guarantee the work as required and without additional reservations and restrictions. Record decisions or agreements to proceed with the work under unfavorable weather conditions, and contact ABA, Construction Section. State the reasons for proceeding and the names of the persons involved in the decisions, along with changes (if any) in other requirements or terms of the contract.

(H) Protection and Clean-Up

(1) Rooftop Protection and Clean Up

(a) Protect roof surfaces over which work is to be performed.

(b) Exercise care and caution that roofing materials placed on rooftop do not overload structure, or damage decking or other roofing materials.

(c) Take care to prevent bitumen, aggregate and debris from running into and clogging roof drains and rainwater conductors. Remove trash and debris promptly.

(d) Schedule work in order not to track over and damage newly installed roofing in place. If absolutely necessary to cross a newly applied roof area, coordinate exact protection procedures with owner's representative.

(e) The installers shall be responsible for all damage to any related items to his trade and will be responsible for the cleaning and repair or replacement of any such items.

(2) Building Protection and Clean-up:

(a) Properly and efficiently protect building and work of other trades from damage by roofing materials during the performance of the work.

(b) The installer shall protect building walls and other surfaces from disfiguration by bitumen stains, runs or spillage, etc. and the installer shall bear the labor and material costs for repair of these surfaces from damage by the roofing installer's work.

(c) Protection of the building and its interior contents is mandatory. The installing contractor shall submit a written plan for providing this protection to the owner's representative for approval. The installing contractor shall furnish plastic sheeting to protect computers, word processors, printers, typewriters, and any other sensitive equipment in the building.

(d) It is suggested, and may be necessary, for the installing contractor to contract with the Agency's designated employee(s) (custodial or physical plant) for after hours clean-up and protection.

(3) Grounds Protection and Clean-up:

(a) Coordinate access, parking, storage of materials and equipment on the grounds with the owner's representative designated at the pre-installation conference.

(b) Protect the grounds, lawn, landscaping, shrubbery, and the like, from abuse and damage during roofing work.

(c) Remove trash, debris, wrapping, and the like, promptly and clean up daily around the job.

(d) The installer shall be responsible for removing all equipment and surplus material from the grounds prior to final acceptance of the work. Installer shall leave his portion of the work, as specified, clean, and in complete order. Upon final completion, the ground shall be cleaned of all trash, debris, gravel, bitumen, lumber, scraps, and the like, and the grounds raked to conditions prior to roof work.

(l) Installer's Guarantee

(1) Terms: Upon completion of all work and as a condition of its acceptance, deliver to the owner a written guarantee signed by the general contractor and the installing sub-contractor agreeing to correct all leaks and defects in the roofing system work.

(2) Time Period: The time period for correction of the roofing system work shall be two (2) years from the date of final acceptance of the roof by the owner's representative and ABA. Sixty (60)

days before the end of the two-year period, review roof conditions of the site with the owner and all parties concerned and correct all defects in conformance with the original specifications

(3) Warranty Repairs: During the correction of work period, the roofing installer shall, upon notice from the owner, make immediate temporary repairs and notify the roofing materials manufacturer, a report made, and, if covered by this guarantee or the roofing materials manufacturer's guarantee, the roof shall be permanently restored to a water-tight condition, at no cost to the owner.

(J) Manufacturer's Roof Warranty

(1) A Manufacturer's Warranty shall be required on all re-roofing, new construction, and associated roof work on a state buildings unless the cost and size are very minor. General: Specified work shall be guaranteed by the roofing materials manufacturer for a period as specified (maximum term and maximum penal sum available) starting from date of final acceptance by the owner, of the completed roofing system. The materials manufacturer shall approve the roof warranty. Surety company bonds are not acceptable. Submit one (1) copy of the roof warranty on manufacturer's standard printed form to the Agency, upon acceptance of the roof.

(2) Specified work shall be inspected by qualified representatives of the manufacturer during its installation and at final completion, for conformance to manufacturer's warranty program. Minimum follow-up inspections shall be made in accordance with the manufacturer's requirements and corresponding observations and reports provided to the owner.

(K) Installer's Warranty Signs

(1) Provide 10" X 12" minimum size painted signs (quantity of signs as needed or specified) made of aluminum with a light color background and letters of a contrasting color. Use paint that is compatible with the aluminum. Make the sign to read as follows:

"DO NOT MAKE REPAIRS OR ALTERATIONS TO THIS ROOF" without the written approval from the Agency's authorized representative. This roof is maintained until (insert the date, month and year, two years after date of final acceptance), by (insert contractor's name, address, and telephone number).

(2) Permanently post signs as directed by the owner's representative. Provide as least one (1) sign on each roof of the building where new roof work occurs.

(L) Roof Inspections/Roof Cuts

(1) The design professional's specifications, based on the manufacturer's recommended installation procedures, when approved by the owner and ABA, will become the basis for inspecting and accepting or rejecting actual installation procedures used on the work.

(2) Roof Inspections: Provide safe access to the roof for proper inspection by the owner's representative. Notify the roofing materials manufacturer whenever roofing work is to be done in sufficient time to arrange all inspections necessary for bonding of the roof system. Keep the owner's representative and Construction Section, informed of the status of the project and schedule for completion.

(3) Roof Tests, Roof Cuts:

(a) Roof cuts will be made only when considered absolutely necessary to determine compliance with specifications.

(b) When necessary, cut 4" X 42" test samples (to cut a total cross-section of all roof plies), of installed roofing as directed by the owner's representative. Immediately repair roof to conform to adjacent roof construction without cost to the owner.

2-1300 FUNDAMENTAL MECHANICAL AND ELECTRICAL REQUIREMENTS

These requirements apply to new construction and renovation projects only. Existing conditions or systems are exempt these requirements. Agencies are encouraged to upgrade existing systems to meet these requirements as much as practical when equipment or system components are replaced.

2-1301 GENERAL REQUIREMENTS:

(A) Mechanical and Electrical systems should be appropriate for the intended application regardless of the geographic location in the state. Location should be considered from a standpoint of availability of a competent service organization. Where critical replacement parts cannot be delivered within 24 hours, consideration should be given to inventorying these parts on-site. However, it is not the intent of a capital improvement project to stock the Agency's supply shelves. Other sources of funds are available for that purpose.

(B) Systems shall be capable of meeting the intended operational parameters of the application year round without requiring special seasonal reconfigurations. Controls should be clearly labeled and described so as to allow the operator to manage the system with a minimum of training. In all new system specifications, include a specific training time and course outline for the contractor to provide to Agency personnel. It is recommended that all training classes on the control systems and the system operational concepts be supplemented with videotape information or with compact disk interactive training aids. This data should be customized for the particular application to avoid confusion and promote operational awareness.

(C) New design concepts, equipment and materials should be carefully evaluated before incorporating them into a State project. While agencies are not discouraged from incorporating new and innovative solutions to design problems, state projects should not be used as the proving grounds for new concepts or ideas. Therefore, if an Agency desires to try to new design concept or material, the Section may approve such applications for the intent of observation to determine the suitability of such applications for other projects. Agencies shall submit a written request for approval to the State Engineer for use of such new concepts or materials. The request shall include but not be limited to the following information:

(1) A detailed description of the application or material.

(2) Backup literature from the manufacturer or supplier.

(3) A discussion of how this application differs from other applications utilizing conventional concepts or materials. Include the unique features of each situation that have lead to selecting this concept or material.

(4) A discussion of the expected cost difference between the conventional systems and the proposed systems.

(5) A discussion of what benefits the Agency expects to achieve over the conventional systems approach.

(6) A discussion of how the Agency expects to monitor the application for verification of expected results.

2-1302 MECHANICAL SYSTEMS

(A) Air handling units, pumps, boilers and other mechanical equipment requiring frequent inspection and service should be located within the building or in separate buildings with interconnecting chases or pipe tunnels. Equipment shall be located in rooms with ample space to provide routine maintenance, component replacement, operation and inspection without requiring demolition of the building structures or unnecessary climbing or crawling by service technicians or mechanics. Equipment located outdoors should be installed on the ground on solid foundations with concrete service pads around the equipment.

(B) When equipment must be installed on the roof, provide raised equipment platforms that allow roof replacement and maintenance or full perimeter curb to eliminate the need to re-roof under the equipment. Equipment shall be selected with water tightness of the roofing system in mind. Equipment that is prone to allowing leaks to penetrate the unit casing, interiors or connections during normal and wind blown rain shall be avoided. Where equipment is mounted above the roof, provide a service platform on the service access sides of the equipment. Provide stairs that are integral to the platform to avoid the need for ladders to gain access to the work platform. Conform to OSHA safety requirements with regards to platforms, ladders, confined spaces and the like. When it is absolutely necessary to have piping, conduits, ductwork, etc. across the roof, specify "zero penetration support systems with non-rusting base supports to distribute the equipment weight without damage to the roof membrane or insulation. Ensure that the installed system will resist the design wind loads without damage to the supported system or the roof.

(C) Air handling equipment should be specified with access doors with view ports between each major section or component to allow inspection of the operating equipment without requiring the shutdown and opening of the unit. Provide internal lights with exterior mounted pilot light switches on units exceeding ten (10) feet in width or height. For package split-system equipment, provide a means to remove and clean the cooling coils and heating coils without requiring complete dismantling of the system.

(D) Mechanical air conditioning system should be specified with the highest operating efficiency permitted by the project budget while still allowing for competitive bidding. Minimum acceptable seasonal energy efficiency ratio (SEER) shall be 12.0 and minimum energy efficiency ration (EER) shall be 10.0 Indirect, gas-fired heating equipment shall have a minimum annual fuel utilization efficiency (AFUE) of 80%. Agencies are encouraged to require higher efficiencies

(E) The use of alternative energy sources for both heating and cooling are encouraged. Agencies should consider the effects of diversity and quantity aggregation on their ability to negotiate utility rates and their ability to provide uninterrupted service at an affordable cost to the State.

(F) Mechanical systems shall meet the requirement of the Arkansas Energy Code, (ASHRAE Standard 90.1 for energy efficiency) and the ASHRAE Standard 62 for indoor air quality. Equipment shall be selected to meet these requirements without requiring the equipment to operate outside of the manufacturer's recommended performance envelope during the extremes of summer or winter. Operation of the equipment during these extremes should not shorten the intended life of the equipment or sub-components.

(G) Mechanical system designs should be conducive to promoting good indoor air quality. Air equipment subject to exposure to condensed moisture should be constructed of materials that do not promote or support biological growth. These surfaces should be sloped to a drain point that will readily remove the moisture from the system. These surfaces should be easily accessible for periodic inspection and cleaning. The remainder of the system should also be readily accessible for inspection and cleaning. Filter selections in air systems should consider not only the particle size to be arrested but also the possibility of odor transmission through the system. Frequency and cost of replacement media should be considered however, the cheapest filter media is often the least desirable from an air quality standpoint and a frequency of replacement standpoint. Unless otherwise specified by the Agency or dictated by the specific application, all HVACR systems shall maintain the space temperature and humidity within the bounds of the "comfort envelope" as defined by the ASHRAE Fundamentals Handbook. This comfort envelope is generally accepted as a region where the indoor temperature and humidity will be acceptable to the majority of the occupants.

2-1303 PLUMBING SYSTEMS:

(A) Plumbing systems shall be designed pursuant to all state and federal laws and regulations.

(B) Back-flow prevention shall be applied to each project as required to protect the public water supply and the interior building distribution systems from the potential for cross contamination from a non-potable or contaminated source. Many building projects will require an approved back-flow prevention device to be installed on the incoming water service prior to the first connection tap. In addition, all connections to mechanical systems or equipment shall be provided with an approved back-flow prevention device at the connection to the equipment or at the point where the dedicated piping system for makeup water begins. Back-flow devices shall be installed in accessible locations and provided with an adequate drain connection to allow proper operation and inspection.

(C) All fire sprinkler services and standpipe systems shall be installed with an approved back-flow prevention device.

(D) All lawn irrigation systems, agricultural/aquatic operations and wash racks shall be provided with an approved back-flow prevention device to protect the public water supply and eliminate cross connection contamination within the facility.

(E) All heating water equipment shall be selected for energy efficient operation. Gas fired heating equipment shall have a minimum AFUE rating of 80%.

(F) All plumbing fixtures shall be selected and installed in a manner that is conducive to ease of cleaning of the fixture, support, and surrounding area. Cleanliness promotes good indoor air quality and a healthier indoor environment. System designs should not result in wet, damp or pooling water, which can be a source of microbiological growth or promote the formation of mold and mildew if left un-cleaned.

2-1304 ELECTRICAL SYSTEMS:

(A) Electrical distribution systems shall be designed to allow rapid comprehension of the basic system layout. Where multiple voltages will occur within a space or structure, careful consideration should be given to the layout, routing, labeling and color coding of conductors and components to minimize potential injuries due to confusion of the various systems.

(B) Where three-phase power is available, utilize this power for larger motor loads.

(C) The use of copper conductors and copper busses is recommended. Where aluminum conductors are to be considered, ABA recommends that aluminum not be used on branch circuits below the distribution panel level. ABA recommends that all terminations on aluminum conductors be made with bolt-on or weld-on lugs only. Panel-board termination bars or lugs utilized with aluminum conductors should be made of copper, cadmium or other approved materials rated for use with aluminum or copper.

(D) Where buildings are provided with a 480/208/120 volt system, perform an economic analysis of the cost benefit of 277 volt lighting verses 120 volt lighting.

(E) Specify lighting fixtures, lamps and ballast for energy efficiency and to minimize the amount of hazardous waste that may be generated by the Agency during routine maintenance replacement.

(F) Specify high efficiency transformers when the transformer losses are included in the utility metering. Utilize transformers that are operationally stable at the anticipated operating conditions.

(G) Where critical operations include electronic equipment or computers, utilize transformers that minimize harmonic distortion or provide electrical isolation of susceptible equipment or circuits. Provide neutral conductors sized for 200% of the line conductor capacity.

(H) Provide a minimum of 10% spare circuit capacity at each panel to allow future growth. Provide a minimum of 25% growth capacity on wire management system for each systems future growth.

(I) Circuits serving critical loads or equipment should be provided with a minimum ride through capability to allow continuous operation of the equipment or component during nominal dips in power to 70% of RMS voltage and for momentary outages of 1/2 cycle or less.

(J) All new construction shall be evaluated for lightning risk hazard in accordance with the procedures outline in NFPA 780.

2-1400 FUNDAMENTAL CABLING SYSTEMS REQUIREMENTS

(A) The following sections pertain to the planning, installation, maintenance and documentation of the various new cabling systems of 90 volts or less in state owned buildings.

(B) The development, installation and management of cabling systems presents many unique problems for building managers and operators. Agencies shall endeavor to ensure that each system is properly designed and installed to minimize the potential for problems to develop. Therefore, building operators and managers shall maintain up to date documentation of each

cabling system to allow proper maintenance, identification of system components and coordination with other projects. When systems are abandoned, the Agency shall require the obsolete cabling to be removed from the premises.

(C) Projects subject to the jurisdiction of the Arkansas Department of Information Services (DIS) shall be coordinated with DIS at the earliest opportunity. The Agency Project Coordinator shall notify DIS of the project. Comments or requirements of DIS should be incorporated into the project design in a timely manner. Copies of all comments or requirements shall be forwarded to the Section with the plan review submittal. When DIS is responsible for providing telephone or data services or for arranging the activation of these services, agencies shall allow ample time in the construction project for this coordination. Agencies shall promptly inform the Section and DIS of all changes in the project scope and schedule to avoid delays.

2-1401 PLANNING REQUIREMENTS

(A) The following types of cabling projects are not considered capital improvements and are not subject to this policy:

(1) Cabling between components of a system which is routed exposed in the space and passes between components (i.e. cabling between the computer and peripherals on the workstation).

(2) Cabling routed exposed in the space between the system component and the network connection (i.e. the telephone or computer on the workstation and the network outlet in the wall, floor, or ceiling).

(3) Cabling routed exposed in the space between system components for television, radio, and satellite broadcast or audio/visual systems.

(B) All other cabling projects, including the systems above when routed concealed or in conduit, are considered capital improvements subject to State and Federal laws and regulations.

(C) All cabling projects contracted independently or that are part of a larger project which exceed the amounts established in Ark. Code Ann. § 22-9-101 shall have the plans and specifications prepared by a registered professional engineer licensed to practice in Arkansas. Conversely, projects below the limit set forth in Ark. Code Ann. § 22-9-101 requiring the involvement of a professional engineer; the plans and specifications shall comply with all other provisions of the MSC. Nothing in this policy shall prohibit agencies from utilizing the service of a competent registered professional engineer for these smaller projects.

(D) Plans for cabling projects shall be drawn to scale not less than 1/8" = 1'-0". Scaled drawings are necessary to allow for proper quantity take-off and verification. The plans shall show the location of the cable entry into the building, the location of the telecommunication room or termination board for the cable entry. The plans shall show the routing of the cabling between the termination board and the individual run out. Run outs shall be grouped or bundled to minimum the congestion above ceilings, below floor, or in other chase spaces. A single line may be used to graphically represent multiple cables in a run. Designate the quantity or types of cables in each run.

(E) Cabling systems should be planned with flexibility and growth in mind. Systems should be segregated and labeled to avoid confusion and accidental cross connection. Face plates and

jacks should be color coded to facilitate user connection of equipment to the appropriate systems. In facilities where frequent reorganization of spaces occur, the location of outlets should be reviewed to ensure an adequate number of outlets are installed in each space to accommodate minor reorganization without requiring a major re-cabling project.

2-1402 TELECOMMUNICATION ROOMS

(A) In new construction project or major renovation project, provide at least one wiring room on each floor in each building. Rooms should be located as near to the center of the floor as practical. In multistory buildings, stack the telecommunication rooms above one another to allow vertical wiring chases between floors.

(B) For very large buildings or buildings where it is not practical to locate the rooms near the center of the floor, provide 2 or more rooms per floor. Wiring rooms should be located such that the length of cabling between the telecommunication room and the most remote outlet face plate is no more 100 meters (330 feet), for data networks or the maximum cable length recommended by the system manufacturer for other types of systems.

(C) Telecommunication rooms and cabling termination rooms shall be a minimum size of 8 feet by 12 feet (not just 96 square feet). For systems containing more than 100 faceplate outlets, the minimum room size shall be 10 feet by 15 feet (not just 150 square feet). For projects containing multiple wiring systems, (i.e. data, telephone, public address, security, and CATV.) the Agency shall review the cable installation requirements and should increase the minimum size of the room or provide separate wiring rooms for each system. When system terminations can be consolidated into one room, the maintenance and management of these systems is simplified.

(D) Many cabling systems include components that require strict environmental controls. Review these requirements and provide the appropriate air-conditioning and power quality services. Many systems require redundant cooling or power, which may necessitate additional capital cost during the installation. Review these requirements and identify them during the planning stage.

(E) Recommend a minimum of eight (8) electrical duplex outlets (2 on each wall) on isolated electrical circuits in each room. These outlets should have isolated ground conductors and dedicated neutral conductors. Isolated outlets should be color coded for positive identification (i.e. orange). Recommend at least 4 general power duplex outlets (1 on each wall) for power tools. These outlets should not be on the same panel board or circuit as the electronic equipment in the room.

2-1403 CABLING STANDARDS

All cabling shall conform to the latest industry standards applicable to the specific system at the time of installation. Cabling not installed in a closed conduit system should be specified to be plenum rated cabling regardless if the space is a return air plenum or not. This will eliminate the need to replace the cabling system if the HVACR system is renovated to a return plenum system. In addition, plenum rated cabling generally develops less smoke and has a reduced flame spread in the event of a fire thus improving the fire safety of the building.

2-1404 WIRE MANAGEMENT

(A) Efficient wire management can be achieved with a properly planned wire management system. Cable trays or “J” hook systems should be installed in all major corridors and hallways. For large projects with multiple cabling systems, provide multiple cable trays, divided trays or multiple hook systems to allow segregation of each cable system. Cable management systems should be provided with a 25% growth capacity for each cable system.

(B) Cable trays and hooks shall be attached to building structural members or wall framing systems only. Do not attach or support wire management systems from other building systems such as HVACR, piping, conduit systems or ceiling support wires. Extend wire management systems into the ceiling areas of all telecommunication rooms or cable termination rooms. Cable trays should run the length of the room along the center of the room. Where possible, extend conduit from the back box to the corridor ceiling where the wire management system runs. Provide plastic bushing at conduit termination to minimize damage to cable jacket.

(C) Provide pull boxes and long sweep elbows in conduit systems to facilitate cable pulls. Pull boxes shall be at a maximum spacing of 300 feet in outdoor conduits without bends. If one or more 90° bends are included in a run, reduce the maximum spacing to 100 feet.

(D) Provide spare empty conduits with each exterior run and with runs between floors or wiring rooms. Recommend a minimum of two (2) four-inch conduits be provided as spares in new construction or major renovations. Provide pull cords in each conduit to facilitate future cable installation.

2-1405 IDENTIFICATION

(A) Each cable system shall be clearly labeled as to the type of service the system provides. Agencies are encouraged to develop a standard practice for labeling and identifying cabling both in conduit and exposed. The following is one recommended scheme of color coding cabling and conduit to facilitate quick recognition of various systems. Other industry standard schemes are acceptable.

System Type	Color Code
(1) Data cables	Blue
(2) Data (fiber optics)	Orange
(3) Fire Alarm	Red
(4) Telephone (voice/fax/modem)	White
(5) Security	Yellow
(6) Sound, Paging, Music	Gray (with label)
(7) Access control	Black (with label)
(8) CCTV	Black (with label)

(9) CATV	Black (with label)
(10)Satellite	Black (with label)
(11)Building Automation Systems (BAS)	Black (with label)

(B) Pull box and junction box cover plates inside buildings should be color-coded the same as the system cable. The name of the system should also be labeled on the cover (i.e. "CATV").

(C) Terminal boards, punch down panels, and cabinets should be labeled as to system type. In addition, clearly identify the point of demarcation between the building cable system and the utility connection point. Include the name of the service provider, phone number, contact person (if known) and the account number to facilitate service calls and coordination.

(D) When empty non-metallic conduit systems or systems containing fiber optic cable or other non-traceable cables are installed below grade, provide a metallic tracer wire inside the conduit or immediately above the conduit or a detectable trench tape to facilitate future locating of the conduit.

(E) A cable labeling system should be developed by the Agency to facilitate tracking and trouble shooting after installation. As a minimum the cabling shall be labeled on both ends and at junctions to identify where the cable originates and where it ends.

2-1406 DOCUMENTATION

(A) Building managers/operators should maintain a complete record of each cabling system. The record should include the "As-Built" drawings, cable test/certification reports, system start-up records, catalog-cut sheets of cable and accessories, name of the installing firm, phone number, and copies of all warranties.

(B) As-Built drawings should show routing on scaled drawings. The route and identification number of each cable should be clearly shown as well as the location of all wiring rooms, front end equipment and demarcation points. Drawings should include riser diagrams or schematics to facilitate rapid understanding of the system and trouble-shooting.

(C) Where continuity or performance testing is required, the record documentation should include the specifications for the test, the data points gathered during the test and the results of the test. All problems identified during the test and all deviations from the specification requirements should be clearly outlined and discussed in a summary at the front of the report. Include copies of all certificates or letters of certification in the front of the report.

(D) Documentation should include the "approved submittal drawings", catalog cut sheets, or shop drawings for all components. Submittals should be bound tab and divided into discrete system components. Include the name of the installing firm and phone number. Copies of warranties and guarantees should also be included in the manual. The documentation should also include a listing of the manufacturers recommended spare parts by name and product number.

2-1500 PLAN REVIEW REQUIREMENTS

The following guidelines pertain to the submittal of construction documents to the Section for review. (See §2-410 for additional responsibilities and duties of the Agency.)

2-1501 PLAN REVIEW AUTHORITY

(A) The Section reviews capital improvement construction documents for compliance with the MSC during its normal review of capital improvement projects. Such review does not relieve the Design Professional from the responsibility for designing in accordance with state and federal laws and regulations. While the Section endeavors to provide a thorough review of the documents presented for review, the Section shall assume no liability for the completeness, accuracy, or constructability of the documents approved for bidding. The Section approval for bidding implies only that the documents reviewed contain the minimum amount of information required to achieve a reasonably accurate price for the actual value of the work contemplated.

(B) While some code reviews are performed under the terms of various Memoranda of Understandings between ABA and the Agency or authority having jurisdiction, the review provided by ABA does not relieve the Design Professional from the responsibility for full compliance with these codes and good design practices.

(C) The Section reserves the right to reject a submittal for incompleteness, unacceptable design configuration or failure to meet the requirements of the Arkansas Fire Prevention Code or other applicable codes, rules, or standards, or if the submittal lacks the detailing or information necessary for proper review and bidding.

2-1502 PLAN REVIEW SCHEDULE

(A) Plans shall be submitted for review when the documents are 100% complete and considered ready for bidding or construction. (Refer to § 2-201).

(B) Nothing in this policy shall prohibit an Agency from requesting additional plan reviews at the schematic design and design development phases of production. The Section will provide review commentary to aide the Agency in assessing the appropriateness of the design and to ensure the design process remains on track for timely completion. All requests for additional reviews shall be submitted in writing to the Section for approval.

(C) Design Professionals may request a preliminary review of the project or portions thereof to ensure that the design direction chosen will result in a review submittal that will meet final review requirements. Request for such review meetings shall be submitted in writing to the administrator of the Section and shall include a brief description of the topics to be discussed

(D) The Agency shall schedule a minimum of thirty (30) calendar days for the plan review process. If the submittal is deemed to be incomplete, the review time will be stopped and the Agency Project Coordinator will be notified in writing of the discrepancies and given an opportunity to provide the additional information. The review time will recommence upon receipt of the additional information in its entirety.

(E) The Agency shall respond to all ABA review comments in writing and shall submit one set of corrected plans and specifications with the responses to the comments. ABA shall review the

responses and verify that all commentary has been satisfactorily addressed. The Agency shall schedule a minimum of 5 working days after receipt in the Section for this review. If additional commentary is necessary, comments will be issued in writing and this process will be repeated. If no additional comments requiring additional review are necessary, the project will be released so that the bidding or contracting process can begin.

2-1503 PLAN REVIEW SUBMITTAL REQUIREMENTS

(A) While exceptions may occur, the following represents the minimum documentation required for most capital improvement projects.

(B) Provide two (2) complete sets of all submittal documents and correspondence. One copy shall be in paper form and one copy shall be in electronic form. The electronic copy shall be submitted to the Section in a readable format which is acceptable to the Section such as Adobe Acrobat PDF format on one or more compact disks.

(C) Only documents that are considered 100% complete shall be submitted for a review. These submittals shall be ready to issue for bidding without requiring additional notes, details or other work. Do not submit projects that are less than 100% complete. Plans and specifications approved, as a final review should not require extensive or lengthy addenda to complete or change the scope of work and should not result in excessive change order requests due to uncoordinated documents or lack of information.

(D) The following documents shall be included in the ABA Review Submittal.

(1) A completed copy of the ABA Review Submittal Cover Sheet.

(2) Transmittal letter from the Agency Project Coordinator indicating that the information contained in the submittal package has been reviewed by the Agency, that the information complies with the project program and the final cost estimate is within the Agency's project budget as described in the certification of available funds or the Method of Finance (MOF).

(3) One (1) copy of the professional services contract containing the initial contract, attachments and amendments. For projects executed under multiple-projects type contracts, include a copy of the task order assignment, delivery order or letter of assignment issued to the design professional for this assignment. If the design professional was engaged under a purchase order (in lieu of a standard contract form), submit a copy of the purchase order and attachments describing the services to be provided.

(4) An updated statement of the final estimated construction cost. Cost figures should be broken down by Division and Section or sub-system components such as paving, windows, millwork, painting, and the like, as required to determine an accurate projection of cost. As a minimum provide a line item for each of the CSI Divisions and for the General Conditions contained in Division 0.

(5) A copy of the Agency program provided to the Design Professional along with any revisions and a copy of any pertinent meeting notes reflecting a change in the scope of work since the first submittal to the Agency. Include a copy of the funding source noting any revisions since the first submittal.

(6) If a feasibility study or pre-design study was performed, submit a copy of the ABA approval letter for each study.

(7) Provide complete Project Manual containing all appropriate CSI Division specifications including Division 0 and the Invitation to Bid. Be advised that a separate submittal of the Invitation to Bid, Division 0 and Division 1 specifications to the Construction Section will be required upon approval of the plan review submittal.

(8) Provide complete drawings as shown under §2-1504. All drawings and the project manual shall be stamped and signed by the appropriate Design Professional. Provide a preliminary or Not-for-Construction over stamp of the Design Professionals seal.

(9) Submit copies of approval letters from all regulatory review agencies.

(10) If the project site will be located in a floodplain, submit a copy of the permit application to development in the floodplain in accordance with § 2-700 et. seq.

2-1504 PLAN REVIEW DRAWING REQUIREMENTS

(A) Title Sheet (T1)

(1) Title of Project.

(2) Location of Project.

(3) Name of Agency.

(4) List of all design consultants, with phone numbers and addresses.

(5) Arkansas Fire Code Prevention Certification Statement.

(6) QC Review Statement

(7) ABA Agency Project Number

(8) Agency Project Number (if different than ABA assigned number).

(9) State Location Map

(10) Vicinity Maps of City and Campus.

(11) Arkansas Fire Prevention Code Analysis Data.

(a) Occupancy Classification

(b) Minimum Occupant Loads

(c) Type of Construction

(d) Allowable Height

(e) Allowable Building per Floor

(f) Gross Floor Area for Each Floor of all Buildings

(g) Net Floor Area for Each Assembly Occupancy Classification

- (h) Horizontal Separation Distances
- (i) Exit and Access Corridor Protection Strategy
- (j) Seismic Design Category
- (k) Seismic Use Category

(12) Index of All Drawings in the Project. (For large projects, the index of drawings and other information may be placed on Sheet T2).

(B) Topographical Surveys & Plot Plans (TS):

(1) Survey shall meet the Arkansas Minimum Standards for Property Surveys and Plats". A registered land surveyor licensed to practice in Arkansas shall stamp and sign these plans.

(2) Where required by the scope of the project, provide a legal description of the subject property.

(3) Show property lines and surrounding features affecting future development.

(4) Show the location of all known easements, flood plan boundaries and other features that will limit or prohibit development of the site. Note the elevation of the 100-year floodplain on the plan and define the perimeter or extent of this elevation with a bold line. (Recommend you shade or crosshatch a screened pattern within the boundaries of the flood plan for clarity). Include a source data reference on the plan identifying where the flood plan information was obtained.

(5) Show contour elevations at minimum of 5-foot intervals for undeveloped areas of the site and 1 foot or 2 foot intervals within the project limits as necessary to accurately describe the site terrain. Indicate the path and contour of all existing surface run off drainage into and out of the site.

(6) Show the location of existing utility lines, materials, and sizes and surface features. When underground utilities are shown and could not be verified during the survey, provide a disclaimer statement on the plan noting the source of the assumed information. When information is derived from public utility records, include the location of the record archive, a contact phone number and the plate or drawing record from which the information was taken.

(7) Show the locations of existing buildings, towers, tanks, wells, pads, old foundations, drives, lots and the like.

(8) Show the location, size and type of existing means of access to the site. Where bridges, trestles, or other load limit or height limiting structures are located along the access routes note the posted load limit or height restriction. Where height restriction exist and are not posted (such as utility line crossings, and the like, determine the minimum clear height under the structure at the center of the road or access drive. Where gravel or paved roads are shown on the plans identify these roads by their official name or designation number (i.e. Country Road 69).

(9) Show location of permanent monument markers on the site and the coordinate information describing the monument location.

(10) Show location, size, and type of all trees greater than 3 inches in diameter within the project limits. Show other prominent trees or vegetation on the plan site that may affect the project development. Where heavily wooded or bushy areas exist, define the approximate profile of the perimeter of these areas and note as heavily wooded, wooded, bushy, marsh, swamp or the like.

(11) Provide a north arrow and a plan scale in a prominent location on the plan. The preferred location is the bottom center of the plan sheet or the lower right-hand corner of the plan sheet.

(C) Boring Logs and Soils Data

(1) Provide a small-scale plan of the site and building showing the location where samples were taken. Distinguish between borings and test pits.

(2) Indicate the surface ground elevation, the depths of each boring or test pit, and the blow counts per ASTM D-1586 at each bore.

(3) Note the classification/description of materials encountered. Indicate the ground water level at each boring or pit. Note the general site conditions and recent weather history if known (i.e. heavy rains in general area over the last month, and the like.) Include other pertinent data.

(4) Provide a brief description of site geology and subsurface conditions encountered.

(D) Demolition Drawings

(1) Show the location of all existing elements that will affect the work or be used as a reference point.

(2) Clearly define elements that are to remain after the demolition is complete. Coordinate the location of this information with the new construction plans to avoid omissions or errors.

(3) Clearly define the beginning point and the ending point of the demolition work. Where possible, provide a flag symbol indicating these points.

(4) Clearly state on the drawings how the demolished materials are to be disposed. If materials or equipment are to be retained by the owner, clearly identify these items and note where the removed item is to be stored. Avoid using the phrase "Owner has the first right of refusal on demolition materials." Coordinate this activity with the Owner prior to issuing the plans.

(5) Clearly indicate all temporary and permanent closures of penetrations in building envelopes. Indicate temporary or permanent backfill requirements where demolition opens the existing site or removes structures.

(6) Clearly note the size, location, and type of material for piping systems, electrical systems, and the like, that will be abandoned in place. Where possible in existing structures, require the contractor to label piping, and the like, that is to be abandoned with the date of the contract drawings i.e.: "Abandoned May 2000." Labels should appear on both ends of the abandoned system.

(E) Civil Site Drawings

(1) If the project is to be constructed on a newly acquired state property, provide a legal description prepared by an Arkansas Registered Land Surveyor or refer to the description provided on the Topographic Survey sheet if one is provided in the set of plans.

(2) Show the location of all adjacent buildings, tanks, structures, towers, and the like in the vicinity of the proposed building project. Show the location, size, and type of all trees greater than 3-inches in diameter that may affect the construction or access to the construction area.

(3) Show the location of the boundary of the 100-year Flood Plain as it relates to the project site. Show the elevation contour of the 100-year flood level. Lightly shade or crosshatch the area within the flood plain boundary and clearly indicate all new work within this area. Include a reference to the source of the data.

(4) Show the location of all known existing utilities and new utilities including the location of all connection points. Where connection to existing utilities are governed by the local utility company, provide the name and phone number of the local company. Provide connection details, temporary flushing details, and details for expansion and thrust blocking where applicable. Note that Arkansas One-Call is to locate all underground utilities as required by the Ark. Code Ann. § 14-271-101 et seq.

(5) Where roadways, driveways, parking lots, sidewalks, and other paved areas are to be provided, show locations of all control joints, constructing points, and expansion joints. Provide details of joints, turndowns, and reinforcing. Provide cross-section view of paving showing the sub-base and paving materials.

(6) Show existing grade contours as thin dashed lines and new contours as heavy solid lines. Where extensive cut and fill are required, show cut and fill cross-sections. Where roadways, driveways, and parking lots are to be constructed, show cross-sections and profiles as necessary to clearly define their construction. Where cut and fill are required, show location of designated areas on the site for surplus or stockpile materials. Show spot elevations at all critical control points and construction points. Note the finished floor elevation of the first floor located above grade. For buildings with basements or sub-levels, also include the finished floor elevation for the lowest level.

(7) Show the location of all drainage features on the site. For new construction, show the intended path of surface runoff drainage. Indicate the direction of flow by placing arrows in the direction of the flow. Where existing or new drainage structures occur, show the inverts in and out of boxes, drop inlets, manholes, and the like. For long runs of underground drainage piping provide plan and profile drawings indicating the depth of the piping and structures, the slope of the system and the cover depth above the system. Where the piping system material must change as the piping passes under a road or drive or where the system extends above grade to cross as low area or streambed, clearly indicate the change on the profile and the plan view.

(F) Landscaping Drawings

(1) Show the location of all landscaping beds, retaining walls, and water features. Include schedules showing the planting types and sizes. Indicate planting season limits and watering schedules.

(2) Show location and type of irrigation system heads. Show the head spray pattern and radius. Show the location of zone control valves, drain valves, and isolation valves. Show the layout of the piping distribution system. Show location of the connection to the public or private water supply and the approved backflow prevention device. Show location of all control panels and transformers requiring power above 24-volts. Show the location of the source power or refer to the appropriate electrical drawing for the location of main power and connections.

(3) For systems with future extension or potential for future growth, show the location of all sleeves under driveways, sidewalks, and lots as required to extend future services without cutting and patching paving.

(4) Provide staking details for all trees and shrubs that are not self-supporting. Provide installation details for each type of irrigation head, zone valve and, backflow prevention device.

(G) Fire Services Access

(1) Show locations of all buildings and structures around the project site.

(2) Show the location of all drives, roads, parking lots and sidewalks large enough to allow passage for emergency service vehicles.

(3) Show locations and types of all fences or barricade structures around the site that may limit access or impede evacuation in an emergency. Where gates are installed that restrict access to the building or site, provide a "Knox Box" that is keyed to the local fire department or emergency response service.

(4) Show the total square footage and number of floors on the building plan. Show the type of construction as determined by the Arkansas Fire Prevention Code.

(5) If specific areas of the site have been designated as areas of assembly or refuge for the building occupants, show the locations on the plans.

(6) Show the approximate location of the building entrances and exits, the approximate location of the following items if applicable.

(a) Fire alarm panel or fireman's service panel.

(b) Main power disconnect switch, or shunt power trip device.

(c) Area of rescue inside the building.

(d) Fire stair towers

(e) Elevator shafts.

(7) Show locations of all fire hydrants within 500 feet of any point on the building and within the area covered by the plan view.

(8) Show the location of the fire department connections, post indicator valves, and fire pump if applicable.

(H) Architectural Drawings

(1) Floor plan drawings shall be shown at a scale no less than $1/8" = 1'-0"$. For large buildings, use match lines to separate the building plan as required to fit this scale. For large buildings requiring match lines, provide an overall composite plan at a scale smaller than $1/8"$ to show the relationship of all areas to one another. Show the match line locations on this plan and reference the $1/8"$ scale plan sheet number for each area. Show the room name and number for each space. Show the detail marks, elevation marks, and door and window marks referenced to the door and window schedules. Provide legends, material notes and general notes as required to describe the work.

(2) Provide dimensional plans separate from the general floor plans as necessary to describe and dimension the size and relationship of the space and features. Dimensions may be shown on the general floor plans and enlarged plans provided the sheets do not become so cluttered as to be illegible or difficult to read.

(3) Provide larger-scale drawings for toilet areas, elevator lobbies, entry lobbies, special use rooms, and similar spaces where more intricate work is to be performed by the contractor. Drawings shall be shown at a minimum scale of $1/4" = 1'-0"$.

(4) Provide exterior elevations of all faces of the buildings. Elevations shall be shown at a scale not less than $1/8" = 1'-0"$. Elevations should indicate the building materials to be used, the texture of materials and the color of the finished surfaces. Where accent bands or features are used, provide clarification of the size, type and color. Show exterior features such as gutters, downspouts, railings, screens, construction joints, expansion joints, masonry control joints, and the like. Show locations of all building section cut lines, detail marks, and door and window marks. Indicate the relationship between the finished floor and the exterior grade. Show the floor to floor height by dimension. Dot in the footings or foundation.

(5) Provide at least one traverse section and one longitudinal section through each major axis of the building. These sections may be shown at a scale of $1/8" = 1'-0"$. Provide additional large-scale building and wall sections as required to properly understand and construct the building. Building sections shall clearly illustrate all building materials, sizes, spacing and attachment. Show all through wall flashings, roof flashings, flashings at slabs, floor and the like. Show the relationship between the floor slab and the footings or supporting structure. Note the finished floor elevation for each floor and the elevations of perimeter footings or upper floor supports. Show the relationship of the finished floor to the exterior grade. Show the location of perimeter insulation and foundation drainage systems. Indicate special feature details such as ceiling heights, furr-downs, coffered-ceilings, skylights, and the like. Provide details at each unique condition through the ceiling cavity where the relationship between the ceiling height and the structural framing changes the space available in the ceiling cavity for mechanical and electrical systems. Show the location of the vapor barrier or air barrier in each exterior wall section and roof section.

(6) Provide large-scale details of unique construction features of the building. Where special angle cuts are required on masonry materials, framing materials or finish materials, provide details at a scale large enough to clearly define the desired detail. Coordinate the plans with these details to ensure that the contractor can determine where these special cuts occur. Where special patterns are to be formed in the finish materials, provide large-scale plans,

elevations and details as necessary to describe the work. Provide large details of typical construction elements as necessary to describe the building construction.

(7) Provide door and window details as required to describe the size, style and installation of each unique door and window. Provide details showing the head, jamb and sill or threshold condition for each door or window. Details shall be shown at a scale large enough to show the framing and attachment requirements. Provide door schedules and window schedules in a graphic format as required to define the type, size, location, hardwood, finish, operation and accessories required for each.

(8) Provide a room finish schedule for each space in the building. Schedule should include the room number, name, location, floor material and finish, base, wall material and finish, ceiling cove, ceiling material and finish and any special trim or features. Provide notes as required to adequately describe the finish treatments desired. Provide references to the appropriate specification sections where additional information can be found.

(9) Where built-in furniture, casework or millwork is to be included in the construction project, provide large scale plans, elevations, sections and construction details as required to describe the size, construction, and finish of these elements. Provide detail reference marks as required on the floor plans and the millwork plans as required to accurately locate the details and the space where they apply. Built-in millwork should be designed to be as simply to construct, as the function of the millwork will permit. Where customized furniture is to be a part of the construction contract provide the detailing necessary to construct the piece. Clearly note all such pieces as "custom built" (i.e. "Custom Built Desk").

(10) Provide reflected ceiling plans for each floor (including floors with open structure). Drawing shall indicate the types of ceiling materials, pattern of layout and changes in elevations of the ceilings. Note the height above the finished floor for each section of ceiling. Show the location of all ceiling mounted devices such as light fixtures, air devices, access doors, speakers, sprinkler heads and similar devices. These devices shall be coordinated with the various discipline drawings to ensure that the contractor can install the sub-systems correctly. A reflected ceiling plan is not a substitute for properly coordinated plans.

(11) Provide a plan view of the roof system at a scale not less than 1/8" = 1'-0" or the same as the floor plan. Design Professional may request a waiver from this requirement for large scale projects where needed. Show the size and location of all expansion joints, roof drains, emergency roof drains, scuppers, overflow scuppers and roof vents. Show the pitch or slope for each section of the roof. Indicate the materials of construction and the color of the finish materials. Show the access to all roof levels. For multi-story buildings with roof mounted equipment requiring maintenance, provide at least 2 roof access points to provide an alternate means of escape during an emergency. Where skylights or clerestory glass is provided over atrium or high spaces, provide OSHA safety cages or approved alternate protection to prevent maintenance personnel from falling through the glazing. Where roof mounted equipment requiring maintenance or inspection access, provide footpath walkways to minimize damage to the primary roof membrane. Where absolutely necessary to have pipes, conduits, and the like. across a roof, specify "zero penetration" portable suspended pipe hangers with non-rusting base supports to distribute weight without damage to the membrane. Provide details for all penetrations, joints, abutments, and changes in materials or elevations. Details shall be drawn large enough to clearly indicate the location of each layer of material, attachment and overlap necessary to provide a proper seal, lap or flashing. The use of bold lines to indicate ambiguous

details without clearly showing the installation requirements shall be prohibited. Refer to § 2-400 for additional information.

(12) Provide a Life Safety plan for each building. Show the location of all required fire exits. Show the locations of all other exits meeting the requirements of a designated fire exit. Show the locations of all rated partitions and the rating requirements. Provide details of typical rated wall construction keyed to the floor plans. Provide details for recommended penetrations and openings in rated partitions. Show the location of the fireman service command center if applicable.

(13) Provide all information related to the Americans with Disabilities Act (ADA) accommodations and access. Show where the ADA parking accommodations will be provided and clearly design the routes of access and exit to the building. Show the location of ADA facilities including ADA toilets, drinking fountains, vertical transport, sleeping rooms, bathing facilities and the like on the plans. Reference other architectural drawings as necessary to locate the construction details and dimensioning. Provide details of all ADA required special features such as handrails, door controllers, ramps, curb cuts and the like. Provide a riser type detail showing the ADA mounting heights of counter tops, work surfaces, thermostats, light switches, fire alarm devices, door handles, toilet fixtures and other features included in the work to provide for a central point of information regarding the heights of these elements. Do not merely refer to ADA requirements or guidelines.

(14) Where modular furniture or movable furniture will be a part of the contract, provide plans showing the specific locations for each component by component name or model number. Provide legends and schedules as necessary to adequately describe the components in the plan view. Provide elevation views of modular workstations and furniture to allow verification of functionality and to describe the scope of the work. Furniture not provided as a part of the contract shall be clearly labeled as "Not in Contract" (NIC) or as Owner furnished/Contractor installed.

(15) When seismic restraint of non-structural elements is required by code, provide details of typical acceptable restraining methods. Show locations of all restraints on the plans and cross reference the appropriate details. Provide the basic design criteria for the restraining system including the seismic zone/category in which the project is located.

(I) Kitchen Equipment Drawings

(1) Floor plan drawings shall be shown at a scale no less than $1/8" = 1' - 0"$. Food preparation areas and food service area plans shall be drawn at a minimum scale of $1/4" = 1' - 0"$. Plans should show the relationships for all fixed and movable furniture, equipment and appliances. Provide area names to define the various function areas in the food service drawings (i.e. preparation, cooking, baking, serving, and the like.)

(2) Provide an equipment schedule that identifies each piece of equipment's function, power and utility requirements, motor sizes and voltage requirements where applicable and a reference product manufacture and model number. Where equipment, fixtures or furniture must be custom fabricated for this specific project, note in the schedule that the item is "custom built".

(3) Provide details and elevations as required to describe the fabrication and installation requirements for all fixtures and furniture. Where components must be custom built, provide the

fabrication details necessary for the contractor to select the proper materials, methods dimensions and finishes required to construct the project.

(4) Where connections are required by other trades, do not refer to "connection by plumbing sub-contractor or the like." (Refer to § 2-903 (P)). ABA considers equipment of fixtures which are permanently attached to the building structure by anchor bolts or fasteners or which require hardwired or permanent connection to the building mechanical or electrical systems to be "capital improvements and as such shall be subject to compliance with all Arkansas laws and regulations including but not limited to Ark. Code Ann. § 22-9-101 et seq. (Public Works Codes), Ark. Code Ann. § 17-15-101 et seq. (Licensing for Engineers), Ark. Code Ann. § 17-30-101 et seq. (Licensing for Architects). Furniture or equipment, which is completely portable or movable and only requires a plug-in connection or a quick copper connection are considered as furniture and not as a capital improvement.

(J) Structural Drawings

(1) On the first sheet of the structural drawings, provide the information pursuant to Ark. Code Ann. §12-80-101 et seq. and the Arkansas Fire Prevention Code regarding seismic design. Provide a brief description of the type of foundation and framing system used. Reference the sub-surface soil investigation and survey (company and date). In no investigation has been performed, indicate all assumptions used for the foundation design. Describe the live load allowances included in the system design. Note the allowances used for partition loads, mechanical and electrical system loads and the allowance for movable items such as furniture and the like.

(2) Foundation drawings shall include a notation for the design bearing values for all spread footings and caissons and bearing loads for all pilings. Show details for all slab and footing interfaces including those for interior partitions. Show the locations and spacing for all construction, expansion and control joints on all concrete expanses. Show locations of perimeter insulation systems, under-slab drainage and foundation drain system. Where expansive clay soils or other unsuitable soils are indicated, show the requirements for the proper backfill of a suitable material or engineered system to provide the proper bearing support. When collapsible forms are required to compensate for subsurface expansion, show the detail requirements for installation and control.

(3) For all plans, show the minimum concrete strength required for each part of the structure as required to comply with the Arkansas Fire Prevention Code. For special areas such as mezzanines, show the maximum safe live load that the Owner may place on the mezzanine after construction. Show the steel yield point strength for all reinforcing and structural steel.

(4) Framing plans shall show the size of each element and the dimensional location. When the framing system includes areas such as shear walls, which should not contain penetrations, these areas shall be clearly noted and shaded or hatched to allow rapid location and identification during the review process. On systems such as post tension slabs where penetrations must be exactly located, show all locations by dimension and provide a cautionary note for the contractor advising him of the restrictions or precautions necessary to follow during construction regarding the cutting of additional openings.

(5) For pre-engineered systems such as pre-engineered metal building, tilt-up slab construction, pre-tension slabs, post-tension slabs, or modular prefabricated construction, provide sufficient

information and details as required for the fabrication to meet the requirements of the project. Include all design values necessary to fabricate the structures and to allow independent verification that the furnished product meets the design intent. Include plan views and elevations of these pre-engineered systems to allow review of the concept and coordination of work designed by other trades such as mechanical, electrical and architectural finishes.

(6) Provide schedules showing all grade beams, pilings, caissons and other elements where size, type, strength and special connections must be coordinated to ensure proper construction. Include other schedules as required to allow accurate bidding, construction, and field verification or as required to communicate the design intent. This can include, but are not limited to, column schedules, beam schedules, truss schedules and the like.

(7) Show all typical and special connection details. Indicate the location and type to allow quick coordination and review.

(8) Show section views and elevations as required to indicate the connection locations of beams, floors, joints, trusses, and the like. Where sections do not show the floor below, provide a dimension reference to the top of the beam, bearing elevation of the joist or other element that will allow accurate determination of the clear space below the bottom of the structural elements. This dimension should be in reference to the finished floor below or in elevation dimensions (i.e. 10'-0" above 2nd floor or elev. 112'-6").

(K) Mechanical Drawings

(1) Show the locations of all heating, ventilating, and air conditioning equipment on the plan view. Provide each piece of equipment with a unique designation mark keyed to the equipment schedule. Equipment shall be located as required to provide proper access for maintenance and repair. Equipment shall also be located as required to facilitate future removal and replacement without requiring the demolition of walls, windows, or other perimeter features of the building. Where replacement will require removal of louvers, other equipment, piping or ductwork, clearly indicate the separation points on the plans. Use bolted flanges or other replaceable type connections. Where replacement or installation will require removal of a wall, door, window or the roof, the design professional must obtain written approval from the Section prior to the submission of the final review documents (construction documents).

(2) Show the routing of all ductwork and piping on the plan views. Ductwork shall be shown double line all the way to the diffuser or grille. Differentiate between high velocity ductwork, double wall ductwork, single wall ductwork and internally insulated ductwork with a distinctive shading or hatching pattern. Differentiate between different duct system materials such as PVC, aluminum, galvanized and the like in a similar manner. Piping 6 inches and larger shall be shown double line on plan and section views at 1/4" = 1'-0" scale or larger. Piping 10 inches and larger shall be shown double lined on plans and section views at 1/8" = 1'-0" and larger. All other piping shall be single line and bold. Show reducers, increaser and when fittings on all ductwork and piping at each change in size. Provide arrows on the piping plans indicating the direction of flow and direction of slope of the lines.

(3) Where the HVACR system contains refrigeration equipment with remote condensers, condensing units or fluid coolers, show the routing of the refrigerant piping between each piece of equipment on the plan and section views. On small systems such as package coolers or split system air conditioners, the designer may use a single line to represent both the suction and

liquid lines. Provide dual designation on the line (i.e. RS/RL) and provide the size of both lines in the dimension note. Where hot gas by-pass, double suction risers or similar special lines are required, show these lines separate from the combined suction and liquid lines. Provide refrigerant piping schematics for each unique system. Show all the refrigerant specialty items and isolation valves. The designer may show the pipe sizes in a schedule format for each unit adjacent to the piping schematic.

(4) Show the airflow quantity at each air device with a balancing damper to facilitate capacity verification and final air balance. For special areas such as laboratories, isolation rooms, special procedure rooms, and hazardous storage or sterile storage rooms, show the pressure relationship for that space relative to the adjacent spaces such as positive pressure, negative pressure, or neutral pressure. This is not required for toilet rooms, janitor closets, or similar spaces, which are clearly negative to the adjacent spaces. The designer may indicate the pressure relationship for these spaces if necessary to clearly communicate specific design intent. The sum of the air flow quantities in a zone shall match the capacity of the air handling unit or terminal devices in the respective zone plus or minus an appropriate amount as required to maintain the space pressure relationship.

(5) Show the exact location for each fire damper, smoke damper, control damper, balancing damper, control sensor device and the access door to each device on the plans and section views. In variable volume systems, show the locations for all relief doors upstream or downstream of every fast closing damper as required to prevent the collapse or rupture of the duct system.

(6) Where ductwork penetrates a floor or a roof and where a duct rises up or down, show the cross section of the duct with the appropriate diagonal marking and shade a portion of the cross sectional view to prominently show the location of the penetration or riser on the plan view. Provide a note indicating the size and direction of the riser and to where it goes (i. e. 10/10 up to 2nd floor).

(7) Where hydraulic or steam piping systems are provided, show the location of all expansion joints or loop and the locations of all anchors and guides required to control the expansion. In steam systems, show the locations of all traps and vents required for the proper startup and maintenance of the equipment. Show these locations on the plan views. Include the locations of access doors where required. When designed offsets in these systems create traps or air pockets, show a drain and vent location to facilitate future drain and fill of the system.

(8) When hydraulic systems require freeze protection additives such as a glycol or brine solution, show the estimated system volume on the drawings along with the percentage by weight or by volume of the anti-freeze additive and the type of additive required. This may be noted on the system flow diagram. Ensure that all equipment capacities have been adjusted to account for the additive.

(9) Provide an enlarged plan view of each unique mechanical room at 1/4" = 1'-0" minimum. Show the location of all HVACR equipment, piping, ductwork, controls panels and the locations of all electrical panels, plumbing equipment and other equipment within the room. All non-HVACR equipment should be shown dashed and a reference provided to the appropriate sheet where that equipment can be found. Coordinate the location of these items to ensure proper code clearance, maintenance access, and operational access.

(10) Provide at least one cross section view of each mechanical room showing the elevation of the equipment, ductwork and piping in the room to allow the contractor sufficient information for bidding and to allow verification of proper access for service and replacement of equipment. Large or complex rooms may require multiple section views to clarify these issues. All section views should be drawn to a minimum scale of $1/4" = 1'-0"$.

(11) Provide at least two cross sectional views through the building along each of the major axis showing the mechanical systems. The minimum scale for these views shall be $1/8" = 1'-0"$. Provide additional enlarged scale sectional views as required at crossovers of ductwork and piping, furr-downs, and offsets under major structural members to clearly describe the installation limitation at these areas. Reference all known or possible interference from other trades such as sprinkler piping, electrical conduits, plumbing drains, and the like. Where these large-scale sections do not show the floor to floor view, provide a dimension to the finished ceiling and bottom of the structure to allow verification of the clearance (i.e. $10'-0"$ ceiling and $11'-6"$ bottom of joist, and the like).

(12) Provide details of typical connections, mounting details, piping specialties and unique installations. Details may be drawn "not to scale" provided the detail is not required to clarify a clearance or service access issue. In these cases, show the detail at an appropriate scale. Cross-reference the sheet number to where the specific detail applies. Also provide a detail flag on each plan sheet, which references the appropriate detail number on the detail sheet. Provide an individual detail number on each detail to facilitate this cross-referencing. Provide as many details and detail sheets as necessary to clearly communicate the installation requirements for the project.

(13) Provide flow schematic for chilled water, heating water, condenser water, steam systems, and other heat transfer systems. Show the relationship of the equipment in the process. Show all piping connections control elements and valves necessary for the proper operation and maintenance of the systems. Size all piping, vents, drains and valves. Show capacity, flow and pressure loss for generating equipment. The diagram should be drawn to enhance rapid understanding of the system. For complex systems, provide diagrams in a ladder type arrangement to eliminate line crossings and the need for isometric views to clarify flow path. Correctly show the flow path and the relative location of all components, junctions and branches. Do not change the relative location of flow junctions to avoid line crossings. Provide arrows indicating direction of flow on each pipe segment. Show all make-up valves, relief valves, pressure reducing valves, and expansion tanks. Show the pressure rating and capacity of each on the diagram. For complex systems with numerous valves, fitting, and components provide multiple versions of the basic diagram with control capacities, or sub-system elements super-imposed on the diagram

(14) Provide control diagrams for each unique system or unit. Diagrams shall show the locations of all sensors and control elements. Provide a designation for each component and a legend or schedule for symbols on the same sheet (i.e. mixed air sensor and the like). Show the set point and alarm points on the diagrams or in the schedules. Indicate the type of control point for each device (i.e. Analog Input AI). Include the sequence of operation on the sheet with the control diagram. Ensure that the sequence is clearly spelled out as to the actions and reactions of the components to the command or control signal. When pipe mounted or duct mounted sensors are installed, provide a spare well adjacent to the control device to allow field verification of the device operation or the media temperature or pressure with portable, hand

held instruments. Provide a schematic diagram for each network LAN showing the location of each panel and workstation connection and the equipment it serves.

(15) Provide equipment schedules on the drawings. Do not schedule equipment in the specification's manual. Schedules shall be arranged in graphic format with the major operating conditions defined and the capacities shown. Include the electrical requirements showing the power voltage, phase, amperage, motor horsepower's and brake horsepower. For major equipment such as chillers and boilers, include the energy efficiency rating. Provide sufficient data to allow purchase, startup and balancing of the system or equipment. Include data necessary to trouble shoot equipment in the event of a startup or operational problem. Schedules shall be provided for each type of equipment or component (i.e. air handler, air devices, pumps, traps, and the like). Provide a unique designator for each piece or type of equipment. Ensure that the schedule title and designator are consistent with the plan labels. In the header for each schedule, show the specification section number where that item can be found (i.e. Air Handlers – 15850).

(16) Where seismic restraints are required by code, provide details of typical acceptable restraining methods for piping, ductwork, and equipment. Show locations of all restraints on the plans and cross reference the appropriate details. Provide the basic design criteria for the restraining system including the seismic zone in which the project is located. Where the code allows exemptions or exceptions based on pipe size or location of piping or ductwork relative to the supporting structure, note the exceptions on the plan. Designers are encouraged to lay out system piping and equipment in a manner which eliminates where possible the need for costly restraints and minimizes the hazard to the building occupants during a seismic event.

(L) Fire Protection Drawings:

(1) Show location and types of sprinkler heads. Provide a different symbol for each type of head.

(2) Show the hazard classification for each area with a different classification.

(3) Show the locations and ratings of all fire and smoke partitions. Show all fire doors, smoke vents or fire shutters.

(4) Show the location of the fire service entrance. Show a detail of the service entrance including all valves and devices in the entry riser. Include the locations of the test drains, alarm devices, seismic connections and backflow preventers.

(5) Where a fire pump is required, show a minimum of 1/4" = 1'-0" scale plan review of the pump room and a minimum of one (1) cross-section view of the room showing the elevation of the piping and valves.

(6) When standpipe risers are required, show the location and size of the piping from the service entrance to each riser. Show the location and size of each hose or fire department connection. Indicate the mounting height of each hose cabinet or fire department connection.

(7) When sprinkler heads are installed in electrical rooms, computer rooms, telecommunication rooms elevator shafts or elevator machine rooms, show the temperature ratings for these special heads and indicate if these are pre-action or deluge type systems.

(8) Show the area of coverage by special systems such as dry-pipe systems, pre-action systems, or non-water systems. In non-water systems, show the complete layout of piping, storage tanks, and system controllers.

(9) Show the locations of all control valves and tamper switches in the system. Show other devices that require interconnection with the building fire alarm system or other alarm or monitoring systems.

(10) Show the location of all piping and the preferred routing throughout the building. Size all piping, including branch piping, on the bid documents. The designer may use the pipe size chart provided in NFPA 13 or may perform the hydraulic calculations necessary to size the piping. It is permissible to allow the successful contractor to submit an alternate layout in the shop drawing phase subject to review and approval by the engineer.

(11) Provide the details necessary to show the preferred or acceptable mounting requirements and piping support systems. Where systems are subject to seismic design requirements, provide the seismic restraint details necessary to comply with the requirements of the zone in which the system is installed. Show locations of all restraints on the plans and cross reference the appropriate details.

(M) Plumbing Drawings

(1) Show the locations of all plumbing fixtures, equipment, drains, vents, outlets and valves necessary for isolation, operation or emergency service on the floor plans. Enlarged plans may be used to show exact locations.

(2) Clearly define which piping is located below the floor, above the ceiling or exposed in the occupied spaces. Piping subject to freezing shall be installed on the warm side of the building insulation or provide with heat trace system.

(3) Size piping on the plan views. Show increasers and reducers at the point where sizes change. Show sizes of piping risers, or headers concealed inside chases or where they pass through a floor.

(4) Crosshatch or shade all plumbing fixtures and equipment for ease of location. Provide a unique designation for each type of fixture or equipment.

(5) Provide waste and vent risers in accordance with the requirements of the Arkansas State Plumbing Code. Size the piping on the floor plans and these diagrams. Show the size of each vent through the roof and designate these penetrations on the risers and plan views with their size. (i.e. 4" VTR).

(6) Show the locations of all roof drains and area drains on the plan views. Show where all drains terminate or discharge. Where emergency overflow drains or scuppers are to be used, show locations and sizes. Provide correct locations and details on the plumbing drawings and cross-reference the appropriate locations and details on the correct architectural sheets.

(7) Show the locations of all cleanout plugs and manholes as required by the Arkansas State Plumbing Code. On open drain inlets, outlets, and all connections to manholes and catch

basins, show the elevation of the top of the feature as well as the flow line inverts of all inlets and outlets.

(8) Provide a schedule showing the sizes, capacities, operating characteristics, and design basis product name for all plumbing equipment (i. e., water heaters, pumps, compressors, and the like). Plumbing fixtures may be scheduled in the specifications however; the preferred location is on the drawings.

(9) For special piping systems such as natural gas, medical gas, laboratory gas, process piping and the like, provide the same information as generally described above. For small projects, multiple systems may be shown on the same plan view. For large or complex projects such as laboratories and hospitals, provide separate plans for clarity. For systems such as reverse osmosis, de-ionized water or ultra-pure water systems, show all components in their respective locations on a flow schematic. Ensure that complete specifications are provided for each component in the system. Do not rely on the Contractor or the Vendor to size the system and select the components.

(10) Provide details for fixtures and equipment connections showing all valves, accessories, mounting supports, hangers and auxiliary connections to other systems as necessary to communicate the installation requirements, operation requirements and the maintenance shutoff or removal points. Provide control interlock diagrams for equipment with automatic controls. For systems containing tanks or holding vats, show all header piping requirements, tank, cylinder or vat sizes in gallons or cubic feet and methods for securing the tanks in place. If alarms are required for notification of over temperature, over pressurization, overflow or low volume, note these set points on the details or control interlock diagrams.

(11) Where seismic restraints are required by code, provide details of typical acceptable restraint methods for piping and equipment. Show locations of all restraints on the plans and cross reference the appropriate details. Provide the basic design criteria for the restraint system including the seismic zone in which the project is located. Where the code allows exemptions or exceptions based on pipe size or location of piping relative to the supporting structure, note the exceptions on the plan. Designers are encouraged to lay out system piping and equipment in a manner which eliminates where possible the need for costly restraints and minimizes the hazard to the building occupants during a seismic event.

(N) Electrical Drawings:

(1) Show the source and voltage characteristics of all power sources. Show the exact location for connections to existing power, telephone, fiber optics, security and other services to the project. Where such connection points are shown on other drawings such as civil drawings, reference the sheet number where these connection points can be found. Coordinate these cross-references to ensure the proper connection and entry points are shown. Indicate the ownership of the existing utility to which these connections are to be made. Some State facilities own their own distribution networks and many do not. Provide a phone number and a contact name for the owning agent to coordinate connection requirements. Provide a detail of each utility entry into the building.

(2) Lighting layout shall indicate the switching and circuiting of each fixture or group of fixtures. Circuiting shall indicate the power source panel and the circuit breaker number for that circuit. Emergency egress lighting shall be crosshatched or shaded so the fixtures will stand out for

rapid identification during review of the drawings. When emergency power is provided by a generator, or other backup source, the circuiting lines connecting fixtures and outlets should be designated with an "E" to identify these circuits as emergency power. Each fixture symbol shall contain an identification designator that is keyed to the fixture schedule.

(3) Power outlets shall be circuiting in the same manner as lighting circuits. Indicate the mounting heights of outlets to ensure proper installation. Where outlets must be installed in a specific pattern or spacing, provide dimensional plans and elevations. In the absence of the specific dimensional location of outlets, the contractor will install the box on the nearest stud or blocking. Where power is provided to equipment, show the exact location of the disconnect switch. Indicate the starter location and note if the starter is to be furnished unit mounted with the equipment. Show the size of the power conductors and the conduit serving the equipment.

(4) Show the location of all system components such as fire alarm, security, closed circuit television, sound, paging, telephone, computer and the like. When the systems to be furnished are complex or may be installed by a specialty contractor, provide separate drawings for these systems. Ensure that all components and locations are coordinated with other trades in the design phase. Where systems are simple or small in nature, they may be combined with other system drawings such as the lighting or power. When the interconnecting cabling for these systems may pose an interference with other trades, show the preferred or engineered routing of the cabling and conduit. As a minimum, provide riser diagrams or schematics for each system. Show the location of all system head end or front-end panels, control stations and sub panels. When a system must interlock or interface with another system such as the fire alarm and fire sprinkler system, show the exact location of such interfaces and the specific interlock requirements.

(5) Perform the lightning hazard calculations as defined in NFPA-780 and include this information on the cover sheet or in the electrical general notes. If a lightning protection system is to be provided, show the locations of all air terminals, interconnecting grounding cables, down leaders and ground termination points. Where grounding is connected to other grounding systems, show the connection point and the location of the other grounded systems termination points. Show all details necessary to describe the attachment of air terminals, cabling support, penetrations of the building envelope and attachment to the grounding rods or other systems. Indicate the location of all test points necessary to measure the system resistance and specify the maximum permissible resistance allowed by the system design.

(6) Show the location of main electrical rooms. Provide enlarged scale drawing as necessary to show and designate all equipment. For rooms containing equipment over 6'-0" tall, provide section views of equipment in the room showing installed elevations and clearance above the equipment. Ensure that all equipment including branch panels and disconnect switches are installed with proper clearances in front of and above the unit as required by the National Electrical Code NEC Article 110. Ensure that all panel locations are coordinated with other equipment in the space. Show the locations of all panels on the small-scale plans also.

(7) All new buildings and additions and renovations of more than 4000 SF of space shall include at least one (1) dedicated telecommunication room per floor sized in accordance with the recommendations in the appropriate EIA/TIA Standards but no less than the size shown in § 2-1402. Show the location of all cable entry, mounting rack, backboards, operator stations, UPS equipment, and power outlets. For mission critical operations, provide emergency lighting in the room. Clearly define on the drawings who will be furnishing the interconnection cabling (i.e.

cable and terminations by the contractor or by the owner). Specify plenum rated cabling in all installations not in conduit regardless of whether or not the ceiling cavity is currently a return air plenum.

(8) Provide a wire management system in all new construction for the installation of special systems wiring which will not be installed in conduit raceways. The wire management system shall be attached to the building structure or walls in a manner so as not to overload the structure. Wire management systems shall be designed to accommodate multiple systems without electronic interference or creating a code violation. Where necessary provide multiple systems for dedicated use by a single system. Wire management system and attachments should be designed to allow a minimum of 25% future growth for each wiring system.

(9) Provide electrical details and system details as required to completely describe the installation requirements and interconnection with other systems installed by other trades. Particular attention should be paid to the installation of exterior lighting fixtures, special interior fixtures such as chandeliers, operating room lights, and the like. Details of special grounding requirements should also be included.

(10) Provide riser diagrams or schematics showing the relationship of major components such as panel boards, transformers and service entrances. Risers shall also be provided for special systems such as fire alarm and security systems. For large or technically complex projects, provide one-line diagrams showing the source of power, or service and the size and relationship of subcomponents such as distribution panels, breakers, fuses, switches and routers to each major sub-panel or element. These diagrams shall also include the size of the wiring and conduit between elements and the ratings of the breakers, fuses, switches and routers with enough information being provided to describe the limits of the capacity of the system and components.

(11) Provide schedules for all lighting fixtures, transformers, panel boards and specialty systems components. Schedules shall include the voltage rating for each item, the capacity of the item and any power losses or inefficiency of the fixture or equipment. Equipment producing a heat loss (greater than $\frac{1}{2}$ of 1 percent of the equipment rating) shall include the manufacturers heat loss in Btu's on the schedule. Equipment producing radio frequency interference (RFI) or electromagnetic interference (EMI) greater than that allowed by FCC regulation shall be noted on the schedule and any special shielding requirements necessary to control or eliminate this interference should be noted and detailed or specified. Schedules shall be provided for each type of equipment or component (i.e. fixtures, transformers, generators, the like.) Provide a unique designator for each piece or type of equipment or fixture. Ensure that the schedule title and designator are consistent with the plan labels. In the header for each schedule, show the specification section number where that item can be found (i.e. Transformers-16460). Panel board schedules shall be presented in a graphic format and shall include a designator for what each circuit feeds to facilitate the development of the panel board directory. Do not limit the panel board schedule to a description of the quantity of certain size breakers such as circuits 1,2,3,4 = 20A or "provide 20-20A/1P breakers.

(12) Where seismic restraints are required by code, provide details of typical acceptable restraint methods for piping and equipment. Provide the basic design criteria for the restraint system including the seismic zone in which the project is located. Were the code allow exemptions or exceptions based on pipe size or location of piping relative to the supporting structure, note the exceptions on the plan. Designers are encouraged to lay out system piping

and equipment in a manner which minimize the need for costly restraints and eliminates where possible the hazard to the building occupants during a seismic event.

2-1600 APPROVAL TO BID OR PROCEED [INTENTIONALLY LEFT BLANK]

2-1601 AGENCY APPROVAL

(A) Upon Agency approval of the completed construction documents (previously submitted including responses to the Section comments), the Agency Project Coordinator shall inform the Section and the Design Professional in writing that the Agency accepts and approves the drawings as submitted. There shall be no changes from the date of the letter unless submitted and approved by procedures initiated by ABA.

(B) The approval to bid or approval to proceed letter is valid for 1-year from the date of the letter. If the project has not bid within that 1-year period, the project must be re-submitted to the Section for review and approval.

2-1602 BID DATE REQUESTS, OR REQUEST TO PROCEED WITH CONSTRUCTION

(A) Bid date requests to the Construction Section may not be made until approval from the Section has been given. If the Design Professional is responsible for coordinating the bid date, written approval must be secured from the Agency prior to bidding. The Construction Section must be contacted to coordinate a bid date, time, and location. Upon coordination with the Construction Section, the project may be advertised and bid documents released to bidders. (Refer to § 3-200 & 3-303)

(B) For projects subject to ABA bidding and contract management, a separate submittal of the "front end documents" may be required to the Construction Section prior to the establishment of a bid date.

(C) An Agency may not enter into a contract for a negotiated capital improvement project unless allowed by law and prior approval of plans and specifications has been provided by the Section.

2-1603 CONTRACT DOCUMENTS TO BE PROVIDED TO THE GENERAL CONTRACTOR

(A) The Owner and Design Professional shall provide the successful general contractor with the minimum necessary copies of the contract documents as outlined below, however, this section shall not preclude lesser amounts, if agreed upon by the Owner and Contractor.

PROJECT SIZE (COST)	NO. OF SETS TO ISSUE
\$0 - \$500,000	10 sets
\$500,001 - \$1,000,000	15 sets
\$1,000,001 - up	20 sets

(B) The project general contractor shall be responsible for the cost and distribution of additional bid documents to his respective sub-contractors. Partial sets of the contract documents shall not be allowed. All trades shall have complete contract documents for reference.

2-1604 RECORD COPIES OF PROJECT DOCUMENTS

(A) At the final completion of the project, the Design Professional shall submit one (1) copy of the complete set of the project documents on a CD Rom. See §3-500(D).

(B) In addition, if any of the drawings or specifications were prepared by computer assisted drafting (CAD) or word processing, the Design Professional shall also provide one copy of all computer generated "read only" documents to ABA and one copy of the "read only" documents to the Agency) for record purposes.

(C) Acceptable formats for word processing, spreadsheets database, presentation graphics and other similar documents are Microsoft Office Products or other formats converted and saved as such. Cost of the microfilm and electronic media are reimbursable from the Agency.

(D) When drawings or specifications are not produced electronically, the Design Professional shall have the documents scanned in to a photo image such as a TIFF image, PDF file, or an AutoCAD file for record purposes. These files shall be furnished on compact disk. The files shall be capable of being opened by an industry standard file manager such as Adobe Acrobat Reader, Kodak Image reader or similar software. Verify the Agency preference prior to submitting these types of files.

(E) Agencies requiring electronic media copies should carefully consider environmental storage requirements. It is recommended that electronic information be transmitted on compact disc and backed-up with a tape drive where possible.

(F) If an Agency utilizes portions of existing reproducibles or electronic media for bidding purposes, i.e., carpet replacement, ABA requires all title blocks (of the original design professional) be removed and new title block information provided before project is released to any bidders.

(G) Design professionals providing electronic media, tracings, reproducible, "as-built" record drawings, the like, may request that release agreements limiting their use be signed prior to releasing to the Agency or ABA. These release agreements shall be carefully reviewed by legal representation of the Agency and submitted to ABA for review before signing. Improper use of a Design Professional's work may result in claims for additional compensation.

(H) If the Design Professional is required to deliver any services required hereunder in the form of electronic encoded media, the printed representation of such media furnished by the Design Professional shall be the official record of the Design Professional's service. Agency shall have a right to rely on such printed representation in connection with any subsequent modification of such electronic media. The Agency and ABA recognize that the printed material represents the intent and instructions of the Design Professional but does not represent the "as-built" condition of the project. The Agency must obtain written authorization from the design professional allowing the use of the documents for any purpose other than the specific intended use of those documents.

2-1605 DESIGN PROFESSIONAL PROJECT OBSERVATION REQUIREMENTS

(A) The Design Professional and his consultants shall conduct construction observation visits to the construction site as part of the basic professional services. (Refer to § 2-201.) The design

professional shall conduct visits to determine the progress and performance for all capital improvement contracts. On-site observations shall concur with the contractor's pay request and shall be submitted in written form with the pay request.

(B) Construction observation of the project by the prime Design Professional and all consultants at key critical times during construction for that applicable portion of the work for which they are involved, shall be as required to observe fulfillment of the construction documents.

(C) Both the Design Professional and all consultants shall submit a typed construction observation report or summary of any observed construction deficiencies, with follow-up correspondence to the Agency's Project Coordinator on ABA approved forms. Copies of the Design Professional's and all consultant's construction observation reports and follow-up correspondence shall also be forwarded to the Construction Section and shall accompany the Contractor's monthly payment request.

(D) The Agency Project Coordinator and the Design Professional shall carefully evaluate the need for more intense project observation than the basic services provides. This may include projects requiring the installation of underground utilities, the construction of critical concrete structures and similar projects where the normal course of construction may render critical elements of the project unavailable for inspection due to the placement of finish materials

(E) On projects where this may result in the inability of the Agency to accept the project with confidence that the work has been properly installed, the Agency may desire to require more intense observation by the Design Professional than would normally be provided by the basic services agreement. The Agency shall negotiate the rates for additional observation during the original contract negotiations. If it becomes necessary to expand the design professional's scope of services by amendment, consult with ABA prior to negotiating the amendment.

(F) For instructions regarding construction observation and administration, and project closeout requirements please refer to §3-500 through §3-600.

2-1700 CAPITAL IMPROVEMENT ALTERNATIVE DELIVERY METHODS

Pursuant to Ark. Code Ann. §19-4-1415, unless exempted, ABA has authority to oversee contracts in the amount of \$5,000,000 or more, which are not awarded in the traditional design-bid-build method, but rather awarded through negotiations.

2-1701 PROJECT CRITERIA

Refer to § 3-701.

2-1702 SELECTION OF DESIGN PROFESSIONALS

(A) The procedures prescribed in § 2-100 shall apply to the selection of Design Professionals utilized for projects under this section.

(B) Refer to § 2-102 (A) and add the following requirement:

(1) The Agency shall indicate that the contemplated project exceeds \$5,000,000 in estimated construction cost, excluding land costs, and that the Agency intends to utilize a type of negotiated contracting for the construction phase.

(2) Refer to § 2-102(C). The draft advertisement shall clearly indicate that the design services required would be utilized on a project that the Agency intends to award through negotiations in lieu of the traditional design-bid-build process. The notice shall also indicate that the selected professional will work with the Agency's contractor in the development of the project budget, construction options and administrative procedures for managing the project under "fast track" conditions if applicable.

2-1703 SELECTION METHOD FOR DESIGN PROFESSIONALS

(A) Selection of Design Professionals shall be as prescribed in § 2-106 except that the pre-selection committee shall consist of five (5) members, three (3) from the Agency and two (2) from ABA. The ABA Director shall determine the members from ABA and the respective Agency Director shall determine the members from the Agency.

(B) Refer to § 3-700 et. seq. for the selection of construction managers and contractors.

2-1704 BASIC SERVICES DEFINED

(A) Refer to § 2-201 for Basic Services Defined. All services listed shall apply except as follows:

(1) For "fast track" projects, the schematic design and the design development phases shall be condensed as required to verify the budget estimate via contractor pricing.

(2) Construction documents may be developed in phases as necessary to maintain the project delivery schedule.

(3) For "fast track" projects, the Design Professional shall obtain all "as-built" information from the contractor and shall compile this information into an accurate set of record drawings and specifications for submittal to the Agency in printed form and in electronic form.

(B) A copy of these record drawings shall be provided to ABA in electronic form only.

2-1705 PROJECT SCHEDULE

(A) Refer to § 2-318 (C) for basic schedule requirements.

(B) For projects utilizing a "fast track" methodology, the Design Professional shall assist the Agency in developing a "Request for Proposals" package to be utilized in the selection process for the contractor or construction manager. The RFP shall be submitted to the Section and Construction Section for review and approval prior to issuing to potential contractors. The requirements of the RFP shall closely match the requirements of a schematic design plan review submittal. Include appropriate specifications for the desired building materials and equipment.

(C) The Agency shall submit a schedule of activities listing the proposed milestone submittal dates to ABA including but not limited to the following:

- (1) Submittal of request to begin selection of the design professional.
- (2) Submittal of request to select commissioning agent (if applicable).
- (3) Submittal of contractor selection RFQ document for review and approval.
- (4) Submittal of design professional services contract for approval.
- (5) Submittal of commissioning agent services contract (if applicable).
- (6) Submittal of contractor contract.
- (7) Submittal of first plan review.
- (8) Beginning date of construction phase and expected duration of construction.

Refer to § 2-1706(E) for submittal schedule requirements using “fast track” construction.

2-1706 PLAN REVIEW REQUIREMENTS

(A) All plans shall be submitted to ABA for review and approval prior to delivery to the contractor or construction manager for pricing. Refer to §2-1500 et. seq. for basic plan review submittal requirements.

(B) Projects not utilizing the “fast track” method shall be submitted to Design Review when the plans and specification are considered 100% complete and ready for bidding or construction. The design professional shall make schematic design and design development submittals to the Agency as required to obtain approval by the Agency to proceed to final construction documents. The documents will be provided to pre-selected contractors for preparation of proposals to construct the facility.

(C) For projects utilizing a “fast track” methodology, the first review submittal shall consist of the documentation normally contained in a schematic design submittal. This first submittal shall contain sufficient information to adequately describe the scope and materials of the total project design. If the contract with the contractor has been implemented, a copy of that contract shall also accompany the submittal.

(D) For “fast track” projects, intermediate submittals shall be made at frequencies necessary to maintain the project schedule and appropriate quality control. This process may result in multiple partial submittals. Each partial submittal shall represent one or more discrete portions of the work, which can be designed, priced and constructed independently of other portions without resulting in de-construction or rework of the portions previously constructed. These individual packages shall be submitted when the plans and specifications for that element of the work is 100% complete.

(E) The Agency Project Coordinator shall submit a schedule of the desired submittal review packages with the first review submittal. The schedule shall indicate the type of submittal package (i.e. Site Work), the estimated cost of that element of construction, the estimated date of submittal and the date the contractor will require approved plans in order to maintain the desired construction schedule. Each submittal package will be labeled with the appropriate title and a volume number beginning with the first submittal which shall be labeled “Comprehensive Schematic Design-Volume 1. The Agency shall follow the schedule submitted and approved by ABA and shall update the full schedule timelines and cost estimates at each subsequent submittal. Deviations from the schedule require ABA approval.

(F) The contractor shall not begin work on a given element of the project until that package of documents has been approved to proceed by the Section. The plans and specifications issued to the contractor for construction shall be stamped "Approved for Construction."

(G) At some point in the process of developing the plans and specifications, the contractor must establish a guaranteed maximum price for the construction contract. When that point has been reached, the Design Professional shall issue a complete set of the documents used to generate that guaranteed price and label the cover as the "GMP Set" along with the issue date. Copies of this set of documents shall be forwarded to the Agency Project Coordinator, the Contractor, the Section and the Construction Section for record keeping. These documents will be the basis of reference for all future adjustments in the cost of the contract. It shall be noted that while changes in the documents may not constitute a change in the GMP, all changes must be documented by change order even if there is no increase or decrease in the contract sum. Approved plans and specifications must accompany all change orders submitted to the Construction Section. In addition, a copy of the Sections' approval to proceed letter shall be included with the change order documentation.