

DESIGN MANUAL
PUBLIC BUILDINGS

**Baltimore County
Department of Public Works Design Manual**

Public Buildings

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**Baltimore County Department of Public Works
Design Manual
Public Buildings Design Standards**

I. GENERAL

These building design standards shall be used by the Department of Public Works and its consultants or contractors for the design of new construction of and renovations to Public Buildings for Baltimore County. Public Buildings shall include buildings owned and/or occupied by Baltimore County, including buildings housing the Police Department, Health Department, Department of Aging, Fire Department, Department of Recreation and Parks, the Circuit Courts, Bureau of Corrections, Department of Environmental Protection and Resource Management, Department of Public Works, Libraries, and/or general government. These standards are applicable to Public Buildings projects including associated sitework, if any.

II. DESIGNER REQUIREMENTS

A. Professional Licenses

All drawings, reports, studies, and calculations required to be sealed shall be signed and sealed by a design professional of the appropriate architectural or engineering discipline, who is licensed and in good standing in the State of Maryland.

B. Drafting Standards

1. In conjunction with this Design Manual there are electronic drawing formats that shall be used. There are unique formats for architectural and engineering disciplines. Most building project drawing sets will include several of these drawing formats; i.e. architectural, mechanical, electrical, civil, water, sewer, and storm drain.
2. Provide legends for drafting symbols and line types used for each discipline. Locate legend on each individual sheet or on a leading sheet containing legends and notes for entire set of drawings or for drawings for each discipline.
3. For architectural, mechanical, and electrical drawings, use the line types provided with the electronic drawing formats.
4. For civil, structural, and utility drawings, use standard drafting symbols and line types provided in the appropriate section in this Design Manual and in the corresponding electronic drawing format files.
5. Provide North arrow on all drawing sheets containing plan views.

C. County Borders

1. County borders are included within the above-described electronic drawing formats.
2. In title block, include individual drawing title/description, project title/description, building name, and, if applicable, name of campus/complex in which building is located.

3. In "Sheet Designation" box in title block, provide a sequential alphanumeric sheet number that includes designation for architectural/engineering discipline (e.g, A for architectural, C for civil, etc.).
4. In title block of architectural and engineering drawings, include statement of professional certification required under Maryland law.
5. In title block, include approval blocks for using agencies, as identified by the Public Buildings Design Section.
6. Variations from County Sample Title Sheet are allowed to accommodate additional project information, additional notes, legends, larger sheet index, and other details as accepted by the Public Buildings Design Section.
7. For sketches, use border shown in plate PB-1 in this section. Include sketch title, building name, and project title/description. Include number of County drawing that is modified by sketch and associated contract and job order numbers. In "Reference" block, include contract addendum number (if sketch issued prior to bid) or request for information, architect's supplemental information, proposal request, or change order number (if sketch is issued during construction).
8. All drawings shall include the date in the architect's/engineer's signature block. The revision block shall be utilized after the bid drawings are issued.

III. DESIGN STANDARDS

A. Codes

1. All public buildings shall be designed to the current building, mechanical, plumbing, electrical, energy, and fire protection codes, as adopted by Baltimore County and the State of Maryland, as well as any referenced standards.
2. For new construction, major renovation, or major mechanical or electrical work, systems affecting energy efficiency, including but not limited to mechanical, electrical, and plumbing systems, shall be designed to meet or exceed the requirements of ASHRAE 90.1, Energy Standard for Buildings Except Low-Rise Residential. Version shall be 2004 or later as adopted by code or as referenced by LEED®.
3. For new construction, major renovation, or major mechanical work, ventilation systems shall be designed to meet or exceed the minimum requirements of ASHRAE 62.1, Ventilation for Acceptable Indoor Air Quality. Version shall be 2004 or later as adopted by code or as referenced by LEED®.

B. General Practices

1. Projects shall be designed with respect to quality of design, function of building and site, and economy.
2. Consideration shall be given to the total life cycle cost of the major building components, including equipment and systems. Total life cycle cost shall include initial installation costs and maintenance and energy costs over the useful life of the component.

3. Materials selected should be appropriate for the intended life of the building and the traffic and wear expected for the use of the building.
4. Building location and orientation on site and site design shall take into account climate, topography, existing ecology, roads, utilities, paths, existing buildings and structures, use of building, public and private access to building, and safety of building users.
5. The design for sitework, including utilities, shall be accomplished in accordance with the appropriate section of this design manual.
6. Building and site design shall take into account adequacy of utilities (electricity, gas, water, sewer, etc.) available at the site.
7. During design, select and specify equipment and systems that are protected from or resistant to vandalism and/or tampering.
8. Site and building design should allow access by service and emergency vehicles to building and exterior equipment.
9. Except where playing fields are required to be irrigated, landscaping and lawns are not to have irrigation systems. Plants, trees, and shrubs should be native species and/or drought-tolerant.
10. In the building design, provide appropriate access to concealed equipment and systems.
11. Exterior and interior lighting shall be designed to provide for the safety and security of the building users, to provide appropriate levels of lighting in conjunction with energy efficiency and utilization of daylight, and to reduce light pollution on and off site.
12. Communications systems and equipment shall be designed and specified in accordance with current requirements from the Office of Information Technology (OIT) and Electronic Services and Telecommunications (EST).
13. On renovation projects, the designer shall consider the possibility of the presence of hazardous materials. Where required, the design professional shall have a certified Industrial Hygienist inspect the project site, report their findings concerning the presence of any lead, asbestos, or other hazardous materials, and provide specifications for the appropriate abatement of hazardous materials. Submittal of report to the Baltimore County Department of Environmental Protection and Resource Management (DEPRM) may be required.
14. On projects including commercial kitchens, the designer shall involve a kitchen consultant. The designer shall submit plans and obtain approval from the appropriate licensing agency or agencies.
15. On projects designated to meet LEED® (Leadership in Energy and Environmental Design) certification, the designer shall have on-staff or involve as a sub-consultant a LEED® accredited professional and shall be responsible for all necessary design and documentation to achieve the requested LEED® certification level.

C. Energy Conservation and Efficiency

1. Site design, building orientation, and building design shall be responsive to climate, local winds, and sun and shall use the sun, winds, and natural landforms to decrease energy usage. Systems and equipment used shall be energy conserving.
2. Energy efficiency of equipment and systems shall involve consideration of the total least cost, current and future availability, environmental compatibility, and renewability.
3. High-efficiency lighting shall be used. Where appropriate to the use of the building and individual spaces, occupancy sensors should be considered for use in spaces such as restrooms, storage rooms, and meeting rooms for energy conservation.

D. Accessibility (ADA)

Building and site design shall meet requirements of the Americans with Disabilities Act Accessibility Guidelines and applicable Code of Maryland Regulations (COMAR) on Accessibility. Site and building should be accessible for both the public and county employees.

E. County Practices

The following County common practices shall be followed for Public Buildings projects unless otherwise approved.

1. Telephone Systems. The County will provide telephones and telephone cabinets and equipment for the telephone equipment rooms. The construction contractors shall provide, install, test, and terminate telephone cabling. Telephone cable material and color shall be in accordance with current County Information Technology and Electronic Services standards. Cables shall be labeled at each end with permanent markings. The terminations shall be with approved jacks and wall plates at individual phone outlets and with approved termination blocks in the telephone equipment rooms.
2. Data Systems. The County will provide data cabinets and equipment for the data equipment room. The construction contractors shall provide, install, terminate and test data cabling. Data cable material and color shall be in accordance with current County Information Technology and Electronic Services standards. Cables shall be labeled at each end with permanent markings. The terminations shall be with approved jacks and wall plates at individual data outlets and with approved termination blocks in the data equipment rooms.
3. Roofing warranty. Low slope and metal roofing shall be provided with 20-year factory warranties. Shingles shall not be installed on roofs with less than 4/12 pitch and shall be provided with 25-year factory warranties.
4. Restroom Accessories. Restroom accessories specified shall be as approved by the Bureau of Building and Equipment Services.
5. Plumbing Fixtures. Plumbing fixtures specified shall be as approved by the Bureau of Building and Equipment Services. Where applicable and appropriate, approved water-efficient fixtures and fixtures with water-saving features should be considered.

6. Door Hardware. Door hardware specified shall be as approved by the Bureau of Building and Equipment Services.

F. Construction Contract Requirements

1. The County does not perform soils and materials testing. Construction documents shall specify that construction contractors shall arrange and pay for independent testing firms to perform required soils and materials testing.
2. Training of county personnel is required for all new or revised mechanical and electrical systems and any special systems installed in the project.
3. Where appropriate to the scope of project, contractor shall be directed to strive to recycle and/or salvage non-hazardous construction and demolition debris.
4. Contractor shall be directed to manage indoor air quality during construction, including meeting or exceeding SMACNA IAQ Guidelines for Occupied Buildings under Construction, 1995 version or later. Absorptive materials stored on-site or installed shall be protected from moisture damage. If air handlers are used during construction, all filters are to be replaced immediately prior to occupancy.
5. Unless there are special requirements for the building, all adhesives, sealants, primers, paints, coatings, and carpet systems used inside the building once it is enclosed shall be low-emitting materials in accordance with the requirements of LEED®. Unless there are special requirements for the building, all composite wood and agrifiber products used inside the building shall contain no added urea-formaldehyde resins.
6. Where appropriate for the building, consideration shall be given to specifying materials with recycled content, materials that are extracted, processed, and manufactured within 500 miles of the project site, and wood-based materials and products which are certified in accordance with the Forest Stewardship Council's Principles and Criteria or similar LEED®-approved certification.

G. Special building considerations:

1. Police Facilities:
 - a) Police Facilities normally have access control and CCTV systems fitted as part of the construction contract.
 - b) Police Facilities shall use proprietary door lock cylinders as specified by the County.
 - c) Booking and detention areas within Police Facilities shall be designed with detention grade materials.
2. Fire Stations:
 - a) Fire Stations shall be designed to incorporate the latest generation County Fire Station Control Console and systems.
 - b) Fire Stations shall use proprietary door lock cylinders as specified by the County.

- c) The Apparatus Bay shall be designed with connected vehicle exhaust removal systems as directed by the County.
- d) Fire Stations shall be provided with an exterior fire-call phone box that is accessible to the public.

H. Special Requirements for Projects Utilizing State Funds

1. All new construction will require a sixty-year life cycle cost analysis to determine the proper roofing system.
2. No new or replacement roof will be approved for state funding that does not have at least a twenty-year, no dollar limit warranty, in accordance with the State of Maryland Department of General Services Policy.
3. Roof replacement projects will consider all factors affecting the proposed system, including span dimension, structural condition, foundation design and capacity, and roof top equipment.

IV. DESIGN PHASES

The following describe the requirements for individual design phases of public building construction projects. All projects will not necessarily require all phases. Requirements will be defined during a pre-proposal meeting.

A. Programming/Study Phase

As required, the appropriate design professional may create a programming statement, space study, needs assessment, study of existing spaces/uses, or other evaluation related to public buildings. These studies shall include all requested information, including complete information needed by the county to review the results of the study. The study shall be signed and sealed by the appropriate design professional, as required. The study may include cost estimates, which may incorporate appropriate escalation.

B. Schematic Design Phase

Schematic Design phase shall illustrate the scale and relationship of project components. Drawings shall include, as applicable, a single line plan of the general space layout of the building(s), location and description of surrounding properties and buildings, area map, rough grading study showing existing and proposed grades, parking facilities, preliminary landscaping, and storm water management areas. The appropriate design professional shall prepare the site drawings. A preliminary submission to the County's Department of Environmental Protection and Resource Management (DEPRM), including computations and conceptual drawings, may be required. A submission to the Developers' Review Committee (DRC), a preliminary submission to the Architectural Review Board (ARB), a geotechnical report including soil borings, and a construction cost estimate based on anticipated construction start date may be required.

C. Design Development Phase

Design Development phase will commence following approval of the Schematic Design documents. Design Development shall fix and describe the size and character of the entire project as to materials, structural, mechanical and electrical systems, and such other essentials as may be appropriate. Drawings shall be prepared by the appropriate design professional. Drawings shall include general site development with landscaping, interior layout, exterior colors, plan views, and elevations. Diagrammatic drawings for structural framing and mechanical and electrical designs shall be included. Outline specifications for the project shall be included. Design professional shall coordinate a meeting with the Baltimore County Department of Permits and Development Management, Plans Review Section, to discuss use, occupancy, egress, and code issues. Site plans, showing grading, sediment control, and storm water management, shall be submitted to DEPRM and the Soil Conservation District (SCD). A final submission to the ARB may be required. A construction cost estimate based on anticipated construction start date may be required.

D. Construction Documents Phase

1. Construction Documents phase will commence following approval of the Design Development documents. Construction Documents shall consist of working drawings and specifications setting forth in detail the requirements for the construction of the project, including necessary bidding information. One or more interim submittals may be required.
2. The necessary bidding information shall include one complete set of mylars individually signed and sealed by the appropriate responsible design professional, one copy-ready set of specifications, and an estimate of construction time.
3. The construction documents shall include a title sheet along with a set of architectural, civil, landscaping, structural, mechanical, electrical, and abatement drawings as required. The various drawings shall be carefully coordinated by the design professional so as not to conflict one with the other. Drawings shall be made in accordance with the best professional practice and applicable codes and shall indicate clearly, accurately, and precisely in such detail as may be necessary what is to be furnished and how and where, and the final results to be obtained as to architectural detail, structural strengths, clearances, mechanical and electrical sufficiency, and general adaptability and dimensional accuracy. Mechanical drawings shall include air flow rates for all devices and heating and cooling loads for the building and equipment.
4. Construction Documents phase shall include submission of site plans, showing grading, sediment control, and stormwater management, to DEPRM and SCD and receipt of approval from these review agencies. This phase shall also include submission of necessary plans and forms for building, grading, and stormwater management permits, as needed.
5. A National Pollutant Discharge Elimination System may be required to be submitted by the design professional if the disturbed area is one (1) acre or more. Consultant will provide completed application form to the County project engineer, who will submit form to the Maryland Department of the Environment.
6. One or more construction cost estimates, based on anticipated construction start date, shall be required.

E. Bid Phase

Bid phase will commence following approval of the Construction Documents. The design professional shall assist the County in obtaining bids for the construction of the project, as required. The design professional shall assist the County in filing required documents for the approval of governmental authorities having jurisdiction over the project. The design professional shall assist in clarifying the contract documents to prospective bidders. The design professional shall attend the pre-bid conference, answer any questions, assist in preparation of any addenda, and assist in the preparation of minutes of the pre-bid conference.

F. Construction Administration Phase

1. The construction administration phase will commence with award of the construction contract and will terminate when final payment is made by County to the contractor or when final construction administration phase work is completed, whichever is later.
2. Design professional and County shall consult with one another as the work progresses. The County shall issue all instructions from design professionals and County to the contractor. When authorized in writing to do so, design professional shall act on behalf of County to the extent of such authorization.
3. Design professional shall at all times have access to the work wherever it is in preparation or progress. Design professional shall make periodic visits to the site as required and attend project progress meetings. On the basis of on-site observations, the design professional shall report to the County and endeavor to guard the County against defects and deficiencies in the contractor's work. Design professional shall not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the work. Design professional shall not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the work. Design professional is not responsible for the contractor's failure to carry out the work in accordance with the contract documents. Design professional may assist the County in determining amount owed to the contractor.
4. Design professional shall assist the County in interpreting the requirements of the contract documents, in making decisions on all claims of County or contractor relating to the execution and progress of the work, and on all other matters or questions related thereto. The design professional shall respond to any requests for information (RFIs) submitted by the contractor. Design professional's decision in matters affecting design performance or the aesthetic appearance of the project shall be final if consistent with the intent of the contract documents.
5. Design professional shall have authority to recommend rejection of work which does not conform to the contract documents. Design professional shall have authority to recommend that the contractor stop the work whenever in his reasonable opinion it may be necessary for the proper performance of the contract. In exercising the foregoing authority, the design professional shall act through the County and the issuance of instruction to the County shall constitute a full acquittance by the design professional of his responsibility hereunder.

6. The appropriate design professional shall review and approve shop drawings, samples, and other submissions of the contractor for conformance with the design concept of the project and for compliance with the information given in the contract documents. This shall include review of Operation and Maintenance (O&M) Manuals.
7. As needed for the project, the design professionals shall work with any LEED® consultants and commissioning authorities involved with the project, providing any design information and calculations needed for the timely completion of their work.
8. The design professional may assist the County in preparing change orders.
9. The design professional shall assist County in the final inspection of the facility and development of a “punch list.” Design professional shall assist in the inspection after the items on the “punch list” have been corrected.
10. The design professionals shall create as-built drawings. Drawings are generally prepared from contractor red-line drawings without field verification by the design professionals. Where certified as-built drawings are required by regulatory agencies, the appropriate design professional who certifies the drawings shall visit the site during the construction and provide on-going inspection of the relevant portions of the project. This inspection shall be coordinated with the County’s inspection services.

V. SUBMITTALS

A. Drawings

1. Drawings are those by which a project is bid and constructed, including plan views, elevations, sections, wall sections, schedules, and details.
2. Drawings shall be to a scale appropriate for the project and information shown. Detail drawings shall be sized and scaled to show all pertinent information. Notes and drawings shall be sized to be legible on both full-sized and half-sized drawings. Lettering shall be a minimum of 0.08”, with 0.10” preferred.
3. Title sheet of drawings shall indicate the phase and/or percentage submittal for the set.
4. Drawings submitted for approval by regulatory agencies and/or authorities having jurisdiction shall bear all required stamps, seals, and certifications from the appropriate design professional.
5. Architectural and engineering drawings shall include the completed statement of professional certification required under Maryland law.

B. Specifications

Specifications are the written standards that set the level of quality of the materials and workmanship by which the project is constructed. Specifications shall use the Construction Specifications Institute (CSI) division numbers MasterFormat, current edition, and the three-part section format.

C. Reports

1. Geotechnical

- a) When requested by the Public Buildings Design Section, the design professional shall perform a geotechnical study, including soil borings as needed. Information shall be adequate, correct, and reasonably complete for the intended purposes of planning, design, cost estimating, and determination of construction feasibility.
- b) The subsurface exploration and evaluation and resulting report shall be performed under the direct guidance, direction, and control of a geotechnical engineer.
- c) Report shall include geology of the site; history of project site; boring plan; boring logs; soil characteristics, classifications, and bearing capacities; water table; rock line; foundation analysis; recommendations for foundations, slabs, utilities, pavement, slopes, ground water control, stabilization and storm water management; identification of potential problems; and evaluation of site.
- d) A structural engineer shall be responsible for using the geotechnical information in design of footings and foundations.

2. Hazardous Materials

When requested by the Public Buildings Design Section, the design professional shall perform a hazardous materials study. The study shall be performed by a certified Industrial Hygienist and shall include test results of existing conditions, analysis of test results, and recommendations for abatement.

D. Cost Estimates

The design professional shall engage a professional construction cost estimator. Cost estimates may be provided during programming/study, schematic design, design development, and construction documents phases as required by the Public Buildings Design Section. Cost estimates may include estimates for specific construction items or estimates organized by specification classification. Where applicable, estimates shall provide separate costs for construction alternates. Cost estimates shall be based on an appropriate construction start date, to be included in the estimate. If the cost estimate exceeds the previously stated construction budget, the design documents may be required to be revised until the design documents and cost estimate are acceptable to the county, in accordance with the design professional's contract.

E. Schedules

At the start of a design project, the design professional shall provide a schedule acceptable to the County indicating time durations for each design phase. Schedules shall include submittals to review agencies and authorities having jurisdiction. Schedules shall include the design, bid, and construction administration phases.

F. Calculations

1. Provide calculations for heating, ventilating, and air conditioning equipment and distribution systems, including design conditions and number of occupants, in accordance with applicable building and mechanical codes.
2. Provide calculations for lighting requirements and layout, in accordance with applicable electrical codes.
3. Provide calculations for required number of parking spaces, including accessible parking spaces.
4. Provide storm water calculations in accordance with the Storm Drainage Design section of this Manual, as required.
5. Provide calculations for occupancy and egress requirements, in accordance with applicable building and fire codes. As needed, include any code analysis required for these calculations.
6. For projects intended to receive LEED® certification, provide all required calculations for design-related credits.
7. When requested for a project, provide all energy model calculations, including but not limited to baseline design and proposed building energy requirements.
8. Calculations shall be provided as and when required by review agencies. Design calculations shall be provided at appropriate design phases as determined by the Public Buildings Design Section.

G. Information for Review/Approvals

1. Architectural Review Board (ARB)

The design professional may be required to make a presentation to Baltimore County's Architectural Review Board. Presentation is to include color photographs showing the site and surrounding areas, floor plans, elevations, site plans, and exterior color boards. Both a preliminary and final presentation may be required. Acceptance by the ARB is part of the design approval process.

2. Developers' Review Committee (DRC)

When required, the design professional shall complete the application and checklist for a hearing before the Developers' Review Committee (DRC) and shall provide the number of sets of site plans required by the DRC. These site plans shall meet the requirements of the current DRC checklist.

3. DPW - Engineering

Sufficient copies of design submittals shall be provided to the Buildings Design Section to allow for review by appropriate Sections within the Bureau of Engineering and Construction. These reviews shall include examination for compliance with other sections of this Design Manual.

4. Using Agency(ies)

Sufficient copies of design submittals shall be provided to the Public Buildings Design Section to allow for review by appropriate agencies which will use the proposed facilities.

5. Federal, State, and County Regulatory Agencies (Soil Conservation District (SCD), DEPRM, Army Corps of Engineers (COE), etc.)

When required, the design professional shall complete any required applications and checklists and submit the number of sets of plans needed for review by applicable Federal, State, and County regulatory agencies. Copies of applications and transmittals shall be provided to the Public Buildings Design Section. The design professional shall keep the Public Buildings Design Section apprised of the progress of agency reviews and shall provide the Public Buildings Design Section with copies of correspondence between the agencies and the design professional.

6. Permits

- a) The necessary building permit information shall include the required number of site plan(s), the required number of sets of the building drawings individually signed and sealed by the appropriate responsible design professional, and the required number of plan review data sheets with original seal and signature.

- b) The necessary grading and stormwater management permit information shall include the required number of civil plans, individually signed and sealed by the appropriate responsible design professional, and any required forms and calculations.

7. Maryland Historic Trust (MHT) and Baltimore County Landmarks Preservation Committee (LPC)

Buildings and/or sites of historic value may require presentation and submittal of plans to the Landmarks Preservation Committee (LPC) and/or the Maryland Historic Trust (MHT). If the project is of historic import, the design professional shall provide any studies, drawings, and specifications required by the LPC and MHT and may be required to present this information in meetings with these organizations.

8. BGE

Provide information needed on energy loads of building and any site appurtenances and proposed locations of service entries, transformers, and other distribution equipment. Complete any required forms and provide appropriate building and site plans with any required seals and signatures. Complete the BGE online Service Application for the project. Provide copies of all correspondence with BGE.

9. LEED®

If the County directs that the building shall meet any level of LEED® certification, the design professional shall be responsible for registering the project and making any required submittals to the U.S. Green Building Council, with copies provided to the Public Buildings Design Section. Provide copies of all correspondence with USGBC.

H. As-Builts

1. The design professional shall furnish the County at the completion of construction a complete set of As-Built mylar record drawings based on marked-up prints received from the contractor, shop drawings, addenda, change directives, requests for information responses, and other data utilized for construction. These As-Built record drawings shall also be furnished to the County as electronic files. (Required format is specified in the CADD Section of this Manual.)
2. As required by regulatory agencies and any applicable authorities having jurisdiction, the appropriate design professional shall provide and certify signed and sealed construction documents showing surveyed as-built field conditions.



BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS

SKETCH TITLE
PROJECT TITLE
BUILDING NAME

REFERENCE:

SCALE:

DATE:

DRAWN BY:

SKETCH #:

REF. DRWG. #:

CONTRACT #:

JOB ORDER: