



00 00 00 PROCESSING THE WORK

The *Ohio State University Building Design Standards (BDS) Manual* is a living document established to guide Design Consultants through the phases of project development. It serves to consolidate and organize the range of institutional knowledge retained by the University Facilities Operations and Department (FOD) staff.

Compliance with the *Ohio State University Building Design Standards Manual* is a contractual obligation of consultants retained under the University's standard *Architect-Engineer Design Services Contract*, *Professional Services Contract* or *Professional Services Basic Ordering Agreement*. Responsibility for any non-compliant design and/or resulting installation falls within the respective consultant's scope of services. It is important that this document be reviewed, understood and any exceptions prior document reviews. The Designer is expected to comprehend all aspects of the standards, including document preparation and review guidelines covering requirements for all submissions from schematic design through closeout requirements. In addition, dissemination of all pertinent sections of this manual to sub-consultants or appropriate members of the project team is the responsibility of the lead consultant under contract.

Please note that this document is not distributed to contractors. Therefore, items herein identified as part of Contractor or CM responsibility will only become known when shown on consultant's contract documents. *The Designer's documents are to include information pertinent to the contractor's scope of work (such as as-built information) so that the standards may be consistently applied.* Therefore, consultants' document coordination effort must include those items in the *Ohio State University Building Design Standards Manual* that impact a contractor's or CM's ability to conform as well. This requires that consultants include all such contractor requirements from this manual in respective CSI specification sections and/or Drawings prior to document release.

The information contained within the *Ohio State University Building Design Standards Manual* is not intended to limit design expression or material selections, but rather guide Designers in ways to expedite project completion within acceptable university guidelines. Exceptions to any design standard herein may be openly discussed and modified if the designer obtains written approval through the Facilities Design and Construction (FDC) Project Manager, though the Building Design Standards variance process.



1. Introduction

OSU has a robust group of administrative departments that support the physical needs of the university's educational mission. They plan, design and care for the buildings and grounds, house and feed students, and generate the energy that heats, cools and powers our buildings. Within the many departments that deal with facilities on campus, the majority of design team interaction occurs with the office of Facilities Design and Construction (FDC). The FDC Project Manager will facilitate coordination of all the facility stakeholders and User Groups on campus. Below is an overview of the facility related departments that participate in the OSU design process.

1. 1 Facilities Department Organization and Function

The various facilities and design departments that directly participate in projects are described below.

Office of Senior Vice President for Administration and Planning

The Office of the Vice President provides leadership to the numerous departments that comprise the entire facilities organization. Administration and Planning's facilities related departments are dedicated to the day-to-day operation of the University:

1. Facilities Operations and Development
2. Planning, Architecture and Real Estate
3. Transportation and Traffic Management

Facilities Operations and Development (FOD)

The Office of the Vice President for FOD provides leadership to the numerous departments that comprise the majority of facility organizations. FOD coordinates efforts across those departments to ensure that the skills and resources of the Facilities Organization support the University's academic mission. They also support the sustainability mission of the University as they lead the effort to steward OSU's resources in the most efficient and effective manner.

Facilities Design and Construction (FDC)

Design and Construction (FDC) oversees campus design process, new construction, as well as all renovation projects; technical support services; and building design standards.

Facilities Design and Construction (FDC) is a division of Facilities Operations and Development (FOD) with the primary responsibility to deliver design and construction projects for the University. FDC is led by the Assistant Vice President for FDC, and the staff includes:

- **Project Delivery Services:** Consists of 5 teams that provide project and construction management services to deliver all campus and medical center design and construction projects. Closely collaborates with other FOD entities and campus customers in pre-



project development, project execution, and post-project tasks to ensure successful and timely projects.

- **Program Management:** The FDC Project Managers are the primary contact for the AE Teams and as such drives the execution of projects across all functional areas; identifying process problems, gaps & inefficiencies. Facilitating focus groups, leading improvement teams. Policy, procedure, training & compliance. Project support & services: contracts, document management, funding, approvals, BOT materials, reporting analytics, project management systems etc.
- **Project Technical Services:** Engineering and architectural consulting services that support project delivery and other university initiatives. Ensure quality assurance of construction documents for code and building design standard compliance. Also includes GIS and Mapping Services and Signage coordination.

Office of Planning Architecture and Real Estate (PARE):

PARE is the University's responsible entity for all Urban Planning, architectural design, landscape/hardscape design occurring on campus. This includes the entirety of the external built environment as well as public facing interior spaces such as lobbies and larger classrooms. Through the FDC project process, PARE is responsible for oversight and approval of all architectural, landscape, and hardscape designs.

- **Design (architectural and landscape/hardscape):**
The PARE design team (University Architect (UA), University Landscape Architect (ULA), Campus Planners) oversees the university's design process for building and landscape projects which are managed and administered through FDC. As part of this process, PARE manages the Design Review Board that considers projects for appropriateness to the campus context and compatibility to the planning and design guidelines. The University Architect and University Landscape Architect facilitate the design approvals through the Design Review board for projects over \$4M and approve directly projects under \$4M. The UA and ULA responsibilities also include oversight and approval of signage, environmental design, Demolition approvals, Civic Structure and historic preservation considerations. See <https://pare.osu.edu/services/planning-and-design> for links to list of planning and design resources below that provide more detailed information.

University Architect Roles and Responsibilities

University Landscape Architect Roles and Responsibilities

PARE Program Manager Roles and Responsibilities

[Design Guidelines for Buildings and Landscape](#)

[Design Review Process](#)

Design Review Board:

Civic Structure Guidelines

[University Signage Standards](#)

Design Approvals under \$4M

Materials Selection Process and Construction Mock-up



00 00 10 NOT USED

00 00 11. NOT USED

00 00 12. NOT USED

00 00 13. THE PROGRAM OF REQUIREMENTS:

Prepared in cooperation with the Using Agency concerned and with advice from other university agencies, the Program of Requirements is the single written source of information concerning the scope of the project and the detailed requirements to be achieved by the project. It is essential, at the very beginning of the design process that the A/E seeks clarification from the University Architect regarding any question generated from its study of these Building Design Standards or the POR. All variations from these Building Design Standards shall be documented according to the process provided on the Building Design Standards web page, fod.osu.edu/resources/. When appropriate the University Architect will refer these questions to the Project Planning Team for resolution and response. Program changes will not be accepted solely upon request of the Using Agency's representatives.

- .1 DESIGN WITHIN AVAILABLE FUNDS: A construction/renovation budget, which is to include life cycle and sustainability elements, is developed for each project that establishes the maximum funds available for construction. The A/E shall continually monitor program requirements and cost estimates to assure that the project is designed within the available funds and does not deviate from the quality standards established in these Building Design Standards. Estimates of costs shall be projected to the proposed mid-point of construction. Estimates shall be developed in Unifomat ii level 2-4 from conceptual stages through 50% DD and then migrate to MasterFormat SOV. Estimate of cost shall be included in submittals and they shall be provided in both hardcopy and electronic format (Microsoft Excel). All labor, material, and equipment shall be broken out separately.

Should the A/E have doubts about satisfying at least priorities 1 and 2 of the POR, they must inform the University Architect and Project Manager without delay. Should the lowest bona fide bids for the construction of the project exceed the Fixed Limit of Construction Cost, the A/E will be required to assist in bringing the project back within the funds available. This may require modifying the drawings and specifications for the project without additional charges as per the contract for services with the university.

- .2 ADD-ALTERNATES: The university prefers to avoid deduct-alternates unless circumstances justify their use. Carefully selected add-alternates are desirable to obtain the maximum number of priority 3 items and to fully utilize the available funds. Add-



alternates must be items which can be added to the "base bid" design without causing major changes in the "base bid" design package.

- .3 OHIO STATE BRAND GUIDELINES: The A/E and the university's project team shall reference the Ohio State Brand Guidelines website (brand.osu.edu/) as it may apply to the project.
- .4 OSEP VERIFICATION: The A/E and University project team will verify if any building(s) has had Ohio State Energy Partners (OSEP) install any equipment intended to lower the building's energy usage as part of the Program of Requirement. If so, the project team will work with Ohio State's Energy Services department to address any impacts and/or costs that may affect said equipment and its intended functionality.
- .5 CNI coordination and integration: The A/E and University project team shall evaluate opportunity cost affiliated with items identified on the capital needs inventory (CNI) by consult with the respective campus facility Maintaining Authority (i.e. FOD Operations or Student Life or Wexner Medical Center Facilities, etc.) and develop a plan of action.

00 00 14. THE PROJECT SITE:

The selected site for the project is described in the POR. The University Framework Plan, Landscape Master Plan, and District Plans, which have been adopted by the Board of Trustees, include design and development guidelines that provide a diagrammatic framework for land use, circulation, parking, landscape design, and building placement. Information about those plans is available on The Ohio State University Master Planning website (<https://pare.osu.edu>). For most sites, there are area-specific guidelines that are applicable to defined sectors of the campus and provide the A/E with guidance concerning the development of the project site. The A/E shall visit the site prior to the Initial Planning Conference in order to understand the limitations and opportunities at the site and to formulate any questions about site conditions and the application of design and development guidelines. The A/E is free to suggest modifications as long as suggested rearrangements clearly adhere to plan principles and guidelines. The A/E is encouraged to retain a professional landscape architect and/or a physical planner for the purpose of dealing with site issues. The use of the services of a professional landscape architect will be required when the university determines that those services are needed to fulfill project requirements.

- .1 See Ecosystems Services section in 18 50 00 .

00 00 15. CONFERENCES:

- .1 INITIAL PLANNING CONFERENCE: Immediately after the A/E has been confirmed by the University, the University Project Manager will schedule a meeting for the purpose of discussing the University Conceptual Guidelines and general requirements of the program and procedures for expediting the A/E's work. It is MANDATORY that the A/E's professional consultants, (including his fire protection, plumbing, HVAC, elevator, and electrical consultants) attend this conference.



- .2 **ADDITIONAL CONFERENCES:** Additional conferences will be held to (1) discuss and clarify ways in which the University's Conceptual Guidelines relate to the project, (2) to clarify the Program of Requirements, (3) to review and discuss the A/E's evaluation of achievability of priority 1 and 2 requirements within budget constraints and to assist in definition of alternates, which will become an important component of the construction documents 4) Sustainability Charrette – refer to 00 00 17.1.3,. Participants in these conferences are named in the Program of Requirements. All conferences will be scheduled by the University Project Manager.
- .3 **SUSTAINABILITY COMPLIANCE PROCESS**
 - .3.1 SUSTAINABILITY CHARRETTE (see 00 00 17.1.3)
 - .3.2 SCHEMATIC SUSTAINABILITY WORKSHOP #1 (see 00 00 17.1.3.2)
 - .3.3 SCHEMATIC SUSTAINABILITY WORKSHOP #2 (see 00 00 17.1.3.3)
 - .3.4 DESIGN DEVELOPMENT SUSTAINABILITY WORKSHOP
(see 00 00 18.1.1.8)
 - .3.5 CONSTRUCTION DOCUMENTS SUSTAINABILITY WORKSHOP
(see 00 00 19.1.1.8)
 - .3.6 CONSTRUCTION KICKOFF FOR SUSTAINABILITY (see 00 00 20.1.1.8)
 - .3.7 SUSTAINABILITY DEBRIEF (see 00 00 21.1.1.4)
- .4 **BASIC SECURITY PLANNING CONFERENCE:** The A/E and the Project Manager shall consult with the Department of Public Safety to determine the specific security requirements for the project. Refer to the BDS Appendix Y. Included the agreed upon security requirements in the POR.
- .5 **CONFERENCE MEMORANDA:** The A/E is responsible for the proper recording of the business content of all conferences. Within seven days following any conference, copies of a memorandum, containing a complete summation of decisions and actions and affecting the project, shall be delivered via the university's project management software. The A/E will deliver memoranda copies to all conferees other than university participants.
- .6 **FORMAT FOR MEMORANDA:** Memoranda shall be numbered in consecutive order. Summations shall be in outline form with numbered paragraphs and alphabetical sub-paragraphs. Although statements should be brief, each statement shall convey the entire message and shall clearly state the problem or directed decision. All pertinent information shall be provided in the statement: one-word statements, and terse phrases and clauses should be avoided.

**00 00 16. PROJECT STAGES:**

During the project period the A/E is required to make submittals which coincide with the A/E scope of services and contractual agreement for fee payment. The main stages are:

- .1 PRE-DESIGN
- .2 SCHEMATIC DESIGN DOCUMENT STAGE.
- .3 DESIGN DEVELOPMENT DOCUMENT STAGE.
- .4 CONSTRUCTION DOCUMENT STAGE.
- .5 CONSTRUCTION STAGE
- .6 POST CONSTRUCTION / BUILDING PERFORMANCE _

00 00 17. PRE-DESIGN & SCHEMATIC DESIGN DOCUMENT STAGE:**Pre-design phase**

A [Project Kick Off Meeting](#) will be scheduled at the beginning of this phase to confirm the project goals, expectations, budget and schedule. The programming phase will confirm that the design requirements meet the programmatic needs of the user group. If a previous study has been performed, then the team will validate the planning and design goals, budget, etc. This phase includes an initial study of site constraints, investigation of existing conditions, code analysis, diagrammatic floor and stacking plans, a space program, a building system description, a summary schedule, and a budget estimate.

Pre-design phase reviews and confirms the PoR, Project Budget, Schedule and project siting.

- .1 POR
- .2 Budget
- .3 Schedule
- .4 Project Site
- .5 Enabling work

I. Project Kickoff Meeting

A project kickoff meeting is scheduled prior to the start of design and includes the entire project team_. The objective of the kickoff meeting is to communicate the project goals, budget scope and schedule to all parties to ensure everyone is aligned from the beginning. The Project Manager comes prepared with a good understanding of the project schedule, scope, and budget to be able to lead this discussion. A typical project kickoff agenda includes:

- Introduction of project team members
- Overview of project vision, goals, and objectives
- Project scope and budget
- Schedule
- Roles and Responsibilities



- Team Structure
- Lines of Communications
- Future meetings

.1 SUSTAINABILITY COMPLIANCE PROCESS

- .1.1 SUSTAINABILITY APPLICABILITY MATRIX – All projects shall utilize the Sustainability Applicability Matrix (SAM) ([SAM ≤ \\$75,000 construction budget](#) or [SAM > \\$75,000 construction budget](#)) to identify the sustainability requirements in Division 18 applicable to the project based on project type, scope, and budget. The Sustainability Applicability Matrix shall be referenced in the Owner's Project Requirement (OPR) document submitted to the Project Sustainability Stakeholders Group (see .1.3 for definition) for review and to the Project Manager for final approval. The Sustainability Applicability Matrix also includes the design stage checklists that should be completed as part of the design process. After first Sustainability Applicability Matrix is developed by the University, it shall be distributed to the A/E team and is the responsibility of the A/E team to maintain.
- .1.2 OWNER'S PROJECT REQUIREMENTS – The University will develop an Owner's Project Requirements (OPR) (Links to [OPR ≤ \\$75,000 construction cost](#) or <https://fod.osu.edu/sites/default/files/opr.docx> [OPR > \\$75,000 construction cost](#)) document which shall define the Owner's expectations of how the project will perform. The OPR shall include an outline of the sustainability targets and approach for each of the requirements from Division 18, including Energy Use Intensity (EUI) and Water Use Intensity (WUI) design targets. The OPR shall then be updated by A/E throughout the design process as decisions are considered that affect any identified systems or expectations.

OPR shall also include an evaluation of opportunity costs affiliated with items identified on the capital needs inventory (CNI) by consult with the respective campus facility Maintaining Authority (i.e. FOD Operations or Student Life or Wexner Medical Center Facilities, etc.).

1.3 SUSTAINABILITY WORKSHOPS

- .1.3.1 SUSTAINABILITY CHARRETTE – For each qualifying building construction and renovation project with a total project budget at or above the Board of Trustees Authorization threshold (\$4 million), the A/E shall schedule a Sustainability Charrette meeting with the Project Team (including but not limited to the A/E and consultants, and Construction Manager where applicable) and the Project Sustainability Stakeholders Group. Sustainability Charrette agenda shall be developed by A/E team in conjunction with the Project Team. Sustainability Charrette shall occur in Pre-Design. The purpose of the Sustainability Charrette is to set goals for the project, and hear ideas/priorities from the Project Sustainability Stakeholders.



The Project Sustainability Stakeholders Group is comprised of university partners and subject-matter-experts for each of the sustainability categories, including but not limited to:

- .1 Senior Director Sustainability and Strategic Services
- .2 University Engineer
- .3 University Architect
- .4 University Landscape Architect
- .5 FOD Sustainability and Strategic Services
 - .5.1 Assistant Director of Sustainability
 - .5.2 Sustainability Analyst
- .6 FOD Energy Services
- .7 FOD Building Automation Shop
- .8 FOD Building Envelope Team
- .9 ~~Planning, Architecture and Real Estate—Facilities Information and Technology Services~~
- .10 Technical Services Group
- .11 Ohio State Energy Partners representative
- .12 for Wexner Medical Center(WMC) projects, include:
 - .12.1 WMC Sustainability
 - .12.2 WMC Engineering
 - .12.3 WMC Planning
 - .12.4 WMC Director of Environmental Services
- .13 for Student Life projects, include Student Life Sustainability and Energy Management or their designee
- .14 for Athletics or Business Advancement projects, include Athletics and Business Advancement Sustainability Coordinator or their designee.



- .15 Third-Party Sustainability Subject Matter Expert
 - .16 Other as identified necessary for the project.
- .1.3.2 SCHEMATIC SUSTAINABILITY WORKSHOP #1 – For each qualifying building construction and renovation project with a total project budget at or above the Board of Trustees Authorization threshold (\$4 million), the A/E shall schedule a Sustainability Workshop meeting with the Project Team and Project Sustainability Stakeholders Group soon after Schematic Design Begins. The purpose of this workshop is to explore design solutions to meet goals identified in the Sustainability Charrette, and identify potential feasibility studies to be completed during Schematic Design to meet goals.
- .1.3.3 SCHEMATIC SUSTAINABILITY WORKSHOP #2 – For each qualifying building construction and renovation project with a total project budget at or above the Board of Trustees Authorization threshold (\$4 million), the A/E shall schedule a second Sustainability Workshop meeting with the Project Team and the Project Sustainability Stakeholders Group toward the end of Schematic Design, before Value Engineering begins. The purpose of this workshop is to share the results of the feasibility studies, including Embodied Carbon Structural System Studies, related to sustainability conducted in Schematic Design, and determine which systems and aspects needed to achieve Sustainability Goals should be included in the project budget.
- .1.3.3.1 EMBODIED CARBON STRUCTURAL SYSTEM STUDIES – All projects with a construction budget exceeding \$4 million and which include the construction of >10,000 square feet of new structural systems shall complete an Embodied Carbon Structural Systems Study prior to the Sustainability Workshop completion. The Embodied Carbon Structural Systems Study shall consist of (1) typical structural bay of the Project designed with (3) different iterations. Each iteration should vary one significant structural constraint or material and the embodied carbon for each iteration should be measured in units of kgCO₂e per framed square foot. See [Embodied Carbon Structural Study Worksheet](#) for further examples and instructions.
- .1.4 SUSTAINABILITY CHARRETTE NARRATIVE – A/E shall document the Sustainability Charrette discussion, including any key input and/or initial decisions made in the form of a Sustainability Charrette Narrative. This narrative shall be issued to the Project Sustainability Stakeholders Group within five (5)



working days of the Charrette for their review and comment. At a minimum, the narrative shall include:

- .1.4.1 The design approach for each of the applicable sustainability sections within Division 18.
- .1.4.2 Design strategies to investigate to achieve the design targets for Site Energy Use Intensity (EUI) and Water Use Intensity (WUI).
- .1.4.3 The agreed upon frequency for the project's sustainability meetings with the Project Sustainability Stakeholders Group.
- .1.5 BASIS OF DESIGN – A/E shall develop a Basis of Design (BOD) narrative and deliver in early SD in response to the project OPR and Sustainability Charrette narrative. The purpose of the Basis of Design is to outline the project's approach to all items outlined in the project OPR and the University's Sustainable Design & Construction Policy. A program of requirements (POR) shall be developed prior to design to accompany the BOD. The BOD must be updated throughout design development as decisions are considered that affect any identified systems or expectations.
- .1.6 COMMISSIONING & SUSTAINABILITY REVIEW – Commissioning proposals for Division 18 services shall be requested prior to Schematic Design and the Commissioning Provider (CxP) shall be engaged throughout the design process. Building Systems Commissioning and Water Systems Commissioning (Cx) and Building _Enclosure Commissioning (BECx) to be independent third-party prior to schematic design through at least the 12-month warranty period with exact end date to be determined.
- .1.7 COMMISSIONING & SUSTAINABILITY REVIEW SCOPE – The Commissioning Authority (CxA) shall be under contract for Division 18 service prior to Schematic Design. Building Systems Commissioning and Water Systems Commissioning (Cx) and Building Enclosure Commissioning (BECxA) shall act as the 3rd party verification for sustainability compliance by reviewing and confirming the project's sustainability standards from Division 18.
 - .1.7.1 COMMISSIONING PLAN – provide outline and Table of Contents, include commissioning plan for the building _enclosure and Full Cx Plan ongoing.
 - .1.7.2 BUILDING SYSTEMS COMMISSIONING –
 - .1.7.2.1 Confirm proposed systems and strategies are valid for project intent by reviewing and providing comment to the



OPR, Basis of Design, and SD phase documents. Report issues and maintain in a log until resolved.

.1.7.2.2 Confirm assumptions, parameters, and output for SD energy modeling. Incorporate assumptions for envelope design from SD Energy Simulation.

.1.7.3 WATER SYSTEMS COMMISSIONING – Confirm applicable goals and assumptions are used for the Water Use Intensity model.

.1.7.4 BUILDING ENCLOSURE COMMISSIONING – Include outline and framework for required testing, set up, and process for air and/or water infiltration.

.1.8 ENERGY

.1.8.1 A/E shall provide preliminary Energy Model following the standards in Division 18. The model shall include one design case which meets the prescriptive energy targets.

.1.8.2 A/E shall consult with the FOD Building Automation Shop on design and integration of Automated Demand Response into the project as outlined in Division 18.

.1.8.3 Life cycle cost analyses (LCCA) shall be used to compare designs of energy systems. The LCCA shall be performed by the A/E and validated by the CxA.

.1.8.4 A/E shall submit a prescriptive energy study, describing the design alternate and including details which will be priced by project to determine the first cost of prescriptive energy measures.

.1.9 WATER

.1.9.1 A/E shall provide preliminary project WUI model using the guidelines in Division 18.

.1.9.2 Life cycle cost analyses (LCCA) shall be used to compare designs of water systems. The LCCA shall be performed by the A/E and validated by the CxA.

.1.10 MATERIALS – A/E shall consult with [Recycling & Refuse Services](#) Supervisor and any outside haulers to ensure that sufficient accessibility and design standards are met.

.1.11 ECOSYSTEM – A/E shall complete the [Ecosystems Services Assessment](#) requirements as outlined in Division 18.

.1.12 USER EXPERIENCE



- .1.12.1 INDOOR AIR QUALITY – A/E shall demonstrate compliance with Building Entrance requirements as outlined in Division 18.
 - .1.12.2 THERMAL COMFORT – A/E to provide narrative to describe thermal comfort strategies, consider the strategies identified in Division 18.
 - .1.12.3 ACOUSTIC PERFORMANCE – A/E shall provide a design narrative to describe how the project addresses acoustical performance as identified in 18 60 50 and Appendix J.
 - .1.12.4 DAYLIGHT ANALYSIS – A/E shall evaluate daylight levels to ensure project follows section 18 80 60.
 - .1.12.5 LIGHTING PLAN – A/E shall develop a Lighting Plan and design narrative to the Project Team following section 18 80 60 demonstrating how light levels have been designed for the various tasks and activities within the project.
 - .1.12.6 CONNECTION TO NATURE – A/E shall provide narrative to the Project Team describing the three (3) biophilic design strategies from section 18 60 70 and the reasoning for integrating each strategy, including any research if applicable.
- .2 SUBMITTAL shall consist of:
- .2.1 A site plan, showing adjacent buildings, existing and proposed contours, and existing sewers and other utilities. Refer to Paragraph 00 00 14 for requirements relative to siting of the project. If a project involves any site improvements, the site plan shall be based on a surveyed base map.
 - .2.2 All floor plans - For each room or space, identify with Program of Requirements Room Name and Program of Requirements Item Number. Also see 00 00 41.8.
 - .2.3 All elevations.
 - .2.4 A section through the entire building selected to best show the relationships of architectural and engineering features.
 - .2.5 Equipment and furniture layouts for all floors.
 - .2.6 A Database file which compares the Assignable Square Footage (ASF) of the Program of Requirements to that of the Schematic Design Document. This submittal must be in the following format:

Title Block
Project Name:



Project Number:

Project total gross square feet (GSF):

Column	Column Header
1	PoR Item Number
2	PoR Room Name
3	PoR Priority
4	PoR Number of Rooms
5	PoR ASF
6	Schematic Design Number of Rooms
7	Schematic Design ASF
8	PoR/Schematic Design ASF Difference
9	Comments

This file should also contain a subtotal by Program Item Number Group (e.g. all spaces under Program Item Number 1.0 would be subtotaled.) A project total ASF should also be included (totals all Program Item # Group ASFs).

- .2.7 Tabulation of floor areas, cubic contents, and a construction cost estimate shall be provided in both hardcopy and electronic format (Microsoft Excel). All labor, material, and equipment should be broken out separately. Show estimated cost per square foot and per cubic foot. Indicate new construction costs, remodeling costs, including major and minor areas of remodeling, with approximate areas. Coordinate with Program of Requirements item numbers. Tabulations may be combined. Also see 00 00 13.
- .2.8 An outline specification, indicating materials, and types of construction. Include a description of each plumbing, HVAC, fire protection, and electrical system design concepts, a one-line diagram of the electrical service (if applicable) and a narrative description of the design criterion for the noise and vibration control for these systems.
- .2.9 Schematic models usually are not required, but study models might be considered for submittal at this stage, if unusual conditions suggest that study models might aid in the review of the drawings.
- .2.10 A letter describing conceptual design element life cycle analysis shall be submitted.
 - .10.1 See section 18 80 00.
- .2.11 HVAC schematic one-line flow diagrams for the air systems, hydronic systems, and steam systems.
- .2.12 Provide and updated Schedule of Values (SOV), in CSI format Level 2 or 4 as required by the Authority Having Jurisdiction (AHJ)
- .2.13 Any BIM requirements (state here; otherwise this added section is not required)



- .2.14 Environmental Assessment, if applicable (state here; otherwise delete)
- .2.15 Sustainability Applicability Matrix
- .2.16 Other documents mentioned in 00 00 17.1.
- .2.17 [Design Stage Deliverable Checklist](#)

00 00 18. DESIGN DEVELOPMENT DOCUMENT STAGE:

DRAWINGS AND Project Manual shall be prepared in conformance with Section 153.50 and 153.52 of the Ohio Revised Code. The A/E shall work with the University Project Manager to identify the appropriate submittal content and timing for the formal University wide review. Refer to the Review Process Summary at: <http://fod.osu.edu/project-delivery> The Ohio State University requires separate documents to be prepared for each of the following: General; Plumbing; HVAC (Heating, Ventilating, and Air Conditioning); Fire Protection; and Electrical. [Documents may be combined when permitted by Ohio law and approved by the Technical Services Group (TSG).]

Drawings for this submittal should be progress prints made from partially finished construction document drawings. The Project Manual shall include a draft of Divisions 00 and 01 and the outline specifications shall be updated in accordance with comments received at the conference for review of schematics. It is recommended to start the Construction Document submittal at this time. Provide an updated SOV for this submittal. Additionally, provisions for first phase VE, if so required, to be included and reconciled with the university and maintaining authority. A quantity take off detailed estimate of cost (Level 2 or 3 as determined by the university's Project Manager) shall be included in this submittal and it shall be provided in both hardcopy and electronic format (Microsoft Excel). All labor, material, and equipment should be broken out separately. Square foot and lump sum estimates are not acceptable.

.1 SUSTAINABILITY COMPLIANCE PROCESS

- .1.1 GENERAL – The Sustainability Applicability Matrix shall be updated by the A/E team and submitted to the Project Sustainability Stakeholders Group for review and the Project Manager for approval.
- .1.2 COMMISSIONING & SUSTAINABILITY REVIEW
 - .1.2.1 BUILDING SYSTEMS COMMISSIONING
 - .1.2.1.1 Confirm assumptions and parameters for DD energy modeling



- .1.2.1.2 Develop a full commissioning plan.
 - .1.2.1.3 Deliver results of review and issues log
 - .1.2.1.4 Commissioning Authority (CxA) to review assumptions, parameters, fixture types, and output used in the WUI calculation.
- .1.2.2 BUILDING ENCLOSURE COMMISSIONING – Revise and update plan following 100% DD energy modeling.
- .1.3 ENERGY
 - .1.3.1 A/E shall provide an updated energy model as outlined in Division 18.
 - .1.3.2 If the Project Team or Project Sustainability Stakeholders Group requests a life cycle cost analysis (LCCA) comparison of the designed energy systems, the LCCA shall be performed by the A/E and validated by the CxA.
- .1.4 WATER
 - .1.4.1 A/E shall provide updated project WUI model along with information associated with the reasoning behind updated data inputs.
 - .1.4.2 If the Project Team or Project Sustainability Stakeholders Group requests a life cycle cost analysis (LCCA) comparison of the designed water systems, the LCCA shall be performed by the A/E and validated by the CxA.
- .1.5 MATERIALS
 - .1.5.1 A/E shall provide the initial [Sustainable Materials Calculator](#) or affidavit demonstrating compliance with [Prescriptive Materials Matrix](#) (as applicable to project scope) following the standards in Division 18. Purpose of the calculation will be to detail plan for implementation.
 - .1.5.2 A/E shall provide a [Materials Management Plan \(MM Plan\)](#) and narrative following the standards in 18 50 50. In addition to the MM Plan document, the A/E shall include site/building plans indicating the space and layout for the storage of waste materials.
- .1.6 ECOSYSTEM – A/E shall update the [Ecosystems Services Assessment](#) based on the updated design.
- .1.7 USER EXPERIENCE



- .1.7.1 INDOOR AIR QUALITY (IAQ) – Define space types per Division 18 60 30 and perform ventilation calculations
- .1.7.2 THERMAL COMFORT - Perform Thermal Comfort analysis – [CBE Thermal Comfort Tool](#) and requirements in Division 18.
- .1.7.3 DAYLIGHT ANALYSIS – A/E shall provide updated evaluation of daylight levels to ensure project follows section 18 60 60.
- .1.7.4 LIGHTING PLAN – A/E shall provide updated Lighting Plan and design narrative.
- .1.7.5 CONNECTION TO NATURE – A/E shall provide updated narrative to the Project Team describing the three (3) biophilic design strategies from section 18 60 70 and the reasoning for integrating each strategy, including any research if applicable.
- .1.8 SUSTAINABILITY WORKSHOP – For each qualifying building construction and renovation project with a total project budget at or above the Board of Trustees Authorization threshold (\$4 million), the a/E shall schedule a Sustainability Workshop meeting with the Project Team and the Project Sustainability Stakeholders Group at 50D. The purpose of this workshop is to revisit Sustainability Goals, and for the design team to report progress to the Project Sustainability Stakeholders Group.
- .2 SUBMITTAL shall consist of:
 - .2.1 Site plans showing adjacent buildings, proposed site improvements, existing and proposed contours, existing and proposed sewers and other utilities. Provide separate site plans for General Construction; Plumbing; Heating, Ventilating, and Air Conditioning; and Electrical Work.
 - .2.1.1 When a site survey has been made by a professional surveyor, a facsimile of the surveyor's drawing must be included with the site plan prepared by the A/E. This survey plan sheet size should be the same as other sheets in the set; if surveyor's drawing is too large, a reduction in scale will be required.
 - .2.1.2 Profiles of proposed utilities and cross sections of the proposed site grades shall be included if applicable.
 - .2.1.3 Hydraulic: A stormwater management calculation package shall be submitted with appropriate sketches and drawings. It shall also include the following items:
 - Signed and sealed stormwater calculations
 - Drainage area map with onsite and offsite areas delineated
 - Major Flood Routing and Ponding Limits Maps
 - Soils map



- Curve number determination, any calculation of composite curve numbers, and appropriate sketches for all proposed storm and/or sanitary sewers.

The stormwater management calculations should meet or exceed the requirement of the City of Columbus Stormwater Drainage Manual, or local municipality stormwater requirements where required.

- .2.1.4 Geotechnical Report and Pavement Design Calculations.
- .2.1.5 Any applicable permit applications, including but not limited to, City of Columbus, ODOT, ODNR, FEMA, and US Army Corp of Engineers
- .2.2 Site landscaping development plan prepared by a Landscape Architect when project includes substantial site work.
 - ADA (details, grading to avoid bird baths, etc.)
- .2.3 All floor plans, showing vertical pipe and duct spaces, structural columns, and principal architectural and engineering features. If sheet size is sufficient, each sheet shall contain a schedule of floor, ceiling, and wall finishes for the floor shown on that sheet. Include Program of Requirements Item Numbers, Room Names and Assigned Room Numbers. Also see 00 00 41.8.
 - BIM model and virtual walkthrough
- .2.4 A roof plan showing all slopes; key reference roofing high point, valley and drain elevations (altitudes referenced to project benchmark); roof drains; penetrations; walkways; large piping; air ducts; fans; condensers; roof structures; equipment screens, ladders, fall protection, lightning protection, green rooftop solar, blue roof considerations, plaza, etc. and sections/details.
- .2.5 Elevation drawings of every exterior side of each structure showing materials, features, openings, floor and roof lines, grade lines, footings and everything exposed to view above eaves or parapets. Visual screening of roof mounted clutter or equipment is required.
- .2.6 Longitudinal and cross sections through the building, selected to best show the relationships or architectural and engineering features.
- .2.7 Equipment and furniture layouts for all floors.
- .2.8 Live loads for floors must be shown on plans.
- .2.9 Fire Protection: Provide current hydrant flow test data and, if applicable, the fire pump sizing and selection data and equipment room layout.
- .2.10 Plumbing system floor plans showing equipment, fixtures, Drain Waste Vent piping, domestic water piping and gas piping (if applicable). Provide design calculations for sanitary, natural gas loads and domestic cold/hot water systems.



.2.11 HVAC system major design calculations.

.2.11.1 HVAC system equipment room locations; showing equipment major piping and ductwork sized for all floors in the building shall be submitted.

.2.11.2 Provide THERMAL STRESS ANALYSIS for the steam and condensate piping systems, as well as campus chilled water piping distribution in accordance with ASME B31.1 Power Piping Design and Fabrication and the OBC Pressure Piping Systems Code. Provide piping isometric diagrams with pipe lengths and node location identifiers shown for cross reference with the calculations. Note all assumed design criteria and pipe material selection, diameter and schedule. Results shall show the different modes of operation: pressure, pressure and temperature, pressure, temperature and weight. Also provide results for cold and hot pipe configurations if needed.

.2.11.3 HVAC heat loss and heat gain calculations for building and/or HVAC system loads: Provide a summary of zone loads, central air handling system loads and hydronic system loads showing a breakdown of internal, envelope and ventilation loads. Note all assumed design criteria.

.2.11.4 HVAC outside air ventilation and minimum supply air quantity calculations for each air handling system to show compliance with ASHRAE Standard 62.1 (edition referenced by Ohio Building Code).

.2.11.5 HVAC schematic one-line flow diagrams for the air systems, hydronic systems, and steam systems.

.2.12 A Database file which compares the assignable square footage (ASF) of the Program of Requirements to that of the Schematic Design Document and the Design Development Document. This submittal must be in the following format:

Title Block

Project Name:

Project Number:

Project total gross square footage (GSF):

Column	Column Header
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1	PoR Item Number
---	-----------------

2	PoR Room Name
---	---------------

3	PoR Priority
---	--------------

4	PoR Number of Rooms
---	---------------------

5	PoR ASF
---	---------

6	Schematic Design Number of Rooms
---	----------------------------------

7	Schematic Design ASF
---	----------------------

8	PoR/Schematic Design ASF Difference
---	-------------------------------------

9	Comments
---	----------

10	Design Development Number of Rooms
----	------------------------------------

11	Design Development Room Number(s)
----	-----------------------------------



12	Design Development ASF
13	PoR/Design Development ASF Difference
14	Comments

This file should also contain a subtotal by Program Item Number Group (e.g., all spaces under Program Item Number 1.0 would be subtotaled). A Project total ASF should also be included (totals from all Program Item # Group ASFs).

- .2.13 Division 18 and Life-Cycle Cost Analysis: Provide updated narrative descriptions of proposed building envelope and HVAC/Electrical/Plumbing system options to show compliance with Division 18. The backup documentation and calculation requirements for these building system options are outlined in Division 18 The life-cycle cost analysis shall be prepared pursuant to Sections 123.001, 153.01, 153.04, and 153.10 of the Revised Code of the State of Ohio and in accordance with rules adopted under Chapters 3781 and 4101.

- .2.14 Electrical submittal shall include:

.2.14.1 Electrical system showing fixtures and equipment.

.2.14.2 Riser diagram indicating connections and wiring to main switch, distribution, power and lighting panels.

.2.14.3 Panel and switch schedule.

.2.14.4 Information regarding clearances between high voltages and low voltage circuits and distances from transformers, other equipment and buildings.

.2.14.5 Electrical system major design calculations and analysis of loads including short circuit calculations, photometric calculations, voltage drop calculations for service entrance, service drop and secondary conductors, demand factors used, calculations determining load availability of existing transformer and capacity to accommodate additional load.

.2.14.6 Fire alarm system riser diagram and function matrix.

.2.14.7 Lighting fixture quantities, including foot candle levels, shall be included. Submit lighting fixture catalog cuts and lamp catalog cuts including lamp life and unit costs per lamp.

Commentary: The University reserves the right to prohibit use of any fixtures, based on lamp life or lamp cost.

- .2.15 Structural engineering calculations to analyze and check the load carrying capacities of various structural members.

- .2.16 Environmental Abatement



- .2.17 BIM deliverable at DD
 - .2.18 Any documents mentioned in 00 00 18.1
 - .2.19 [Design Stage Deliverable Checklist](#)
 - .3 ROOM NUMBER ASSIGNMENTS:
Prior to the completion of the Design Development Phase submit design documents through the e-Builder University Document Submission Review (UDR) Process for room number assignment and signage coordination.
- 00 00 19. CONSTRUCTION DOCUMENT STAGE:**
- .1 SUSTAINABILITY COMPLIANCE PROCESS
 - .1.1 GENERAL –The Sustainability Applicability Matrix ([SAM ≤ \\$75,000 construction budget](#) or [SAM > \\$75,000 construction budget](#)) shall be updated and submitted to the Project Sustainability Stakeholders Group for review and the Project Manager for approval.
 - .1.2 COMMISSIONING & SUSTAINABILITY REVIEW
 - .1.2.1 BUILDING SYSTEMS COMMISSIONING – Prepare Commissioning Report including results of all testing and any adjustments or updates made to construction design documents.
 - .1.2.1.1 Full Cx Plan, review submittals for commissioning system components, and monitor construction and start-up of commissioned systems.
 - .1.2.1.2 Review Pre-functional checklists
 - .1.2.1.3 Site Visits & Reports (Construction)
 - .1.2.1.4 Confirm assumptions and parameters for final energy modeling
 - .1.2.1.5 Commissioning Authority (CxA) to review assumptions, parameters, fixture types, and output used in the WUI calculation.
 - .1.2.2 WATER SYSTEMS COMMISSIONING – Review submittals for flush and flow fixtures for alignment with Design Construction Documents (construction).
 - .1.3 ENERGY
 - .1.3.1 Performance Verification and Benchmarking – A building commissioning and re-commissioning design document is developed during the schematic design step and finalized later in the design process. The



commissioning part of the document shall be used during initial testing and start-up of the building systems.

.1.3.2 A/E shall provide final energy model and anticipated EUI performance following the standards in Division 18.

.1.3.3 If the Project Team or Project Sustainability Stakeholders Group requests a life cycle cost analysis (LCCA) comparison of the updated designed energy systems, the LCCA shall be performed by the A/E and reviewed by the CxA.

.1.4 WATER

.1.4.1 A/E shall provide final project WUI model along with information associated with the reasoning behind updated data inputs. Final Water Use Report shall be provided to the Project Team for review.

.1.4.2 If the Project Team or Project Sustainability Stakeholders Group requests a life cycle cost analysis (LCCA) comparison of the designed water systems, the LCCA shall be performed by the A/E and reviewed by the CxA.

.1.5 MATERIALS

.1.5.1 Construction Manager/Design-Builder Construction Manager/Design-Builder shall update the [Construction Waste Management \(CWM\) Plan](#) to reflect any changes to diverted materials or changes to diversion approach. The Plan will be submitted to Ohio State [Recycling and Refuse Services](#) for review and to the Project Manager for final approval.

.1.5.2 Construction Manager/Design-Builder Construction Manager/Design-Builder shall complete the [Construction and Demolition Tracking spreadsheet](#) as outlined in Division 18. The spreadsheet shall be submitted to Ohio State [Recycling and Refuse Services](#) for review and to the Project Manager for approval.

.1.5.3 A/E shall provide an updated sustainable sourcing calculation utilizing the Sustainability Materials Calculator and following the standards in Division 18. Sustainability Materials Calculator, or affidavit demonstrating compliance with [Prescriptive Materials Matrix](#) (as applicable to project scope) shall then be turned over to the Construction Manager/Design-Builder.

.1.6 ECOSYSTEM –A/E shall update the [Ecosystems Services Assessment](#) based on the design changes.

.1.7 USER EXPERIENCE



- .1.7.1 INDOOR AIR QUALITY (IAQ) – Ventilation – Verify project complies with ASHRAE Standard 62.1, or ASHRAE Standard 170 for Healthcare facilities
- .1.7.2 IAQ – A/E to ensure low-emitting building materials and finishes for main spaces in compliance with Division 18. Documentation of compliance to be provided to the Project Team.
- .1.7.3 IAQ – Pre-Construction / Construction – Construction Manager/Design-Builder shall develop and implement IAQ Management Plan for construction and pre-occupancy in compliance with SMACNA IAQ Guidelines for Occupied Buildings Under Construction *SMACNA IAQ Guidelines for Occupied Buildings Under Construction, 2nd edition ANSI/SMACNA 008-2008*. Include the IAQ Management Plan in the project Schedule.
- .1.7.4 THERMAL COMFORT – A/E to illustrate Predicted Mean Vote (PMV) levels within +/- 0.5; Predicted Percentage of Dissatisfied (PPD) (Defined as the Predicted Percentage of Dissatisfied People Occupying the Space) ≤ 10%. Outputs from [CBE Thermal Comfort Tool](#) are acceptable.
- .1.7.5 THERMAL COMFORT – A/E to illustrate spaces at risk for discomfort (e.g., locations close to entrances prone to drafts or west-facing walls that may retain heat) have been addressed
- .1.7.6 DAYLIGHT ANALYSIS – Determine optimal light levels for the various tasks and activities within the building. Consider height of work plane and age ranges of occupants. A/E shall provide updated evaluation simulation output report of daylight levels to ensure project follows section 18 60 60.
- .1.8 SUSTAINABILITY WORKSHOP – For each qualifying building construction and renovation project with a total project budget at or above the Board of Trustees Authorization threshold (\$4 million), the A/E shall schedule a Sustainability Workshop meeting with the Project Team and the Project Sustainability Stakeholders Group at 50% CDs (GC/DB projects) or GMP Documents (CMR projects). The purpose of this workshop is to revisit Sustainability Goals, and for the design team to report progress to the Project Sustainability Stakeholders Group.
- .2 SUBMITTAL: The expectation for the Construction Document (CD) phase submittal is for the University to receive Drawings and a Project Manual that are 100% complete and ready to be issued for bidding. The submittal shall consist of:
 - .2.1 Complete drawing set
 - .2.2 Project manual



.2.3 CODE INFORMATION: On the title sheet of the drawings and on the title page of the Project Manuals, show the Ohio Building Code (OBC) "updated through" date that was used for design, use group classification, type of construction classification and the area of each floor.

.2.4 A Database file which compares the assignable square footage (ASF) of the program of requirements to that of the Schematic Design Document, the Design Development Document, and the Construction Document. This submittal must be in the following form at:

Title Block

Project Name:

Project Number:

Project total gross square footage (GSF):

Column Column Header

1 PoR Item Number

2 PoR Room Name

3 PoR Priority

4 PoR Number of Rooms

5 PoR ASF

6 Schematic Design Number of Rooms

7 Schematic Design ASF

8 PoR/Schematic Design ASF Difference

9 Comments

10 Design Development Number of Rooms

11 Design Development Room Number(s)

12 Design Development ASF

13 PoR/Design Development ASF Difference

14 Comments

15 Construction Document Number of Rooms

16 Construction Document Room Number(s)

17 Construction Document ASF

18 PoR/Construction Document ASF Difference

19 Comments

This file should also contain a subtotal by Program Item Number Group (e.g. all spaces under Program Item Number 1.0 would be subtotaled). A Project total ASF should also be included (totals from all Program Item # Group ASFs).

.2.5 RENDERINGS, as required by the A/E's contract.

.2.6 A physical or electronically generated MODEL shall be submitted at this stage, if required by the A/E's contract.

.2.7 Electronic Submittal OF CIVIL, STRUCTURAL, HVAC, PLUMBING, FIRE PROTECTION AND ELECTRICAL DESIGN CALCULATIONS shall be furnished to assist University personnel in review of the documents. As a minimum, this should include the final updated calculations of all calculations required in the



Design Development submittal, including the finalized THERMAL STRESS ANALYSIS modeling.

- .2.8 An updated detailed quantity estimate of cost showing final square foot and all material quantities shall be submitted in both hardcopy and electronic format (Microsoft Excel). All labor, material, and equipment should be broken out separately.
- .2.9 Provide final HVAC schematic one-line flow diagrams for the air systems, hydronic systems and steam systems. Provide backup calculations for these building envelope and system configurations.
- .2.10 Any documents mentioned in 00 00 19.1.
- .2.11 [Design Stage Deliverable Checklist](#)

00 00 20 CONSTRUCTION STAGE

.1 SUSTAINABILITY COMPLIANCE PROCESS

- .1.1 GENERAL – The Sustainability Applicability Matrix ([SAM ≤ \\$75,000 construction budget](#) or [SAM > \\$75,000 construction budget](#)) shall be updated and submitted by the A/E team to the Project Sustainability Stakeholders Group for review and the Project Manager for approval.
- .1.2 COMMISSIONING & SUSTAINABILITY REVIEW
 - .1.2.1 COMMISSIONING PLAN - Site Visit & Reports (Construction) and coordinate and document Functional Performance Testing (Substantial Completion)
- .1.3 ENERGY – A/E shall perform a life cycle cost analysis (LCCA) for Total Cost of Ownership of the designed energy systems. The LCCA shall be reviewed by the CxA.
- .1.4 WATER – A/E shall perform a life cycle cost analysis (LCCA) for Total Cost of Ownership of the designed water systems. The LCCA shall be reviewed by the CxA.
- .1.5 MATERIALS – Construction Manager/Design-Builder shall complete the [Construction and Demolition Tracking spreadsheet](#) as outlined in Division 18. The spreadsheet shall be submitted to Ohio State [Recycling and Refuse Services](#) for review and to the Project Manager for approval. Construction Manager/Design-Builder shall also complete the Sustainable Materials Calculator or provide affidavit demonstrating compliance with Prescriptive Materials Matrix, as applicable to project scope.



.1.5.1 Construction Manager/Design-Builder shall submit the Sustainable Materials Calculator and following the standards in Division 18.

.1.5.1.1 Preliminary calculator shall be developed showing agreed upon buy-out targets.

.1.5.1.2 Final calculator shall be developed using as built information.

.1.6 ECOSYSTEM –A/E shall update the [Ecosystems Services Assessment](#) based on the design changes during construction.

.1.7 USER EXPERIENCE

.1.7.1 DAYLIGHT ANALYSIS – if necessary, A/E shall provide updated evaluation of daylight levels to ensure project follows section 18 60 60.

.1.7.2 LIGHTING PLAN – if necessary, A/E shall provide updated Lighting Plan and design narrative.

.1.7.3 IAQ – Pre-Occupancy – After finishes and furnishings installed, perform building flush out, as recommended by IAQ Testing Authority. Perform IAQ test; CxA to verify that minimum ventilation rates are within -5% to +10% of minimum design values through testing and balancing.

.1.8 CONSTRUCTION KICKOFF FOR SUSTAINABILITY –For each qualifying building construction project with a total project budget at or above the Board of Trustees Authorization threshold (\$4 million), the A/E shall schedule a Sustainability meeting with the Project Team, the Project Sustainability Stakeholders Group, and the Construction Manager/Design-Builder. The purpose of this workshop is to introduce the project Sustainability Goals to the Construction Manager/Design-Builder, and map out process for achieving sustainability requirements relative to the construction process. The meeting will identify all topics related to Division 18 which shall be discussed in the weekly Owner-Architect-Contractor (OAC) meetings.

.2 SUBMITTALS:

.2.1 Any documents mentioned in 00 00 20.1.

00 00 21 POST CONSTRUCTION / BUILDING PERFORMANCE STAGE:

.1 SUSTAINABILITY COMPLIANCE PROCESS

.1.1 GENERAL – If changes have occurred to the project budget or scope, the Sustainability Applicability Matrix ([SAM ≤ \\$75,000 construction budget](#) or [SAM > \\$75,000 construction budget](#)) shall be updated and submitted to the Project Sustainability Stakeholders Group for review and the Project Manager for approval.



.1.2 COMMISSIONING & SUSTAINABILITY REVIEW

- .1.2.1 COMMISSIONING PLAN – Issue Final Cx Report (Operation). Perform second season site visit 10 months after substantial completion prior to expiration of equipment and systems warranty (Operation).
- .1.2.2 MONITORING-BASED SYSTEMS COMMISSIONING – evaluate energy and water use and identify possible malfunctions or items that could be altered to improve energy / water efficiency
- .1.2.3 BECxA – Building Enclosure Warranty Compliance Report. Conduct training of owner in operation and maintenance of the building enclosure and inter-related systems BECxA shall witness and document the system provider’s training of the owner in operation and maintenance of the performance of the building enclosure materials, components and assemblies prior to the conclusion of the initial warranty period 10 months after substantial completion.

.1.3 ENERGY

- .1.3.1 Calibration of Energy Model: After one year of full building occupancy and upon having 12 months of utility data, the university shall review the results of the building’s actual Energy Use Intensity (EUI). If the building actual EUI is 10% above the approved design Site EUI Target, the original A/E shall be responsible for calibrating the final design energy model based on information provided by the university on actual building performance and use. The calibrated model shall be normalized and weather adjusted following the standards outlined in Divisions 18 30 50. The calibrated model shall be compared to the final design model and design Site EUI Target, and the differences shall be identified. The A/E shall summarize the causes for the differences (such as occupancy, weather and modeling tool accuracy) and make improvement recommendations; the CxA shall confirm the updated model. The Project Team and Project Sustainability Stakeholders Group shall collaborate to evaluate the findings, the recommended improvements, and ultimately on a plan to implement improvements if necessary. Information to be acquired through the university shall include, but not be limited to, as follows:

- .1.3.1.1 Energy Use (all metered utilities)
- .1.3.1.2 Building and HVAC equipment operation schedules
- .1.3.1.3 Building Automation System trend data for main HVAC systems (i.e. flow rates, supply/return temperatures, pressures, etc.). Contact FOD Building Automation Shop for Kaizen Building Analytics information.



.1.1.3.4 Building programming changes

.1.1.3.5 Building population data

.1.4 SUSTAINABILITY DEBRIEF – One month post construction the Project Sustainability Stakeholders Group, Project Manager, A/E Team, and Construction Manager/Design-Builder shall host a one-hour sustainability “debrief” conference. Purpose of the meeting will be to informally share project successes and lessons learned, and collect input from the team on the process.

.2 SUBMITTALS

.2.1 Any documents mentioned in 00 00 21.1.

00 00 30. DESIGN QUALITY:

00 00 31. UNIVERSITY ARCHITECT’S INVOLVEMENT AND UNIVERSITY REVIEW IN THE DESIGN PROCESS:

The A/E is required to involve the University Architect in the entire design process. The University Architect is as interested in the response to the Conceptual Design Guidelines as the solution of the specific problem needs stated in the Program of Requirement. It is especially important that the A/E understand the high priority that the University places upon the role of each facility in the creation of the overall campus. No building will be permitted to be designed in isolation. All buildings contribute to the achievement of overall University goals and, as a result, they will be different from buildings designed for other sectors of our society.

The A/E is expected to confer with the University Architect often, especially during the early conceptual design phase. Submission of a detailed, final, schematic design without prior review may result in rejection of the entire preliminary submittal and require complete redesign. The University Architect shall be the final design jurist.

.1 Review of A/E document submittal will require approximately ten workdays or more, depending upon the complexity of the project and quantity of documents.

During the review interval, any changes required by Facilities Operations and Development, the Industrial Compliance Division, or other State Agencies, must be made, preferably not by Addenda.

.2 REVIEW COMMENTS: At the time of, or prior to, issuance of the last Addendum during the bidding period, the A/E shall advise the University Project Manager in writing that all comments, changes, etc., resulting from document review by the Industrial Compliance Division, Fire Marshal, University, and other agencies having review authority, have been incorporated into the construction contract documents. In the case of the exceptions, the A/E must indicate date, meeting, item, etc. involved in the resolution. Following receipt and approval of the responses to the review comments, the A/E shall



submit an electronic copy of the revised documents for review by Facilities Design and Construction.

00 00 32. QUALITY DESIGN:

Unless otherwise stated in the POR, buildings shall be designed as quality institutional buildings and heavy-duty components shall be selected and specified to provide maximum life cycle usefulness. The requirement that the project be designed within available funds is not a license to design short life-cycle, speculative-type construction or to specify inferior or inappropriate materials.

00 00 33. USE OF PROFESSIONAL CONSULTANTS:

On all architectural and engineering projects for which enclosed structures are designed, the services of licensed professional architects and engineers are always required for the Architectural, Structural, Civil, Plumbing, HVAC, Fire Protection, and Electrical design. Sprinkler consultant must be capable of hydraulic design. On major projects, the services of other licensed professional specialists (Landscape, Acoustic, Food Service, etc.) might be required, as determined by the complexity of the project. The A/E shall closely supervise work done by their consultant, whether "in-house" or independent, to assure coordination of all parts of the total project. The University Architect reserves the right to direct the work of professionals through the A/E.

- .1 TOPOGRAPHIC SURVEYS AND SOILS ANALYSIS REPORTS: Is the responsibility of the A/E to accomplish. Costs of these services will be paid from the Project funds on an actual cost basis without fee mark-up. Any available record drawings from previous projects or the Utility Atlas maintained by Facilities Operations and Development will be made available. The University cannot warrant that information shown on record drawings is correct; therefore, the A/E must supplement this information with field surveys and measurements. The A/E is responsible for the accuracy of information shown on the contract drawings. See Appendix E for survey requirements.

00 00 34. NOT USED**00 00 35. NOISE AND VIBRATION CONTROL:**

Noise and vibration in terms of emission control and transmission control is the combined responsibility of the A/E and its consultants and must be considered in the design of every building, or space, even though specific requirements might not be stated in the POR. Three principal considerations which must be given to noise and vibration control are:

- .1 NOISE CONTROL TO PROVIDE FOR MAXIMUM USEFULNESS OF THE FACILITY by keeping levels of sound within ranges which are conducive to study and work or other uses for which the facility is designed.
- .2 NOISE CONTROL IN COMPLIANCE WITH OSHA REQUIREMENTS for the health and safety of building occupants; control shall be for all areas of the facility, including



- equipment rooms, boiler rooms, PRV stations, and fan rooms. Set a maximum acceptance level of 85 dBA for new equipment.
- .3 VIBRATION CONTROL to limit sound produced by equipment and for protection of the equipment and the building structure.
 - .4 RANGES OF SOUND CONTROL LIMITS required for indoor design are shown in the Appendix J. These standards must be followed.
 - .4.1 CONTROL OF BUILDING EQUIPMENT (HVAC, ELECTRICAL, ETC.): Special attention shall be given to proximity by keeping noise producing equipment removed as far as possible from areas requiring low sound levels. Refer to Division 22, 23, and 26 for specific means of reducing noises from these sources.
 - .5 TESTS: A post-construction sound test shall be specified to prove the integrity of sound control where control is critical, and on a random sampling basis in other areas if deemed necessary. Specifications shall require that noise tests to be performed with a Type 1 precision sound level meter complying with ANSI - Standard S1.4-1983.

00 00 36. PLANNING FOR SERVICE AREAS:

- Required, but not necessarily identified in the program. All service rooms or areas (i.e., custodial closets, trash rooms, maintenance control rooms, equipment rooms, mail rooms, etc.) shall be adequately ventilated, by natural or mechanical means (especially if human occupancy is required), the A/E shall work with appropriate stakeholders to ensure that the following areas are properly incorporated into the design:
- .1 CUSTODIAL SPACES: For new buildings on the Columbus Campus, provide the following custodial spaces; for regional campuses, consult the Director of Building Services at the campus involved; requirements might differ from those specified herein.
 - .1.1 CUSTODIAL EQUIPMENT STORAGE ROOM: shall be strategically located on all floors throughout the building for the storage of custodial cleaning equipment. Minimum size of 55 gross square feet (GSF) is required. Provide one room per 22,000 gross square feet. One room can serve two floors, if 22,000 square feet is the limit and an elevator is convenient to the closet. Locate to avoid moving equipment long distances. Typical equipment and sizes are, but not limited to:
 - .1.1.1 Mopping cart: 2 feet x 6 feet
 - .1.1.2 Trash cart (6 bushel): 2 feet x 3 feet
 - .1.1.3 Vacuum, carpet (upright): 2 feet x 1 foot
 - .1.1.4 Backpack Vacuum: 3feet x 4 feet
 - .1.1.5 Floor machine (buffer) – 2 feet x 4 feet or larger
 - .1.2 CUSTODIAL WET CLOSET: Provide one strategically located room per 22,000 gross square feet and at least one room per floor. These closets may be combined with custodial equipment storage rooms. Each closet shall be equipped with a floor sink, shelving, and mop holders. Each closet to be



Minimum size of 60 gross square feet and shall contain the following, but not limited to:

- .1.2.1 Mop sinks shall be commercial precast terrazzo or molded stone with floor-mounted sink basin and drop-front styling with stainless steel cap and maximum curb height of 4 inches. Shall also include integral stainless steel floor drain assembly and strainer plate with two-sided stainless steel splash catcher/wall guard panels. See the link for additional information on mop sinks https://fod.osu.edu/sites/default/files/div_22.pdf
- .1.2.2 Hot and cold wall-mounted service-type Bibb faucet with 6-inch spout centered over floor-mounted mop sink basin with isolation ball valves and integral vacuum breaker, heavy-duty mop bucket hangers (wall clips) and a minimum hose length of 4 feet.
- .1.2.3 Three or more dry mop and dust mop hooks or clips installed 6 feet above finish floor on wall away from floor-mounted mop sink basin.
- .1.2.4 Three or more wet mop hooks or clips installed 6 feet above finish floor on wall away from floor-mounted mop sink basin.
- .1.2.5 Pad/brush holder.
- .1.2.6 Step ladder – 1 foot x 2 feet
- .1.2.7 Vacuum, (wet or dry): 3 feet x 4 feet with wall space and wall-mounts for OSI-compliant backpack vacuums.
- .1.2.8 Shelving – 1 foot deep, and at least 15 lineal feet of adjustable shelving with bottom shelf at least 4 inches off finish floor.
- .1.2.9 Minimum of 2 duplex GFI electrical outlets located approximately 2 feet above finish floor on wall(s) away from the water supply.
- .1.3 CUSTODIAL RECEIVING AND STORAGE ROOM near a loading dock, or near an elevator on the lowest floor for bulk storage of custodial supplies, may require limited shelving. The room shall be at least 80 gross square feet to serve a building size up to 45,000 gross square feet, 100 square feet to serve a building over 45,000 gross square feet up to 130,000 gross square feet, and 140 gross square feet to serve a building having over 130,000 gross square feet.
- .1.4 DRY TRASH ROOM shall open directly onto a loading dock, and to an inside corridor. Hot water, cold water, and floor drains shall be provided in each trash room which serves a kitchen facility. Trash rooms shall be of fireproof construction and protected with sprinklers. The room shall have a minimum size of 100 gross square feet to serve a building size up to 45,000 gross square feet, 120 gross square feet to serve a building over 45,000 square feet up to 130,000



gross square feet, and 160 gross square feet to serve a building having over 130,000 gross square feet.

- .1.5 WET WASTE OR HAZARDOUS WASTE ROOM of 60 gross square feet minimum must be provided for chemistry or similar laboratory facilities. If required by the building usage, the room shall be located directly off the loading dock and from a corridor. The door to the wet waste or hazardous waste room shall be outward swinging. The room shall be fireproof and provide other protection as determined by the nature of the waste material.
- .1.6 ADDITIONAL REQUIREMENTS for custodial spaces are as follows:
 - .1.6.1 Doors shall swing out into the corridor with no automatic closure devices, and shall be at least 36 inches wide (40 inches is preferable) to permit the free movement of custodial carts, cleaning machines and janitorial equipment.
 - .1.6.2 Custodial Wet Closets shall have exposed concrete or painted drywall ceiling, hardened smooth concrete floor, and washable hard smooth finish on concrete block walls. Provide glazed tile walls at floor-mounted mop sink basin.
 - .1.6.3 Finishes in other custodial spaces shall be similar to those for Custodial Wet Closets.
 - .1.6.4 Provide ventilation and negative air pressure that includes separate outside exhausting and no air recirculation, designed to achieve an exhaust rate of 1 CFM/SF and a minimum of 5 Pa when the doors are closed and 1 Pa when the doors are open.
 - .1.6.5 Lighting shall be a minimum of 75 footcandles, mounted flush in ceiling, and shall be controlled by Occupancy Sensors which utilize a 180 degree field of view.
 - .1.6.6 No Custodial rooms shall contain telephone switchgear, elevator panels, electric panels, metering devices or similar equipment.
- .1.7 FACILITIES MAINTENANCE CONTROL ROOM: The location of the control room shall be determined with input from all appropriate stakeholders. The minimum size of the room shall be 80 square feet to serve a building size up to 80,000 gross square feet, 100 square feet to serve a building over 80,000 square feet up to 175,000 gross square feet, and 160 square feet to serve a building having over 175,000 gross square feet.
 - .1.7.1 CONTENTS of the room shall include at least the following:
 - .1.7.1.1 Plan rack to hold a full set of record drawings.



.3.2.2 Rooms with electrical switchgear, panels, substations shall have outward swinging doors.

.3.3 ACCESS TO EXISTING, NEW, OR TEMPORARY UTILITY CONTROL DEVICES, valves, switches, manholes, etc. shall be maintained throughout the course of construction.

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- .4 PIPE SPACES: Pipe spaces shall be of width required for servicing of piping, but minimum clear width shall be 2-feet 0-inches. Provide access doors with lockset that can accommodate a small format interchangeable core (SFIC). When in exposed locations, access doors and hardware shall be designed to match doors and hardware for adjacent areas.
- .5 SERVICE SPACE ACCESS: Access to any service space shall be provided to the appropriate service provider (i.e. Facilities Operations and Development, Medical Center Operations, regional campus facility maintenance provider, etc.)

00 00 37. FURNITURE, FIXTURES AND EQUIPMENT (FF&E):

- .1 SUSTAINABILITY: The University promotes energy efficient green design, construction and building operations. Where possible, FF&E are to be selected and specified following Division 18.
- .2 DESIGNS: The process of planning, design, specification and installation of FF&E is an integral part of the planning, design and construction of a project. The A/E and their team of specialists, including professional interior design services, shall be responsible for the planning, design and specification of all FF&E that is associated with a project. The University Project Manager will be responsible for directing and coordinating interior design services by the A/E.

The A/E shall provide ample seating (construction or fixed equipment) as part of the architectural design for corridors, lobbies and other areas immediately outside classrooms and other areas of assembly.

The A/E shall not design custom construction or millwork in places where there is a probability for equipment or function change as it increases future University costs for these changes. The A/E shall instead use flexible FF&E. Typical proposed substitutions are desks, counters and other office equipment areas. All proposals for custom construction or millwork are to be reviewed and approved by the University Architect prior to final development of the Construction Documents.

- .3 CATEGORIES: FF&E is categorized as Fixed Equipment or Movable Equipment. Refer to Division 10 SPECIALTIES, Division 11 EQUIPMENT and Division 12 FURNISHINGS for details.



.3.1 **FIXED EQUIPMENT** is generally defined as any manufactured product that is attached or requires significant structural or construction coordination in a building. Fixed Equipment is acquired through one or more of the construction contracts and is funded within the project construction budget. In some cases, the University may choose to purchase Fixed Equipment for a project. In these cases, the cost of the equipment is moved from Construction funds to Equipment funds for purchase. The Construction Documents must include all services and construction coordination for the installation of this equipment.

.3.2 **MOVABLE EQUIPMENT** is generally defined as any smaller, loose products that are acquired by the University. Movable Equipment purchases utilize a fund allocation within the total project funds but independent of the construction budget. Using specifications developed by the A/E, the University will procure movable equipment by means of a bid process or by using pre-bid University or State contracts.

.3.2.1 **TECHNOLOGY EQUIPMENT:** Technology equipment is a sub-category of the Movable Equipment noted above. The cost of technology planning, design and specification for classrooms, auditoriums, and department classroom meeting space is also included in this budget. The University Project Manager will contract and oversee the technology design process.

The timing for technology design must coincide with the development of Construction Documents and prior to bidding. The A/E must be involved in this design as they are responsible for the coordination of all services, structural support, blocking, riser diagrams, power, data locations and required HVAC needs for the Equipment.

Typically, movable equipment funding allocations are provided for new building construction projects but not for remodeling/renovation projects.

00 00 38. MISCELLANEOUS DESIGN REQUIREMENTS:

The following requirements are of a general nature and do not fit into any particular CSI division. Requirements pertaining to particular materials or work are given in the appropriate CSI divisions 01 through 48 of this Building Design Standard.

- .1 **TEMPORARY EGRESS:** Building addition and expansion projects which involve eliminating or closing an existing required means of egress shall be provided with a temporary means of egress accessible to individuals with disabilities. Ohio State's Public Safety must review and approve any suggested temporary egress concepts.
- .2 **NOT USED**
- .3 **STRUCTURAL DESIGN REQUIREMENTS**
 - a. **FLOOR LOADS:** Minimum design floor live loads shall be at least 100 pounds per square foot.



- i. Identify floor live loads for each room or space on each floor plan drawing.

b. ROOF LOADS:

For unheated storage facilities or barns: Design dead loads shall accommodate and identify allowances for future ceiling and insulation and a concurrent 200# point load allowance for future suspended equipment (at truss bottom chords where applicable).

- .4 LINES OF SIGHT INTO TOILETS shall positively be broken. Location of mirrors and reflected images shall be checked by the A/E. Direct or reflected sight lines into dressing rooms or toilets are prohibited.

- .5 CORRIDOR DOORS: Doors on opposite sides of corridors shall be offset to prevent direct view from one room to another. Classroom and laboratory room doors opening into corridors shall be recessed the width of the door to eliminate corridor obstructions.

- .6 RECESSES shall be provided for drinking fountains. The recesses shall be finished with glazed structural tile, ceramic tile, glazed concrete block, or concrete block finished with a paint which will withstand repeated scrubblings.

- .7 EXTERIOR DOORS, except those designed with hardware for emergency exit only, shall be protected by canopies and wing walls; or doors shall be recessed.

- .8 HVAC IN REMODELING PROJECTS: Spaces between floor construction and suspended ceilings shall not be crowded with equipment of such size that the equipment cannot be serviced and effectively insulated for noise control. In lieu of such installations, properly insulated floor spaces, of a size which will accommodate equipment, shall be provided.

- .9 CONNECTION TO EXISTING UTILITIES: Refer to FACILITY SERVICES, Section 3, for instructions regarding design and installation of both temporary and permanent connections to existing utilities (i.e., steam, condensate return, heating hot water supply and return, chilled water supply and return, domestic hot water, gas, cold water, alarm systems, emergency electric, electric, etc.) Also see 01 51 00 and 33 00 00.

- .9.1 CONNECTIONS TO CITY OF COLUMBUS UTILITIES: In the university's campus peripheral areas where connections are being made directly to City of Columbus Utility Division water and sewer mains all City utility rules and ordinances shall apply. Expect system capacity charges, which are based on water line sizes, for domestic water, fire service lines, and sanitary sewer connections. Expect to have to run separate domestic water and fire suppression lines from the public right-of-way to the building. In addition there will be tap (inspection) fees and meter charges. If a building has been demolished on the site, credits will be applied based on the size of the previous services. The A/E shall as a part of the design process deal directly with the City Division of Water and Division of Sewerage and Drainage, presenting for their approval site utility drawings. Allow a number of weeks for this process. (Start as early as possible and don't expect special treatment for University projects). Any documents shared and/or approved by the City of Columbus shall be provided to the University Engineer. Construction Documents must make clear to the bidders



what City fees and charges to anticipate as some of these charges may be significant.

Before stormwater management plans are finalized for site drainage, including roof drains, the Stormwater Office of the City of Columbus Division of Sewerage and Drainage must approve them. Any approval documents from the City of Columbus shall be provided to the University Engineer. Flow control measures may be required. Meeting the requirements of the City may have unexpected financial impact so contact with the Stormwater Office must be made during the design development process.

- .9.2 CONNECTIONS TO UNIVERSITY WATER DISTRIBUTION SYSTEM: The Ohio State University master meters water from the City of Columbus Utilities Division Department. All City system capacity charges for water and sewer service have been satisfied for connections to the University water system. All the City requires, for record purposes, is a utility site plan showing water and sewer connections. This site plan shall be submitted to Ohio State's Facilities Operations and Development; and Water Resources Engineer in Facilities Operation and Development Energy Services and Sustainability Office at the bid document stage. The Water Resource Engineer, or representative, will inspect both water and sewer taps. All water outages should be coordinated a minimum of 14 days prior with the University's Facilities Operation and Development MEP Office.
- .10 ROOF-MOUNTED EQUIPMENT: Pitch pans or pitch pockets are prohibited.
- .11 ROOF STRUCTURES AND ROOFTOP EQUIPMENT SCREENS: Finish materials and colors are subject to the approval of the University Architect.
- .12 WOMEN'S TOILET ROOMS: _
Comply with the OBC plumbing fixture requirements for water closets and lavatories for women and men. Buildings that have a larger population of women to men provide additional water closets and lavatories for women to meet the populations need. Confirm this with the University Architect prior to schematic document review.
- .13 LACTATION/WELLNESS ROOMS: All new and major renovated buildings will include at least one lactation room. Each facility will include enough area to accommodate appropriate furniture (e.g. a lounge chair with tablet), counter space with sink, microwave, power and data outlets, coat rack/hooks, goose neck type faucet, sink deep enough to wash bottles and pump parts, paper towel dispenser, trash can, soap dispenser, full length mirror, bulletin board, walls minimum STC 45 sound rating, electrical outlet above work surface for pump and accessories, clear knee space beneath the desk height table/counter, and a Schlage L Series mortise indicator lock part # L9440 06N L283-722. Mortise indicator lock option from Best 45H 7L 15J 626 (Handing) VIB.



- .14 EMPLOYEE TOILET ROOMS: It is University policy to avoid providing separate toilet rooms for students and employees.
- .15 FAMILY OR ASSISTED-USE RESTROOM: Provide one family or assisted-use restroom (~~gender-inclusive~~) in all new buildings, and, when feasible, existing buildings. Room size shall meet ADA requirements with provisions for one water closet, one lavatory, diaper changing station, and a Schlage L Series mortise indicator lock part # L9440 06N L283-722. Mortise indicator lock option from Best 45H 7L 15J 626 (Handing) VIB. The location should be adjacent to either entrance or elevator lobby on the ground floor.
- .16 PROVISION FOR ADDITIONAL FLOORS: All structures must be designed to accommodate the addition of two floors in the future unless this requirement is waived by The University Architect. Notations on the structural and foundation drawings must show allowable future loadings.
- .17 University facilities are intended to last as long as the university. Therefore, buildings and structures should be designed last beyond 100 years.
- .17.1 Some facilities, such as barns and other temporary structures, are not required to be designed to last beyond 100 years. However, the A/E shall ensure that the structure will last its intended/design life span.
- .18 LOUVERS for air distribution systems shall be specified in Division 23, door louvers in Division 8, all others in Division 10.
https://fod.osu.edu/sites/default/files/div_23.pdf
<https://fod.osu.edu/sites/default/files/division08>
https://fod.osu.edu/sites/default/files/div_10.pdf
- .19 Deleted.
- .20 WARRANTIES, OPERATION AND MAINTENANCE MANUALS: Within 60 days after (Temporary or Permanent/Final) Certificate of Occupancy, submit warranties, instruction sheets, catalog data, and final shop drawings electronically following the eBuilder requirements. Provide full information (trim sheets and log sheets) defining all conditions, quantities of refrigerant, pressures, temperatures, etc. during the testing operations of each piece of equipment.
- .21 INFILTRATION: Shall meet or exceed the code requirements of the Ohio Building Code. Compliance with overall air leakage requirement shall be determined by calculations using certified data furnished by the manufacturers or suppliers of doors, windows, and wall materials supplemented by calculations using the crack method given in the ASHRAE Handbook of Fundamentals at the appropriate prevailing design wind conditions for the area of application.
- .22 RESTRICTED LOCATION: Operating equipment other than sump pumps shall not be located below the published 500-year FEMA flood plain elevation for hydraulically connected facilities.



Commentary: “hydraulically connected” is intended to mean facilities that are connected to other building/facilities or the Olentangy River by tunnels, drain pipes, conduit, etc.

.23 HAND DRYERS: Moved to 10 28 13.13.9.

00 00 40. PREPARATION OF DOCUMENTS

.1 DIGITAL FILE BOOKMARKING REQUIREMENTS:

The intention of The Ohio State University’s digital file bookmarking requirements is to create digital files that are consistently organized and easy to use for all project stakeholders during design, construction, and building operation. These bookmarking requirements apply to all multi-page digital (PDF) drawing, specification, narrative and other similar multi-page submissions created by an A/E, Commissioning Agent, Construction Manager/Design-Builder, or other party providing such submissions. These requirements apply to all phases of projects, beginning with Programming through Closeout. Please note, failure to follow these requirements will result in the University not accepting the submission.

.1.1 Drawing Sets

Drawing submissions shall include a combined PDF file (one multi-page file per bid package, phase, or volume) containing the cover page and all drawings in the same order as listed on the drawing index. Each drawing shall have a bookmark, named to match the drawing sheet number and name. A sample format has been provided below:

(Discipline Code) (Drawing Number) – (Drawing Name)

Ex: G000 – Cover Page

A101 – First Floor Architectural Plan

A102 – Second Floor Architectural Plan

H101 – First Floor HVAC Plan

.1.2 Specification Manuals

Specification submissions shall include a combined PDF file (one multi-page file per bid package, phase, or volume) containing the cover page and all specifications in the same order as listed on the table of contents. Each specification section shall have a bookmark, named to match the six-digit CSI section number and name. A sample format has been provided below:



(6-Digit CSI Code) – (Section Name)

Ex: 033000 – *Cast-in-Place Concrete*
 042113 – *Brick Masonry*
 055000 – *Miscellaneous Metals*
 080000 – *Glazing*

.1.3 Narratives & Other Miscellaneous Multi-Page Documents

Narratives and other similar multi-page supplemental design and construction documents shall include a combined PDF file, containing the cover page and all sections in the same order as listed on the table of contents. Each section shall have a bookmark, named to match the section title. A sample format has been provided below:

(Section Number) – (Section Name)

Ex: 1 – *Executive Summary*
 2 – *Architectural and Engineering Design Intent Narrative*
 3 – *Life Cycle Cost Analysis*

00 00 41. DRAWINGS AND PROJECT MANUAL:

Shall be prepared in conformance with Section 153.50 and 153.52 of the Ohio Revised Code. The Ohio State University requires separate documents to be prepared for each of the following: General; Plumbing; HVAC (Heating, Ventilating, and Air Conditioning); Fire Protection; and Electrical. [Documents may be combined when permitted by Ohio law and approved by the University Engineer.]

As a flagship institution, The Ohio State University recognizes its responsibility to provide sustainability leadership by adopting business practices that reduces energy consumption. Therefore Division 18 has been developed and shall be incorporated into the building process as applicable.

Drawings and Project Manual documents shall follow all applicable guidelines as referenced in the Electronic Drawing Naming Requirements:

https://fod.osu.edu/sites/default/files/electronic_drawing_naming_req.doc available on the Project Delivery Website:

The A/E is required to submit a completed Design Review Acceptance form, available on the Project Delivery Website:

https://fod.osu.edu/sites/default/files/0200_design_review_acceptance.doc for every phase of the project.



- .1 MATERIALS: Schematic design and design development sketches and drawings shall be submitted electronically for review
- .2 SHEET SIZES: The 36 by 24 inch size is preferred. Authorization must be obtained from the University Architect for use of other sheet sizes.
- .3 TITLE SHEETS, properly identified as to which submittal is being made, shall be provided on each submittal of drawings. The project numbers assigned by the university shall appear on title sheets. See 00 00 19.2.3 for code information to be included on the drawing cover sheet. Obtain sample sheet from the University Project Manager. See <https://fod.osu.edu/resources> under Professional Services for example of desired Title Sheet.
- .4 TITLE SHEET AND TITLE BLOCK STANDARD DRAWINGS: These Title Sheet and Title Block standard drawings are to be utilized on all projects for Facilities Operations and Development. See <https://fod.osu.edu/resources> under Professional Services for examples.
- .5 TITLE BLOCKS shall be drawn in the lower right-hand corner of each drawing sheet. The project number, assigned by the University, in addition to the A/E's job number, shall appear in the title blocks. See <https://fod.osu.edu/resources> under Professional Services for an example.
- .6 SHEET NUMBERS: Use A (Architectural), C (Civil), S (Structural), HM, (Hazardous Material), L (Landscape), T, (Technology), P (Plumbing), H (HVAC), F (Fire Suppression), E (Electrical), etc. Do not use "M" (Mechanical) for Plumbing, HVAC, or Fire Protection.
- .7 DRAWINGS FOR REMODELING PROJECTS: Two drawings of each floor plan are required: One drawing is to show existing construction and demolition; the second is to show the new construction and existing construction which is to remain. When sheet size permits, the two plans shall be drawn on the same sheet, for easy comparison of the two. This requirement applies to the floor plans for all submittals and all divisions of the work. Show existing room numbers on the demolition drawings.
- .8 BUILDING INFORMATION MODELING (BIM)
 - .8.1 The Architect/Engineer (A/E), or Construction Manager/Design-Builder shall meet, for projects four million dollars or greater, the BIM Project Delivery Standards (BIM PDS)
 - .8.2 Project Delivery Standards http://fod.osu.edu/sites/default/files/documents/ohio-state_bim_pds.pdf
 - .8.3 Execution Plan http://fod.osu.edu/sites/default/files/documents/ohio-state_bim_ep.docx



~~.8.4 Video Training – #2 Project Delivery Standards
<http://www.youtube.com/watch?v=BQJwL8wp2Hw>~~

00 00 42. PROJECT MANUAL:

- .1 PRINTING AND BINDING: The A/E is advised to run only the number of copies required for review purposes. SETS FOR BIDDING PURPOSES SHOULD BE MADE ONLY AFTER ALL REVIEW CORRECTIONS HAVE BEEN MADE. Generally, follow instructions in the Ohio Facilities Construction Manual.
 - .1.1 COVER SHEETS
 - .1.1.1 The A/E will furnish sample printed front covers for the construction document Project Manual. The cover shall include all required titles, names, information and shall provide matching back covers of the same size paper quality and color as the front cover samples. In binding the finished books, both front and back covers shall be doubled at the binding edge and folded over screw-post type fasteners.
 - .1.2 BINDERS: Screw-type binding posts are required. For construction document submittals, any binder used must be covered as indicated above. Roll-form plastic binders and ACCO clips are prohibited. Submittals for schematic design and design development phases shall be made electronically.
- .2 OUTLINE PROJECT MANUAL: Submit outline of Division 00 and the specifications with schematic drawings; update this Project Manual for submission with design development drawings.
 - .2.1 Outline specifications are among the most important documents to be submitted. It is by these specifications that the University Planning Committee determines the acceptability of material and construction proposed by the A/E.
 - .2.2 Outline specifications should contain a brief, complete description of the entire project and should explain how the total work will be accomplished.
 - .2.3 The technical sections should be in outline form to serve as a guide in writing the construction document specifications. Information contained in these sections should be concise, but must name the materials, give locations (since the drawings, at this time, are not developed to the point that locations of materials are shown), indicate method of construction or installation, and indicate the finish of the completed installation.
 - .2.3.1 DO NOT write lengthy installation details and DO NOT write outline specifications as though instructing a contractor what to furnish and how to install the specified materials; save these details for the construction documents. Use of the past participle form of verbs to describe materials in place is preferred. Terse sentences, clauses, or phrases should be



used as in the following example: "Corridor Partitions: Full height construction, 8x8x16-inch non-load-bearing concrete units laid in running bond with type N mortar.

.3 CONSTRUCTION DOCUMENT PROJECT MANUAL:

- .3.1 SOLICITATION: Follow sample form provided by the Contract Administrator. The time for receipt of bids will be established by the University in cooperation with the University Architect. All copies issued must show this information. Charges for the non-refundable cost of documents will be as stated in the SOLICITATION.
- .3.2 DIVISION 00 DOCUMENTS: Obtain the most recent edition from the Contracts Administrator. Refer to the Table of Contents for proper order.
- .3.3 NUMBERING OF ITEMS: In order to distinguish CSI divisions in the specifications from divisions of the work, use Arabic numerals for CSI divisions.
- .3.4 WAGE RATES: Wage rates shall be bound into each set of Project Manuals as a part of the General Conditions.
- .3.5 SUPPLEMENTARY CONDITIONS: The A/E is cautioned to study the General Conditions plus Supplementary Conditions before beginning the preparation of Project Manual and to refer to them constantly throughout the writing of specifications. Particular attention should be paid to standardized or computerized specifications written by outside firms, who are employed to write technical sections, to ascertain that nothing contained in those specifications disagrees with provisions in the General Conditions or these supplements. Complete coordination of all Construction Documents is the responsibility of the A/E.

.3.5.1 ARTICLES WHICH REQUIRE SPECIAL ATTENTION

ART. 4 DEFINITIONS, ITEM 4: The A/E shall name itself and shall list its business address.

ART. 5 CUTTING AND PATCHING: A/E to make certain that cutting and patching instructions are consistent.

ART. 12 PROJECT SIGN: Signs are required. Specifications for the sign should be made a part of the section entitled TEMPORARY FACILITIES. The PM shall consult with the University's Signage Coordinator (SC) and submit a sign request form <https://fod.osu.edu/make-request>.

ART. 14 GUARANTEE/WARRANTY: There are exceptions to the one year guarantee period. Items for which longer guarantee periods are required are indicated in Divisions 01 through 48 of these guides. The



University Architect will indicate any other portions of the work on which a longer guarantee period is desired.

.3.6 GENERAL CONDITIONS:

.3.6.1 ARTICLES WHICH MAY REQUIRE SPECIAL ATTENTION

SHOP DRAWINGS: Explicit instructions for these submittals, as well as for submittals of samples, if different, should be given in the section entitled **SAMPLES AND SHOP DRAWINGS** in Division 01.

CLEANING UP: Additions and modifications to this article, if lengthy, should be made in the section entitled **CLEANING UP** in Division 01.

JOB MEETINGS: Detailed instructions, if different, for scheduling meetings, keeping of records, and distribution of minutes of such meetings should be given in the section entitled **SCHEDULES AND REPORTS** in Division 01. In writing this section, amplify the provisions stated but **DO NOT** change the intent of the article.

PAYROLL SUBMITTALS AND WAGE DETERMINATION: For projects in which Federal funds are involved, wage scales must be obtained from the U.S. Department of Labor. For State projects, wage scales must be obtained from the State of Ohio, Department of Commerce, Industrial Compliance Division. Ascertain, from the date on the wage scales received, that the schedule of wages will be applicable during the bidding period. Update the schedule by addenda, as required during the bidding period.

UTILITY SERVICE INTERRUPTION AND COORDINATION WITH UNIVERSITY OPERATIONS: The bidders shall be cautioned that the university will probably schedule interruption of services at times other than contractor's normal working hours and only designated university personnel are authorized to interrupt services. Frequently, outages are scheduled between semesters to reduce disruption of classes.

PENETRATION OF FLOORS AND OF FIRE-RATED WALLS: Penetration by pipes, ducts, conduit, etc. is prohibited, unless openings are appropriately fire-stopped by fire dampers or sealing of voids with fireproof materials. Fire-rated walls or floors must not have the rating reduced by penetrations or reduction of thickness. Precautions must be used by contractors when coring or making penetrations to ensure that the cored material does not drop to the floor below and cause accident or injury.

.3.7 TECHNICAL SECTIONS:



- .3.7 .1 SPECIFICATION FORMAT: The division numbers used in Divisions 01 through 48 of this publication generally conforms to the Construction Specifications Institute Masterformat current edition.
- .3.7 .2 NUMBERING SYSTEM: Division numbers used in preparation of specifications shall generally conform to the CSI Format. Section numbers may be as listed in the format or sections may be numbered consecutively by either the number or the letter designations. Within the sections, the A/E may, as he chooses, use a decimal numbering system, as used in this publication, or an alphanumerical system to designate articles, paragraphs, and subparagraphs. Do not number each line. Written material shall be organized within each article so that related thoughts are grouped under one designation, either a number or a letter, in logical sequence. DO NOT number or letter each separate sentence or thought.
- .3.7 .3 MATERIALS AND EQUIPMENT: Specify by performance specifications or by manufacturers' model numbers. If manufacturers' model numbers are used, name three or more manufacturers whose products are equal or superior in:

Appearance	Function
Quality	Operation
Design	Service Life

State that the drawings and specifications are based on the first product named and that the contractor must make all changes required to accommodate products of other manufacturers. The A/E is responsible for ensuring that all brands specified are compatible with the basic building design insofar as size, weight, and services and that brands specified are truly equal or superior in properties listed above.

.3.7 .4 COMPUTERIZED OR STANDARDIZED SPECIFICATIONS:

The A/E is cautioned that computerized specifications must be edited to suit the requirements of the project being specified. The plea that this mandatory editing and rewording of the A/E's "standard" specifications will result in excessive costs or delays in producing the construction document submittals will not be considered as warranting publication of a specification which does not fit the work. Computerized specifications must be printed on letter size paper.

.3.7 .5 PROHIBITED WORDAGE: The following words, phrases, and clauses are expressly prohibited:

- .3.7 .5.1 The note "by others". These words must not be used, either on the drawings or in the specifications. In lieu of these words, name the specific contractor or agent.



- .3.7 .5.2 The word “Owner”. The State is the owner of a project under construction and remains the owner until completion or later, when the University becomes the owner. Since the University becomes the ultimate owner, use the word “University” in lieu of “Owner”.
- .3.7 .5.3 The words “Using Agency” or “User”. The University Architect Project Manager acts on behalf of ALL University agencies including the using agency to see that requirements of the University are satisfied. The A/E is responsible only to the University Project Manager, not to the “using agency”, “user”, or other university agencies.
- .3.7 .5.4 The words “This Contractor shall . . .” to begin instructions to a contractor. These words are redundant since instructions are directed to a single prime contractor and it should be obvious to which contractor the instructions are directed.
- .3.7 .5.5 The words “alternate” or “substitute” to indicate an “option”. The word “alternate” should be used only for alternative work which is specified in the technical sections of the specifications and must be included in the bidders’ proposals. The word “option” should be used to indicate items for which the contractor may make a choice without affecting the contract.
- .3.7 .5.6 The word “mechanical” when referring to the Plumbing Contract, the Fire Protection Contract, or the HVAC Contract, or when referring to any of the contractors for these divisions of the work. The applicable word “plumbing”, “fire protection”, or “heating, ventilating, and air conditioning” must be used when making these references. On drawings, avoid using “mechanical” to describe pipe or duct chases, HVAC equipment rooms, electric equipment rooms, etc.
- .3.7 .5.7 The words “comparable” or “equal” or “similar.” Be specific.
- .3.7 .5.8 The phrase “latest edition” when referring to a code or any trade, technical, federal, military, or other “standard” specification is prohibited. The A/E must list the code or standard by name and number and indicate the date of the edition, as well as the latest revisions thereto. Referenced dates must be those in effect at time of plan approval.

END OF PROCESSING THE WORK