

---

**Document Submittal & Review**

Page 1 of 11

Last Update: [November 18, 2009](#)

A. Introduction:

1. Most University projects require six distinct phases; five of which are design phases (items a through e below) followed by a sixth final submittal (item f below): If there are variations to the information herein as it relates to individual projects the variations will be outlined in the RFP.
  - a. Schematic Design
  - b. Design Development
  - c. Intermediate Bid Documents
    - 1) This document set is to verify that the DD comments are understood and being properly implemented
  - d. Final Review Bid Documents
    - 1) This document set is a complete set of construction documents for owner review and offers the last opportunity for revisions to be incorporated into the Bid Documents.
  - e. Bid Documents
    - 1) This is the document set that is initially delivered to contractors. All specification sections and drawing sheets should be complete. Comments will be addressed by addenda.
  - f. Contract Documents
    - 1) This is the complete and legally binding set of documents that includes the Bid Documents with accepted alternates delineated, and all Addenda.
2. After the submittal expectations for a phase (as outlined below) are successfully met the Consultant will receive notification from the University Project Manager releasing them to proceed with the next phase of the project. If the University Project Team is not satisfied that the submittal expectations have been met then the Consultant will be required to re-submit the design phase package at a date to be determined by the University Project Manager.

B. Submittal Review:

1. The Consultant will submit one reproducible set of documents for each of the six phases.
2. Written comments from Purdue's Project Manager should be expected within three weeks from the date of delivery of the plan submission.
3. Consultant will respond in writing to each of the review comments.
4. At each phase of the design process the University will require submittal review meetings. Additional meetings will be covered in the RFP.
5. Typical expectations for each phase are listed in this section.

C. Requirements Common to All Project Phases:

---

**Document Submittal & Review**

Page 2 of 11

1. General
    - a. Construction cost estimate arranged by discipline including identification and estimated cost of any Owner-provided equipment or materials
    - b. Code review for all disciplines
    - c. Basis of Design for all disciplines
    - d. Review of University Design Standards and a list of non-compliance issues
  2. Energy & LEED
    - a. Describe energy efficiency and sustainability aspects of the design approach integrated between all disciplines
    - b. Show compliance with ASHRAE 90.1 Energy Standard latest edition
    - c. Show the energy modeling as developed for that phase
    - d. Provide estimate of annual energy consumption
    - e. Provide a list of potential energy savings options
    - f. Provide LEED project checklist (if seeking certification)
    - g. Provide LEED Basis of Design document (if seeking certification)
- D. Schematic Design Requirements:
1. Architectural
    - a. General floor plans showing mechanical & electrical rooms, loading docks, and janitor/service areas
    - b. Exterior elevations
    - c. Critical interior elevations
  2. Structural
    - a. System description
    - b. Seismic Design Category
    - c. Seismic analysis
    - d. Schematic foundation and framing plans
    - e. Roof fall protection provisions
    - f. Design load assumptions – uniform, concentrated, special
    - g. Vibration sensitive areas
    - h. Design vibration criteria
    - i. Geotechnical design parameters
  3. Electrical
    - a. Site plan
    - b. Power system description including simplified single line and riser diagrams

**Document Submittal & Review**

Page 3 of 11

- c. Narrative system description for lighting including lamp type, direct or direct-in-direct, dimming or non-dimming
  - d. Description of the proposed lighting control / dimming system
  - e. Narrative description of lighting design illumination levels and target LPD's for each type of room
  - f. Narrative system description for power distribution; include a simplified single line and riser diagram
  - g. Electrical room locations and sizes
  - h. Life Safety Design, Generator or Battery Backed-up lighting
  - i. Card Access and Security System brief description
  - j. A/V system description if applicable
  - k. Clarification of any owner furnished items
  - l. Acknowledge that a comprehensive three part (As-Drawn, Construction and Final) Arc Flash Study will be provided congruently with the project design and by whom (project A/E or third party consultant)
  - m. Proposed table of contents for the specifications.
  - n. Seismic Restraint Requirements
4. Mechanical
- a. Narrative system description including quantity and approximate size of major equipment, proposed mechanical systems (HVAC, plumbing, temperature control) and system design options
  - b. Seismic Restraint Requirements
  - c. Energy Efficient Design - Describe energy efficient design approach. Integrate with architectural design of the building envelope
  - d. Describe the load calculations and the level of energy modeling to be used for energy efficient design
5. Controls
- a. Description of control sequences for mechanical equipment
6. Fire
- a. System description including need for new fire pump
  - b. Verify fire flow water requirements
7. Utilities
- a. Proposed load calculations and service requirements in the narrative
  - b. One line diagram of proposed utility connection points including: storm sewers, sanitary sewer, electricity, domestic water, chilled water, steam, steam tunnel and natural gas (if required)
  - c. Location of HV vault or pad mounted equipment
  - d. Line diagram of basic layout including transformer voltages and approx KVA

---

**Document Submittal & Review**

Page 4 of 11

- e. Building footprint overlaid on site plan for evaluation
- 8. Telecommunications
  - a. New and/or existing telecommunication room locations
  - b. Symbols legend
  - c. "T" sheets with floor plan
  - d. Existing pathways (field verify)
- E. Design Development Requirements:
  - 1. Requirement common to all disciplines
    - a. List of specification sections to be included in bid documents
    - b. List of drawing sheets to be included in bid documents
    - c. Construction phasing plan
    - d. Utilities outages and lengths of utility shutdowns
    - e. Temporary bracing requirements
    - f. Major equipment lead times
  - 2. Architectural
    - a. Dimensioned floor plans
    - b. Preliminary exterior elevations (where appropriate)
    - c. Critical interior elevations (coordinate with PM)
    - d. Roof layout
    - e. Presentation of both exterior and interior material recommendations to Purdue. Consultant must gain written approvals for all material selections from Purdue and keep record of any changes throughout the project.
  - 3. Structural
    - a. Legend
    - b. Code Review
    - c. Foundation Plan
    - d. Framing Plan
    - e. Roof Framing Plan
    - f. Lateral force resisting system
    - g. Sections and Details (60%)
    - h. Roof fall protection details
    - i. Schedules
    - j. Elevations
    - k. Seismic Analysis

---

**Document Submittal & Review**

Page 5 of 11

- l. Specifications
  4. Electrical
    - a. Demolition Plans
    - b. Riser diagrams
    - c. Vault and panel locations
    - d. Complete lighting plans (including night lighting and emergency lighting)
    - e. Include point-by-point diagrams illustrating illumination levels for a cross-section of typical room types; include LPD's (Lighting Power Densities) for the same rooms (show switch and lighting control device locations)
    - f. Provide Site Lighting Plan
    - g. Provide diagrams illustrating lighting controls (specify Ballast and Control Manufacturers)
    - h. Provide fixture schedule
    - i. Typical power plans
    - j. Show all electrical equipment, transformers, switchgear, panelboards, MCC's, generator and ATS's as applicable
    - k. Electrical room layouts verifying and illustrating working clearances around all electrical equipment as described in NEC 110.26
    - l. Site power plan
    - m. Standard details sheets
    - n. Standard switchboard and panelboard directories sheets
    - o. Preliminary grounding and bonding diagram
    - p. Card access and security diagrams, details including door rough-in's, and riser diagrams (same for A.V. systems)
    - q. Summary of the Arc Flash study status and hazard categories per D.D. design; point out any issues such as budget constraints regarding breaker selection and features etc. required to keep hazard categories at 2 or lower
    - r. Specifications for review
  5. HVAC
    - a. Cooling/Heating loads and corresponding air flow for each room
    - b. Enlarged mechanical room showing the location of all major equipment and coordination with other disciplines
    - c. Main duct runs
    - d. Main piping runs
    - e. Preliminary air system riser diagrams
    - f. Preliminary water system schematics
    - g. Main exhaust systems showing exhaust fan location

---

**Document Submittal & Review**

Page 6 of 11

- h. Equipment selection list showing product basis of design and anticipated approved equals
  - i. Standard details
  - j. Critical and congested building areas identified and shown in section view
  - k. Critical and congested equipment locations identified and shown in section view
  - l. Equipment schedules showing column headers
  - m. Equipment schedule showing the column headers for coordination with other disciplines including electrical MCA and MCOP and equipment weights
  - n. Preliminary specifications including a list of all anticipated sections
6. Control Systems
- a. A written sequence of operation of all controlled equipment identified
  - b. The sequences will include:
    - 1) A detailed operation of the equipment as engineered and designed for the specific application
    - 2) A description of the operation of all input and output ddc points for monitoring or control shall be defined in the sequence of operation
    - 3) Run conditions
    - 4) Occupied/Unoccupied periods
    - 5) Freeze protection
    - 6) Economizer cycle
    - 7) Cooling control
    - 8) Return Chilled Water control
    - 9) Heating control
    - 10) Humidification and Dehumidification control
    - 11) Pressure control
    - 12) Building static
    - 13) Duct static pressure
    - 14) Water Differential Pressure
    - 15) Control set points
    - 16) Alarm set points (when to alarm)
    - 17) Alarms
    - 18) Pressure
    - 19) Temperatures
    - 20) Humidity
    - 21) Minimum Outdoor Air

---

**Document Submittal & Review**

Page 7 of 11

7. Plumbing
  - a. Building utility loads
  - b. Fixture load calculations
  - c. Enlarged mechanical room layout coordinated with other disciplines
  - d. Piping chase locations
  - e. Main sanitary piping layouts showing invert at building exit
  - f. Main domestic water piping layouts
  - g. Main storm water piping layouts showing invert at building exit
  - h. Equipment selection list
  - i. Standard details
  - j. Equipment schedules showing the column headers for information to be included
  - k. Preliminary specifications including a list of all anticipated sections
8. Fire Protection
  - a. Fire Protection equipment and panel locations
  - b. Preliminary specifications including a list of all anticipated sections
9. Utilities
  - a. Refined utilities routing showing details of installation, i.e. materials and sizes
  - b. Layout of HV vault or pad mount with dimensions and critical clearances
  - c. Vault design including, vents access panels, means of egress, sump, etc.
  - d. Preliminary sequencing coordination (if required)
  - e. Verify Fire flow water requirements
  - f. All tie-in points between exterior and building utilities shown and responsibility delineated
10. Civil & Landscape
  - a. Entrances
  - b. Extent of Demolition
  - c. Utility locations
  - d. Roads & driveways locations
  - e. Loading dock locations
  - f. Walkways
  - g. Parking
  - h. Dumpster locations
  - i. Soil sample locations
11. Telecommunications

---

**Document Submittal & Review**

Page 8 of 11

- a. Telecommunication cable tray distribution in corridors
  - b. Existing and new telecommunication outlet locations throughout affected area
  - c. General telecommunications room layouts showing equipment frame locations on floor plan and electrical outlets in telecommunications rooms
  - d. Outside plant entrance conduit routes
  - e. Site survey drawings indicating OSP telecom cables disturbed by construction project
  - f. Purdue's telecommunication details (not modified)
  - g. Indication of the removal/remain/relocation of existing telecommunication outlets throughout the renovated area
12. Environmental
- a. Submit Environmental Checklist: <http://www.purdue.edu/architect/resources/forms/>
- F. Intermediate Bid Document Requirements:
1. Architectural
    - a. Dimensioned floor plans
    - b. Dimensioned exterior elevations
    - c. Dimensioned interior elevations
    - d. Roof flashing details
    - e. Reflected ceiling plans
    - f. Elevator details and schedule
  2. Structural
    - a. Listing of all structural sheets required for bid
    - b. Foundation Plan
    - c. Framing Plan
    - d. Roof Framing Plan
    - e. Lateral force resisting system
    - f. Sections and Details
    - g. Roof fall protection details
    - h. Schedules
    - i. Elevations
    - j. Seismic Analysis
    - k. Specifications
  3. Electrical
    - a. Final Voltage drop calculations

---

**Document Submittal & Review**

Page 9 of 11

- b. Final Arc Flash Study
  - c. Final Short Circuit Study
  - d. Final calculations complete with recommended OCP (Over Current Protection) device settings
  - e. Final photo-metrics and LPD's. for typical room types and additional rooms specifically requested
  - f. Final Loads to the primary side
  - g. Single line and riser diagrams are complete
  - h. Grounding and bonding diagram complete
  - i. Vault and panel locations
  - j. Load sheet is complete
  - k. All lighting plans, details, lighting control wiring details, fixture wiring diagrams, details for any day light harvesting schemes and fixture schedules, complete
  - l. Provide lighting scene / fixture programming schedules
  - m. All power plans complete, including connections to all mechanical equipment (AHU's, pumps, VFD's, etc.).
  - n. Electrical room layouts are complete
  - o. Wiring diagrams and circuiting illustrations are substantially complete
  - p. Generator and related auxiliary system details all complete.
  - q. All electrical signage, locks, exit hardware drawings and specifications all complete.
  - r. Fire Alarm drawings all complete.
  - s. Card Access and security systems drawings, details and specifications all complete.
  - t. A/V systems drawings, details and specifications all complete.
  - u. Details sheets are complete
  - v. Schedule sheets are filled in
  - w. Switchboard and Panelboard Directories sheets complete
  - x. Site lighting/power/utilities plan complete
  - y. Specifications complete
4. HVAC
- a. Enlarged mechanical room layout complete
  - b. All duct work complete and shown in dual line graphical representation
  - c. Section views of critical areas complete
  - d. All piping runs complete with the direction of each take-off indicated
  - e. All exhaust systems layouts complete

---

**Document Submittal & Review**

Page 10 of 11

- f. Equipment selection list is final
  - g. Equipment hookup details complete
  - h. Piping, ductwork, etc. details substantially complete
  - i. Equipment schedules complete
  - j. Smoke control scheme complete
  - k. Air handling unit schematic diagrams with temperature, air flows and static pressures complete
  - l. Total building air flow schematic diagrams with temperature, air flows and static pressures complete
  - m. All specifications sections edited, spell checked, and coordinated with other disciplines
5. Controls
- a. Completed Sequence of Operations
  - b. Schematic diagrams showing all direct digitally controlled (DDC) components, devices, and I/O points for mechanical equipment.
6. Plumbing
- a. Enlarged mechanical room layout complete
  - b. All piping run layouts are complete with the direction of each take-off indicated
  - c. Piping isometrics substantially complete
  - d. All required details
  - e. Equipment schedules complete
  - f. All specifications sections edited, spell checked, and coordinated with other disciplines
7. Fire Protection
- a. Fire Protection drawing complete
8. Utilities
- a. Final utilities routing is complete with all required details
  - b. Detailed vault design with equipment layout and complete dimensioning
  - c. Final transformer KVA
  - d. Sequencing coordination (if required) is complete
  - e. Lay down area and temporary services identified
  - f. Traffic control plan (if required) is complete
  - g. All DD comments have been addressed
  - h. All pipes sized
  - i. Existing tree protection plan
9. Telecommunications

**Document Submittal & Review**

Page 11 of 11

- a. Telecommunication outlet locations throughout building
- b. Detailed telecommunications room layouts showing wall elevation details, equipment frame elevation details, and punch block locations
- c. Room schedule indicating telecommunication outlets per room
- d. Complete telecommunications riser diagram
- e. Purdue's telecommunication outlet details (modified for project)

G. Final Review Document Requirements:

1. This is to be a 100% completed document set for final review.
2. This document set shall be submitted at least three weeks prior to first advertising date.

H. Bid Document Requirements

1. This is to be a 100% completed document set for distribution to the contractors for bid preparation.
2. Provide Purdue with three (3) Exterior Finish Control Books and three (3) Interior Finish Control Books.
3. Bid documents should be submitted no less than two working days prior to first advertisement date.

I. Contract Document Requirements

1. See Section AEC CADD Standards – Archival Documents for requirements of delivery of Final Instruments of Service.