# GENERAL

## SUMMARY

### This Section specifies administrative and procedural requirements for Contract closeout including, but not limited to:

#### Project Record

#### Operation and Maintenance Manuals

#### Warranties and Bonds Manual

#### Operating Instructions and Training

#### Cleaning

#### Owner’s Final Inspection

#### Substantial Completion

#### Final Completion, and

#### Final Acceptance

### For additional specific construction Work, closeout requirements are described in Divisions 02 thru 49 of the Specifications.

## PROJECT RECORD

### General: Project Record documents include the Contractor’s Red Line Drawings as-built Specifications, and as-built Shop Drawings required by the Contract Documents. Project Record documents must be maintained in electronic document form such as Microsoft Work, Excel, PDF, AutoCad, etc.

### Red Line Contract Drawings: Maintain a set of prints or electronic bid set Contract Drawings and approved Shop Drawings. Mark the drawings to show new information that was not shown on the bid set Drawings, and on the approved Shop Drawings, including the actual installation where the installation varies substantively from the work as originally shown. Mark drawings to show conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

#### Show bid addenda items, Change Orders, and Request for Information (RFI) responses by their number, and date the revisions with a “cloud” around the revision.

#### Keep accurate measurements of below-grade site work, including permanent shoring, in accordance with Section 01 71 23 “Field Engineering.”

#### Show mechanical dampers, valves, reheat boxes, cleanouts, and other equipment and items that require maintenance.

#### Show location of construction-concealed mechanical, electrical and plumbing (MEP) riser installations including, but not limited to, piping, ductwork, and conduits referenced to visible and accessible features.

#### Show field changes of dimensions and details.

#### X-out conditions not constructed and appropriately annotate "not constructed" to convey the actual as constructed condition.

### If Red Line drawings are maintained in paper form, provide the following:

#### Organize red line Drawings in manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on the cover of each set.

#### Mark with reproducible pencil and distinguish between variations in separate categories of the Work. Text size is to be 1/8” minimum. Good basic drafting practice must be applied.

### As-built Specifications: Maintain one (1) copy of the bid set Contract Specifications showing all addenda, substitutions, Change Orders, and RFIs. Give particular attention to the selection of options, changes in product data, and information on elements engineered by the Contractor and note related as-built Drawing information, as appropriate. Clear, legible documentation must be applied.

### A/E Conformed Record Set and As-built Shop Drawings: The Contractor shall provide the A/E of Record all red line construction drawings, Shop Drawings, etc. to incorporate into the fnal A/E Conformed Record Set. The Contractor Shop Drawings and the A/E Conformed Record Set Drawings shall comply with the following CAD (Computer-Aided Drafting), BIM (Building Information Modeling) and PDF (Portable Document Format) standards and requirements when preparing as-built record Shop Drawings required by the Contract Documents.

* + - 1. Cover sheets shall contain a complete index of all sheets.
      2. Symbols shown must be symbols used in the Contract Documents.
      3. Standard drafting practice shall be:
         1. Title block

1. All sheets shall have a title block.
2. Title block information is to be on the right side of the sheet.
3. Title blocks shall include the following information:

Date

University Project Name

University Project Number

University Facility Number (FACNUM)

Sheet name

Sheet number

Design-Builder or Subcontractor company name

A Key Plan

* + - * 1. Area of Work: CAD drawings shall include a boundary that defines the area of work, showing only the area where work is performed.

3. BIM STANDARDS

Format

BIM models must be submitted in Revit .RVT format in a mutually agreed upon release.

Packaging for Submission

Models must be detached from central

All worksets must be relinquished

On final export dialog box, UNCHECK the box saying “Export views of sheets and links as external references.”

Use eTransmit to package model and related files.

File Names

Revit model file names must start with the UW PDG Project Number

* + - 1. CAD STANDARDS

Format

CAD files must be submitted in AutoCAD .dwg format.

File Organization

Each CAD drawing file must represent a single printed sheet.

File Names

Drawing and PDF file names must be titled <Sheet Number> <Sheet Name>.

Examples: A-101 1ST FLOOR PLAN.dwg; A-101 1ST FLOOR PLAN.pdf

Image and .PDF References

Unreferenced and Unloaded images must be detached from the drawing.

No Unreferenced or Unloaded images or PDF underlays should appear in the Xref Manager

External References (XREFs)

External drawing references are not allowed.

External references used during the project must be bound using the ‘Bind’ option (instead of the ‘Insert’ option) before submitting.

* + - 1. *PDF* STANDARDS
         1. Single Sheet .PDF

Each .PDF file must represent a single sheet and must not contain multiple pages.

* + - * 1. File Names

.PDF file names must match the corresponding .DWG file names except for the file extension.

* + - * 1. File Creation

.PDF files are to be created by printing from the native CAD/BIM format by printing to PDF. Scanning is not permissible.

* + - * 1. Layer Content

.PDF files must not contain layers.

* + - * 1. Image Resolution (if applicable).

All documents must be created with a resolution of no less than 300 dpi.

* + - * 1. Fonts

All fonts must be embedded in the .PDF.

* + - * 1. Compression

When compression is used, the algorithm must be LZW, CITT Group 4, or PackBits.

* + - * 1. Page Size

The .PDF page size must be the same as the original page size if the page were printed.

Example: ANSI D sized sheet must have a .PDF sheet size of 22 x 34.

Verify URL for Layering format is accurate. Consult with the University’s Project Manager if the address is incorrect or the link is broken.

#### CAD Compliance Submittal Review Requirements: CAD Shop Drawings shall be electronically submitted for Owner’s CAD compliance review and approval prior to submitting as-built record Shop Drawings. The Contractor may request a compliance review at any time during the work prior to Substantial Completion.

#### Project Record submittal: Provide all record as-built Shop Drawings required by the Contract Documents in CAD, BIM and PDF format (per the requirements of Section 01 33 00 “Submittal Procedures”).

##### CAD files shall be submitted in latest release of AutoCAD .dwg format.

###### Custom menus or arx applications are not allowed if they create a requirement for the drawing to be used. No menus, custom user interface files or arx applications are to be submitted.

###### Each CAD drawing shall represent a single printed sheet where the file name conspicuously identifies the sheet number (e.g. sheet A2.1 CAD file name might be A2-1.dwg).

###### For all disciplines in a submittal, the CAD drawings shall be in a single folder. One folder per discipline, by discipline name (Civil, Landscape, Architecture, etc.).

## OPERATIONS AND MAINTENANCE (O&M) MANUALS

### Separate manuals shall be provided by the Mechanical and Electrical (M&E) Subcontractors titled MECHANICAL or ELECTRICAL and an additional manual provided by the General Contractor titled ARCHITECTURAL for all other information. The preliminary manuals shall be labeled “Preliminary” and comply with all requirements.

### The O&M Manuals shall contain all the information needed to operate, maintain and repair all systems, equipment, and product finishes provided in the Project. They shall be presented and arranged logically for efficient use by Owner's operation personnel. As a minimum, the information provided shall include, but not be limited to, the following: (see Architectural, Mechanical and Electrical Divisions for additional requirements)

#### Product description including, but not limited to, manufacturer, product name or equipment make and model number (and other nameplate data), size and dimensions, color, Material Safety Data Sheets (and related product information), and other pertinent information

#### Supplier's name, address, e-mail address, phone, and reference order numbers

#### Product finishes maintenance and cleaning instructions

#### Performance and calibration data for specific product provided (extraneous catalog data must be eliminated)

#### Descriptions and diagrams of system assembly and configuration (including components and interrelations)

#### Manufacturer’s recommended equipment operating and maintenance instructions, including routine lubrication and servicing data, start-up and shutdown procedures, and any seasonal or emergency procedures

#### Manufacturer’s checklists and methods for troubleshooting

#### Complete parts list with parts numbers indicating common replacement parts and anticipated useful life

#### Copies of: digitally signed warranties; any certificates from respective manufacturers, suppliers, and Subcontractors; permits and/or licenses, and; equipment maintenance and service contracts.

### The O&M Manuals shall contain the following information for specified items, when the item is specified elsewhere in the Contract Documents:

#### As-built door hardware schedule and submittal documentation

#### Elevator systems documentation

##### Wiring/equipment locations diagrams

#### Refrigeration controls schematics/sequence of operation documentation

#### Motors data and variable frequency drives (VFDs) documentation

##### Final settings programmed into the VFDs

#### Fan and pump curves documentation

#### HVAC filters schedule

#### Environmental controls systems (ECS) documentation including hardware and software manuals

#### Electrical--Short Circuit Coordination and Arc Flash Study Report

#### Pull calculations documentation for MV wire, cable, and terminations

#### Electrical transformer factory test reports documentation

### Drawings included in the manual shall not exceed 11” x 17.”

## WARRANTIES AND BONDS MANUAL

### Assemble executed warranties and bonds, and any certificates from the respective manufacturers, suppliers, and Subcontractors. Provide preliminary review copies of all warranties and bonds and a final manual with the original documents, titled “Warranties and Bonds Manual.” Manuals shall be assembled in the same format as the O&M Manuals and include a table of contents in complete and orderly sequence.

## OPERATING INSTRUCTIONS AND TRAINING

### The Contractor shall provide on-site instruction and training for Owner's personnel in all aspects of the philosophy, operation and maintenance of equipment and systems. Instruction and training shall be provided by a qualified trainer from the Contractor or Subcontractor who supplied and installed the equipment and systems and/or a manufacturer's training representative who is familiar with all aspects of the design, operation, maintenance, and troubleshooting of the specified equipment and systems. Training shall be conducted in a classroom setting with appropriate schematics, handouts, and audio/visual aids. All training shall also be digitally recorded in video, cataloged, and provided to Owner in a DVD or thumb drive labeled with session identification and date. Attendance shall be recorded. For work requiring commissioning, see Section 01 91 00 “General Commissioning Requirements” for further training session agenda requirements.

#### Prepare and submit a training plan for Owner’s information and coordination. For each training session, the training plan shall include the following:

##### Dates, start and finish times, and locations

##### Outline of the information to be presented

##### Names and qualifications of the presenters

##### List of texts and other materials required to support training

## CLEANING

### Contractor clean up during construction is specified in the Contract Documents.

#### If Contractor fails to clean as specified in the Contract Documents, and after reasonable notification from Owner, Owner may do so and the cost thereof shall be charged to the Contractor.

#### For work in medical centers, reference housekeeping in Section 01 35 33 “Infection Control.”

#### Contractor shall employ continuous housekeeping cleaning during construction to minimize interior construction dust and particulates during the Work.

### Preliminary Cleaning: Perform the following preliminary cleaning operations as a prerequisite for Owner’s Final Inspection. The following are examples, without limitation, of minimum cleaning requirements:

#### Remove labels that are not permanent.

#### Remove temporary protective coatings and wrappings from all products.

#### Remove glazing compounds and other vision obscuring substances from transparent and reflective materials provided by the Contractor including, but not limited to, mirrors, glass in doors and interior construction, glass canopies and skylights, and windows inside and out.

#### Clean all exposed building interior surfaces, including cabinet interiors, and new exterior surfaces to be free of foreign substances including, but not limited to, stains and films.

#### Leave floors broom-clean. Vacuum carpeted surfaces and clean consistent with manufacturer’s recommendations for installation.

#### Remove and clean all construction debris and refuse from:

##### Roofs, mechanical and electrical rooms, tunnels and equipment vaults

##### Limited access spaces, including above ceiling areas and shafts

##### Physically inaccessible components of the Work including wall and chase cavities, gutters and downspouts, floor drains and other drainage systems

#### Wipe surfaces of M&E equipment, including elevator equipment and similar Architectural equipment. Remove excess lubrication and other substances.

#### Clean the Project site of construction waste, rubbish, and litter. Sweep paved areas broom clean and remove stains, spills, and other foreign deposits.

### Final Cleaning: Prior to Substantial Completion, employ experienced workers or professional cleaners for final cleaning of the Work. Clean to a condition expected of a normal commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

#### Leave entire Project clean and ready for occupancy. All new interior, including cabinet interiors, and exterior building surfaces, fixtures and equipment shall be turned over to the Owner in a new condition, free of all damage, dust, dirt, spots, stains, encrustations, and other blemishes.

#### Clean transparent materials including mirrors, glass in doors and interior construction, glass canopies and skylights, and windows inside and out.

#### Clean plumbing fixtures to a sanitary condition.

#### Clean light fixtures and lamps.

Custodial Services applies wax and sealers to most new floors on the University of Washington Seattle campus. Exceptions include the University of Washington Medical Center and Housing and Food Services projects. Select one of two options for floor finishes. Delete the option that does not apply. Consult with the University’s Project Manager.

The first option: Owner will finish the floors.

#### Owner will wax and apply sealers to vinyl composition tile and sheet vinyl floors.

The second option: Contractor will finish the floors.

#### Apply floor finishes.

### Compliance: The Contractor shall:

#### Use non-toxic Green Seal Certified cleaning products, or products with low-volatile organic compounds (VOC), and cleaning paper with a post-consumer recycled content;

#### Employ equipment with high efficiency particulate filtration and sweep compound to keep dust down; and

#### Comply with current regulations and standards of authorities having jurisdiction and the safety standards for cleaning specified in the manufacturer’s instructions.

## OWNER’S FINAL INSPECTION

### Prior to Final Inspection: The Contractor shall satisfactorily complete the following actions prior to the Owner’s final inspection of the Project.

#### Submit written notice that the Project is ready for final inspection. Include a copy of the Contractor’s final punch list report (see Section 01 45 00 "Contractor Quality Control") and list all incomplete work items that have been reviewed with the Owner, and which the Owner has agreed are not necessary prior to Substantial Completion.

##### Include: a written plan/schedule outlining all actions necessary to achieve Substantial Completion, without requiring extra ordinary participation by Owner and A/E.

#### Complete preliminary cleaning operations.

#### Submit a list of all equipment and systems requiring instruction and training with a proposed schedule of times and locations for the instruction, for Owner’s review and comment.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### Replace all ventilation systems air filters specified for construction with final filters.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### Complete start up and functional performance testing of all systems required by the Contract Documents and AHJ including, but not limited to: electrical testing; environmental control systems point-to-point testing; emergency eyewash and safety shower testing; fume hood face velocity testing; and HVAC air balancing (if included in the scope of the Work).

Delete the following paragraph for projects that do not have commissioning requirements. Delete if it is not otherwise required by the Contract Documents. Consult with the University’s Project Manager.

#### Submit one (1) hard copy each of the current air balancing report and the M&E Commissioning Binders labeled “Preliminary,” listing all deficiencies, for Owner’s review and comment.

Delete the following paragraph for projects that have commissioning requirements. Delete if it is not otherwise required by the Contract Documents. Consult with the University’s Project Manager.

#### Submit the final mechanical pressure test and flushing forms, signed-off by Owner’s Representative.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### Submit the final copper and fiber optic communications cabling test results in PDF format, on Owner’s CMS.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### Submit the final audio/visual equipment documentation including, but not limited to, manufacturer/model information and an itemized summary list with equipment serial numbers in PDF format, on Owner’s CMS.

### Owner’s Final Inspection: Upon satisfactory completion of the actions in 1.7A, Owner will determine if the Project is complete and ready for final inspection and, at Owner’s sole discretion, commence final inspection, or provide a written deficiency list of items to the Contractor of work that must be completed to the satisfaction of the Owner prior to the Owner’s final inspection. Final inspection is performed by the A/E and Owner’s representatives.

#### After the Owner has issued the final inspection list of corrective work items, the Contractor shall make the required corrections and/or identify items that the Contractor feels are not required by the Contract Documents, and resolve these items with the Owner.

### Re-inspection: Contractor shall request, in writing, re-inspection after completing the Owner’s final inspection list of corrective work items and providing the Owner the final inspection report notated with a signed-off approval for each of the corrected items. Those items whose completion is delayed due to circumstances acceptable to the Owner will be exceptions. The Owner’s Representative will back check the items or have the A/E perform a re-inspection.

#### If the A/E is required to perform more than one re-inspection, the costs for additional inspections may be borne by the Contractor, at the Owner’s sole discretion.

## SUBSTANTIAL COMPLETION

### Substantial Completion: Substantial Completion (for either the entire Work or portions thereof) shall be achieved when all Work, other than incidental corrective and incidental punch list work, is complete including, but not limited to, the following actions:

#### Complete final cleaning operations.

#### Submit the "Preliminary" Operations and Maintenance Manual for Owner’s review and comment in PDF format, on Owner’s CMS.

#### Submit all sign-offs, releases, jurisdictional settlements, judgments, and other records from AHJ allowing the Owner’s full and unrestricted use and benefit of the facilities including, but not limited to, a temporary or permanent certificate of occupancy permit, operating permits and/or licenses for the use of building equipment such as elevators, boilers, paint booths, etc. and similar necessary certificates and releases.

##### Provide a list of any outstanding work required by AHJ.

#### Submit the current Project Record as-built Drawings and Specifications identified “Preliminary” Project Record (marked with the date of submission) in PDF format, on Owner’s CMS.

#### Submit the Project Record as-built Shop Drawings required by the Contract Documents in accordance with this Section 1.2D, on Owner’s CMS.

#### Remove all construction tools and temporary facilities not required for Final Completion work from the Project site including, but not limited to, storage sheds, samples and mock-ups, Project identification signage, site fences, crane and hoist base foundation construction, temporary enclosures, and construction electrical power and service.

#### Complete Owner’s personnel operating instructions and training and submit training DVD’s.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### Deliver specified maintenance equipment and tools to Owner, with itemized summary list.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### Complete final change-over of locks, transmit new keys to Owner, and return Owner’s loaned construction keys.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### Complete all air balancing, testing and commissioning work required by the Contract Documents, allowing the Owner to fully occupy the Work for the use for which it is intended. Incidental Work, that is not life safety or occupational safety commissioning work, whose completion is delayed due to circumstances excused by the Owner, will be the exception.

If the preceding paragraph is included, select one of two options for hardcopy submittals. Consult with the University’s Project Manager.

The first option is for projects with commissioning.

##### Submit one (1) hard copy each of the current air balancing report and M&E Commissioning Binders (marked with the date of submission) noting the corrections for deficiencies listed in the “Preliminary” report and binders and indicating any incomplete Work.

The second option is for projects without commissioning.

##### Submit one (1) hard copy each of the current environmental control systems point-to-point testing documentation and (when specified as work of the Contractor) the current Testing, Adjusting and Balancing (TAB) report (marked with the date of submission).

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### Submit all controls systems software files required by the Contract Documents including, but not limited to, lighting and environmental controls.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### Submit one (1) hard copy of the current Build It LEED Toolkit ® with all LEED documentation labeled “Preliminary,” for Owner’s review and comment.

### Substantial Completion: Upon a satisfactory completion of the actions in 1.8A above and the General Conditions requirements for Substantial Completion, the Owner will prepare a letter of Substantial Completion and forward to Contractor. The letter will identify the date of Substantial Completion and include the final punch list report and the commissioning deficiencies list, listing all remaining incomplete work. Contract warranties will begin as of the date of Substantial Completion, as specified in Section 01 78 36 “Warranties,” or as otherwise indicated in the Contract Documents.

#### Substantial Completion and the start of warranties for incomplete items will be established in writing by the Owner when the item is determined complete.

## FINAL COMPLETION

### Prior to Final Completion: Final Completion shall be achieved when the Work is fully and finally complete, to the Owner’s satisfaction in accordance with the Contract Documents including, but not limited to, the following:

#### All Work, including incidental corrective or punch list work, and air balancing and commissioning work (if included in the scope of the Work) is complete and correct to the satisfaction of the Owner.

#### All remaining temporary facilities are removed from the Project site and the site (including landscape) is restored to original conditions or Contract Documents requirements.

#### All final permits, originally issued as temporary permits, have been submitted.

#### The final marked-up Project Record as-built Drawings and Specifications identified Final Project Record (marked with the date of submission) have been submitted using Owner’s construction management system (CMS).

#### The complete Operations and Maintenance Manual and Warranties and Bonds Manuals have been submitted in PDF format, on Owner’s CMS, and a hard copy of the Warranties and Bonds Manual with original documents has been submitted.

#### The Contractor’s final 3-ring binder of all MSDS used for construction, marked with the date of submission, has been submitted in PDF format, on Owner’s CMS.

#### The Contractor’s final cumulative Construction Waste Management Report (marked with the date of submission) has been submitted in PDF format, on Owner’s CMS.

#### All Change Orders are approved and signed by both parties.

#### A draft of the Final Application for Payment has been submitted to Owner for review and approval.

#### The final Schedule of Values and the Building Componentization Report in hard and electronic copies (see Section 01 29 76 “Progress Payment Procedures”) have been submitted.

Delete the following paragraph for projects that do not have commissioning requirements. Delete if it is not otherwise required by the Contract Documents. Consult with the University’s Project Manager.

#### The final air balancing report and the final M&E Commissioning Binders (marked with the date of submission) have been submitted in PDF format, on Owner’s CMS.

##### For Projects with a Test Engineer, the as-built information updating the A/E commissioning basis-of-design has been submitted with the Commissioning Binders.

Delete the following paragraph for projects that have commissioning requirements. Delete if it is not otherwise required by the Contract Documents. Consult with the University’s Project Manager.

#### The final environmental control systems point-to-point testing documentation and (when specified as work of the Contractor) the final air balancing report marked with the date of submission, has been submitted in PDF format, on Owner’s CMS.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### The software file used to calculate the power systems studies (Power Tools – SKM®) has been submitted.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### Specified spare parts, extra stock of materials, and extra materials of value to the Owner, with itemized summary list, have been submitted.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### The “Regulated Materials – Waste Manifests” (marked with date of submission) have been submitted in PDF format, on Owner’s CMS.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### For Projects at the UW Warren G. Magnuson Health Sciences Center, UW Medical Center, and Harborview Medical Center; all personnel identification badges have been returned.

Delete the following paragraph if it is not required by the Contract Documents. Consult with the University’s Project Manager.

#### All required USGBC LEED certification on-line forms are submitted and the final Build It LEED Toolkit® with all final LEED documentation including the LEED estimated construction costs have been submitted in PDF format, on Owner’s CMS.

### Final Completion: Upon satisfactory completion of the requirements in 1.9A above to achieve Final Completion, the Owner will approve and process the final Application for Payment and establish the date of Final Completion thereon.

## FINAL ACCEPTANCE

### Final Application for Payment has been approved by Owner and payment made to the Contractor.

### The Owner will establish the date of Final Acceptance and issue the letter of Final Acceptance after the Contractor has completed the requirements of the Contract Documents.

#### The Contractor shall follow the requirements outlined in the General Conditions and Section 01 29 76 “Progress Payment Procedures” for release of retainage.

# PRODUCTS (Not Used)

# EXECUTION (Not Used)

END OF SECTION