Subject:	**Construction Document Set-Up and Document Submission Requirements**	**Number: FMOP 5-2**
Approval:	**AVP Facilities Management**	**Issue Date: April 28, 2010**
Responsibility:	**Real Property Asset Management Coordinator**	
Review Period:	**3 Years**	

Construction Document Set-up and Project Submission Requirements

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1.0 Purpose of Procedure

1.1 Accurate and up to date building systems information is essential when troubleshooting or modifying an existing system. The accuracy of the record information increases efficiencies by reducing troubleshooting or design time, preventing problems, and providing a safe work environment for operations staff.

1.2 The purpose of this procedure is to establish consistent procedures for consultants and contractors for submitting the proper construction record documentation, including as-built drawings and maintenance manuals, upon project completion.

2.0 Construction Document Set-Up

2.1 **Drawing Set-up.** AutoCAD application with maximum drawing sheet size - 36”x 48”. Due to the difficulty of storing and using large sized drawings, consultants are encouraged to use the smallest drawing size practicable for the construction drawings.

3.0 Room and Door Numbering Protocol

3.1 **Room Numbers.** In accordance with the Project Submission Schedule (see Annex A), the consultant is to provide a copy of the project floor plans to Facilities Management who will assign room numbers to all spaces. The room numbers are

to be incorporated into all drawings, schedules, details, etc. by all consultants wherever required.

3.1.1 If changes during construction result in the requirement for additional room numbers, the consultant is to inform the Brock University Project Manager who will co-ordinate the assignment of additional/revised room numbers by Facilities Management.

3.1.2 As the room numbers are used by various contractors/suppliers and must co-ordinate with numerous completed systems such as the fire alarm system, building automation system (BAS), door keying system, etc., the consultant is to ensure that all drawings/specifications issued at any time reflect the actual Facility Management assigned room numbers, and the general contractor has been informed.

3.1.3 Room numbers are to be enclosed by an *oval shape*. Room numbers inside the *oval shape* will be the basis for:

3.1.3.1 door numbers, fire panel configuration, electrical panel schedules and any other building automation systems (B.A.S.) / control reference (electrical or mechanical).

3.1.4 Consultants who require any other type of "identification numbers" in order to communicate room finishes can choose not to have a shape around "identification numbers" or can use another shape. Some instances where "identification numbers" may be used occur when:

3.1.4.1 Spaces have odd configurations (e.g. more than 1 north wall) or when various finishes are assigned to the same wall, floor, ceiling, etc.

3.1.5 "Record Drawings" are to reflect room numbers that have been processed during these timeframes.

3.2 **Door Numbers.** Consultants are to use the following Brock University door numbering system which is to be incorporated into all drawings, schedules, details, etc. by all consultants as required.

3.2.1 1 door to room: door number to match room number

3.2.2 2 doors to a room: 2nd door number to match room number and receive "-1"(dash and the number 1)

3.2.3 3 doors to a room: 3rd door number to match room number and receive "-2" (dash and the number 2), etc.

3.2.4 Exterior Doors: door number to match room number with "-EX1", "-EX2" etc. after the door number.

3.2.5 Prior to finalizing door numbers, consultant is to obtain Facilities Management approval.

4.0 Project Close-Out Document Requirements

4.1 At project completion, the prime consultant (or construction manager) is to arrange for the turn-over of the following project close-out documents to the Facilities Management Project Manager:

4.2 **Record Drawing Information.** Construction record information consisting of the following documentation is required:

4.2.1 *Drawing List:* a complete list of contract drawings (with drawing number, title, revised date and file name) issued by all consultants in Excel application format and saved to CD/DVD, also provided in hardcopy.

4.2.2 *Final Revision Drawings*: the consultants are to electronically incorporate all major changes to the drawings during the course of the work. At the end of the construction period, each consultant is to label all drawings "Final Revision Set" in the revision column of the title block.

4.2.3 *As-Built Information:* Prior to construction, the consultant will provide the contractor with a full sized set of drawings on which the contractor shall clearly mark, as the job progresses, all changes and deviations from that shown on the contract drawings. The contactor shall take 'as-built' measurements to locate all concealed work which will be dimensioned from fixed points. Drawings shall be kept up-to-date during construction and in addition to field measurements shall include change orders, site instructions and all other changes. Prior to making the application for substantial performance of the contract, the contractor shall submit the completed as-built drawings to the consultant for their review and incorporation into the Final Revision Set.

4.2.4 *Record Drawings:* upon receipt of the contractor's marked up (hardcopy) as-built drawings, each consultant discipline will incorporate this information on the Final Revision Set and indicate "Contractor's As-Built Information Added" in the revision column of the title block. The entire set of construction drawings (whether as-built information was incorporated or not) will become the "Record Drawings".

4.2.5 *Project Submission Schedule:* The Project Submission Schedule (see Annex A) lists the submission requirements for the above referenced documents the duration of the project.

4.3 **Maintenance Manuals.** Consultants are to include in the specifications, the requirement that the General Contractor, Construction Manager, or Design-Builder, provide the University with maintenance manuals. In addition to the specific content information determined by the consultant(s), the maintenance manuals must conform to the following format:

4.3.1 Copies required: all disciplines – 2 sets of each.

4.3.2 The manuals are to be submitted according to discipline as follows:

4.3.2.1 Architectural/Structural

4.3.2.2 Mechanical

4.3.2.3 Electrical

4.3.2.4 Commissioning Reports

4.3.2.5 Other

4.3.3 A warranty list should be included at the beginning of each respective binder.

4.3.4 Binders are to be sized appropriately for the information contained within. Do not submit information in oversized binders.

4.3.5 At the discretion of the University, manuals for small projects with limited information may be submitted in a single binder.

4.3.6 The first architectural binder is to include a list of all participants involved in the construction of the project including all consultants, contractors and suppliers responsible for preparing close out documentation and as built drawings.

4.3.7 Each binder is to include a table of contents with numbered tabs cross referenced to the table of contents and identifying each section.

4.3.8 Binders are to be labeled on the spine and front cover including project name and contents of binder.

4.4 **Project Specifications.** Consultants are to provide the University with copies of the project specifications (including Addenda) as described in the Project Submission Schedule (Annex A).

5.0 Internal Responsibilities

5.1 The Project Manager shall ensure that this policy is provided to the project consultants for incorporation in the construction documents and specifications/tender documents.

5.2 The Project Manager shall receive the close-out documentation from the consultants and/or contractor. The Project Manager shall make every effort to ensure that this documentation is received in a timely manner so as not to delay the full and proper operation of the facility.

5.3 The Project Manager will provide the close-out documentation to the Real Property Asset Management Coordinator who will verify it's compliance with this policy. The Real Property Asset Management Coordinator will ensure that:

5.3.1 both the electronic and hardcopy information is filed in accordance with Facilities Management procedures,

5.3.2 the Facility Floor Plans and University Site Plan are updated if required due to changes to existing wall configuration or the construction of new facilities,

5.3.3 appropriate Facilities Management staff are notified of the receipt of this information in order to update the relevant databases (e.g. preventative maintenance, snow removal, floor areas, doors, keying, etc.).

6.0 **References.**

6.1 Ontario Association of Architects Practice Bulletin B.14 “Record Drawings”

Annexes

Annex A Project Submission Schedule

PROJECT SUBMISSION SCHEDULE

Project Name	
Estimated Construction Start Date	
Estimated Construction Completion Date	

Submission for:	When Required	Information Required	File Format	Size	Notes	Approx. Submission Date	Date Received
A - Room and Door Number Assignment by Facilities Management	Prior to end of 100% design development (Brock Assignments must be indicated on the "Issued for Tender" set)	- Floor Plans - Architectural (All Levels) - Roof Plan - Architectural	PDF	11" x 17"			
B - Contract Document Set for Facilities Management record		All disciplines - 1 set Drawings - bound - 1 set Specifications - bound	Hard copy	18" x 24"			
C - Used by Facilities Management for Auto CAD Configuration, Database Link	1 month after start of construction	**Submissions C & D** - Floor Plans - Architectural (All Levels) - Roof Plan - Architectural - Site Plan - Architectural - Site Plans - Mechanical, Electrical, Civil	PDF & DWG + Xrefs bound	24" x 36" preferred	**Notes for Submissions C and D** - Current Auto CAD file conditions as they exist on consultant computer - Changes must be incorporated to CAD files during construction and therefore should be suitable for update purposes		
D - Used by Facilities Management for Auto CAD Configuration, Database Link and Keying Process	2 months prior to construction completion (ensures construction changes have been updated)						
E - Final Revision Set Project Close-Out for Facilities Management record	Maximum time of 2 months after Project Close-Out	All disciplines - 2 sets Drawings - do not bind - 2 sets Specifications including all Addenda - bound	Hardcopy	24" x 36" preferred	**Notes for Submission E** - 1 PDF per drawing - PDF has correct orientation - PDF is black and white (shades of grey) including title block & company logos - PDF is flat - created without retaining layer structure - PDF is not locked in any way (files will be renamed by Facilities Management for file protocol)		
		- All Drawings, as noted above (separate PDF file for each hardcopy) - Specifications, and all Addenda (one PDF file per discipline)	PDF on CD & DWG + Xrefs bound on CD	24" x 36" preferred			
		- Drawing List of PDF file submission - 4 columns - Drawing Number, Drawing Title, Revision, File Name	Excel Application on CD	8½" x 11"			
		- Maintenance Manuals		8½" x 11"			

FMOP 5-2 -ANNEX A - AS BUILT SUBMISSION E – (ELECTRONIC AS BUILTS) SUMMARY SHEET

As-Built drawing in PDF file format

- Provide 1 PDF for every drawing listed in the drawing list
- PDF has correct orientation when opened
- PDF is black and white (shades of grey)including title block & company logos
    - unless colour required to convey information graphically
- PDF is flat - created without retaining AutoCAD layer structure
- PDF is not locked in any way (PDF File Names will be revised if required)

PDF File Names

- Building Acronym - Construction Year - Drawing # - Revision # - Company Project File #
- South Block Example - STH-2012-A1-RAB-38-2012
  RAB (Revision As-Built)

  Building Acronyms can be found at http://brocku.ca/facilitiesmgmt/IMAGES/Building%20Names%20&%20Codes.pdf

Drawing List of all drawings submitted in PDF file format (the only way to know if the complete set has been received)

- Excel Application with 4 columns
- Drawing # - Drawing Name – Revision - File Name

Example

BUILDING NAME & RENOVATION YEAR			
DRAWING #	**DRAWING NAME (AS PER DRAWING)**	**REVISION**	**FILE NAME**
ARCHITECTURAL			
A1	FLOOR PLAN	AS BUILT	STH-2012-A1-RAB-38-2012
A2	ROOF PLAN	AS BUILT	STH-2012-A2-RAB-38-2012
A3	EXTERIOR ELEVATONS	AS BUILT	STH-2012-A3-RAB-38-2012
A4	BUILDING SECTIONS	AS BUILT	STH-2012-A4-RAB-38-2012
A5	DETAILS	AS BUILT	STH-2012-A5-RAB-38-2012
A6	REFLECTED CEILING PLAN	AS BUILT	STH-2012-A6-RAB-38-2012
A7	ROOM AND DOOR FINISH SCHEDULE	AS BUILT	STH-2012-A7-RAB-38-2012
ELECTRICAL			
E1	DRAWING TITLE	AS BUILT	STH-2012-E1-RAB-38-2012
E2	DRAWING TITLE	AS BUILT	STH-2012-E2-RAB-38-2012
E3	DRAWING TITLE	AS BUILT	STH-2012-E3-RAB-38-2012
E4	DRAWING TITLE	AS BUILT	STH-2012-E4-RAB-38-2012
MECHANICAL			
M1	DRAWING TITLE	AS BUILT	STH-2012-M1-RAB-38-2012
M2	DRAWING TITLE	AS BUILT	STH-2012-M2-RAB-38-2012
M3	DRAWING TITLE	AS BUILT	STH-2012-M3-RAB-38-2012

Further information regarding drawing submission can be found on the FM website at the links below:

FMOP 5-2 - Facility Management Web Site Links (for more information)

- Construction Document Setup and Project Submission Requirements - http://www.brocku.ca/webfm_send/210
- Annex A - http://www.brocku.ca/webfm_send/6842