



Capital and Engineering Project Closeout & Construction Documentation Requirements

Guidelines for Architects, Contractors, and Project Managers

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CAD DRAWING PRODUCTION

1 FILE FORMAT and SETUP

1.1 Electronic File Format

- 1.1.1 As-built construction project drawings must be submitted to HHS in full compliance with the most recent or prior version of AutoCAD® software at the time of submission (file extension = .DWG).
- 1.1.2 AutoCAD® drawings from all disciplines shall be provided for every submission.
- 1.1.3 A complete list of drawings shall be supplied to HHS on either company letterhead or using the original design drawing legend and submitting that drawing as part of that company's as build submission
- 1.1.4 The AutoCAD® file name shall be less than **20 characters** including dashes, spaces and underscores
- 1.1.5 Contractor as builds shall use existing design drawing numbering. Mechanical or electrical drawings that require to be broken out into more specific disciplines, those drawings shall use the existing design drawing number with the additional information at the end of the drawing number. For example, M-213 design drawing consists of domestic water systems, medical gas, and sanitary systems, the drawing shall be broken down M-213_medgas, M-213_plumb, M-213_san, etc.
- 1.1.6 The company .CTB file shall be included with the submission of the AutoCAD® drawings if one is used.(the .CTB file is used to print the drawings to the companies standards, line weight, etc)
- 1.1.7 The AutoCAD® file size shall be **20MB (20,000 KB)** or less.

1.2 Scale, Unit, and Tolerances

All AutoCAD® drawing models should be drafted at full scale in architectural or metric units, and shall be noted in the title block, view port, or detailed view. Tolerances for construction drawings are implicit within professional service contracts.

1.3 Fonts & Text Styles

Text styles and fonts may vary, but the use of font ROMANS.shx for most applications is desirable. Special fonts which are not packaged with AutoCAD® are **not** allowed. Dimensions, labels and notes, should be not less than 2mm or 5/64" in height on printed drawings

1.4 Blocks

HHS is currently not imposing the use of any particular block definitions or block libraries. However, HHS requires that the following general rules be employed when handling block entities:

1. All entities within a block must be created on layer 0.
2. Drawing entities translated into blocks from non-AutoCAD® systems must revert to layer 0 when exploded.
3. File translation from other systems which result in wall blocks within the .DWG file are unacceptable.

1.5 Title Blocks

Each AutoCAD® file submitted to HHS should have only one title block. If using paper space, the title block should be placed with its lower left hand corner point inserted at a coordinate location of (0,0,0). Depending on the purpose of the drawing, facility documentation or construction, the drawing's title block should contain certain essential information that HHS needs to store and retrieve drawings in its library. Title blocks for construction drawings, consulting architects, and engineers must use the HHS title block template or a modified version provided by your HHS representative.

At minimum, these title blocks should contain all of the information listed below.

- HHS Logo, (please refer to 1.7 policy on image files (JPGs, BMPs, PNGs))

Project Information:

- Firm Name - representing the drawing author
- Project Name - as specified by HHS
- Building Number - as specified by HHS
- Building Name - specify only if the project name does not include this information already, and the project is building specific
- Project Number - as specified by HHS

Sheet Information:

- Drawing Title - indicating the drawing content, e.g. floor plan, section, detail, etc.
- Drawing Number - sheet identification shall be consistent throughout the entire set of drawings for all disciplines, e.g. (A-100, E-100, M-100, S-100).
- Date of Drawing - date of final revision of the record drawing
- Drawing Scale - representing the intended plot scale of the drawing with title block
- North Arrow

1.6 Policy on External Reference Files (XREFs)

- 1.6.1 HHS will **not** accept the submission of any AutoCAD® drawing deliverable which contains unbound references to external source drawing files. All externally referenced data sources that were used during the AutoCAD® drawing production phase should be inserted and retained as a block within a single drawing file, including the title block, upon project completion and prior to drawing delivery to HHS. The resulting self-contained drawing file is an acceptable deliverable to HHS.
- 1.6.2 Drawings submitted with backgrounds, external references, floor plans, or title blocks missing will be **rejected**.
- 1.6.3 Drawings submitted with backgrounds, external references, floor plans, or title blocks requiring re-path will be **rejected**.
- 1.6.4 E-transmitting is an acceptable method for binding drawings.

1.7 Policy on Image Files (JPGs, BMPs, PNGs)

HHS will **not** accept the submission of referenced images either. All images included in a drawing must be cut and pasted into the drawing so that they are embedded within the AutoCAD® file. Referenced images will be discarded and therefore might cause incomplete drawings. Please be aware of this when creating your AutoCAD® files. If it is not possible to embed the images please contact HHS project manager to determine an alternative.

1.8 Policy on Model Space and Paper Layout Space

HHS requires that each AutoCAD® file submitted as a project deliverable contains only one drawing model with one title block, using either of the following setup methods. Note that some HHS clients may express a preference for one method to be used instead of another. In this case, please see your HHS client representative for specific preferences.

PREFERRED: Method #1 -- Model Space and Paper Space Combined. Each AutoCAD® file is set up to contain only one title block in paper space which references the building model contained in model space.

Method #2 -- Model Space Only. Both the drawing model and title block are contained in the same model space environment within a single AutoCAD® file. The paper space environment is not used.

2 LAYERING

2.1 Layering Standard

While HHS preferred AutoCAD® layering system is the American Institute for Architecture (AIA), All variation of this and other industry and company standards are acceptable, however where large quantities of data are inappropriately layered, drawings may be **rejected**. AutoCAD® layering shall represent the proper discipline or system it is relating to.

3 POLICY on CAD FILE TRANSLATION

3.1 Error-free AutoCAD® Drawing Deliverables

HHS recognizes that many of its construction firms do not use the same version of AutoCAD®. However, HHS expects that service providers who work with other file formats will submit .DWG formatted AutoCAD® files upon project closeout that are fully compliant with all of the standards outlined herein. Also, these files shall have no significant loss of drawing entities or project data that can result from standard AutoCAD® file translation procedures. All .DWG files and AutoCAD® drawing entities submitted at the end of a project must be able to be manipulated using standard AutoCAD® drafting procedures. Non-compliance with this policy may result in the rejection of AutoCAD® files submitted at project closeout in addition to delayed rendering of the final project payment. DXF files will not be accepted at project closeout as a substitution for DWG AutoCAD® file deliverables.

3.2 Translation Testing Recommended

For firms translating their native CAD file format into AutoCAD® .DWG format concerned about delivering error-free AutoCAD® files to HHS upon project closeout, it is strongly recommended that thorough file translation testing be conducted **before** the drawing development phase of the project. This will assure early detection of file conversion issues, if any, and allow for corrective measures to be taken before the project closeout period.

3.3 Revit Submissions and Conversions

Where Revit® and Revit MEP® are used, those files from all disciplines shall be provided for every submission. Revit files shall be printed to PDF with the files also being exported to AutoCAD® for HHS use as per policy 3.1 noted above

4 POLICY on PRINTING AND SUBMITTING DRAWINGS

4.1 Hard Copy Drawing Deliverables

A minimum of one full size set and one half size set of documents printed on 20lbs bond paper shall be submitted to HHS at every submission.

4.2 PDF (Portable Document Format) Drawing Deliverables

PDF drawings from all disciplines shall be provided for every submission. The drawings shall be printed using the appropriate .CTB file in AutoCAD®, and the drawings shall retain all of the proper line weights, line types, hatch patterns, and drawing information. Drawings scanned to PDF from hardcopies will only be accepted in addition to printed PDF's

4.3 Contractor As Build Drawing Deliverables

Contractors are to supply all as build drawings in there submission in AutoCAD, PDF and hardcopy following all of the policies noted above.

4.4 Shop Drawing Deliverables

Contractors or construction companies who construct specialty items will submit in AutoCAD, PDF and hardcopy following all of the policies noted above.

5 POLICIES on OPERATION and MAINTENANCE MANUALS, HYDRONIC TESTING, BALANCING REPORTS, and WARRANTIES

5.1 Operation and Maintenance Manual Deliverables

5.1.1 A list of expected Operation and Maintenance Manuals shall be supplied prior to construction. The list shall contain the contact information of the individual responsible for each portion of the handover documentation. Hand over documents shall be supplied in both hardcopy and PDF format.

5.1.2 Operating procedures shall be submitted for each device supplied within the project. Each item shall be identified with an equipment tag that represents it's integration into our existing hospitals network of services (e.g. pump P-1, fans, AHU's) and shall outline safety procedures and safe operation of the device.

5.1.3 Each item shall be supplied in hardcopy within the Operation and Maintenance Manual, and supplied as an individual PDF labeled with an equipment tag.

5.2 Hydronic Testing and Balancing Report Deliverables

Hand over documents shall be supplied in both hardcopy and PDF format.

5.3 Hardware and Equipment Manuals

A list of expected hardware and equipment shall be supplied prior to construction. The list shall contain the contact information of the individual responsible for each portion of the handover documentation. Hand over documents shall be supplied in both hardcopy and PDF format.

5.4 Warranties

A list of expected warranties shall be supplied prior to construction. The list shall contain the contact information of the individual responsible for each portion of the handover documentation. Hand over documents shall be supplied in both hardcopy and PDF format.