



RIT CAD Specifications

The design team shall provide RIT with Revit, AutoCAD, and PDF files that capture the construction conditions of the associated project. This document outlines requirements for submitting project information to RIT.

PART A – REQUIRED DOCUMENTATION

SECTION A1: REVIT

Revit models are required on all construction projects (new, additions, alterations) with a total project funding of \$2,000,000 or greater.

1. The final Revit files used in the Design Services phase of a building project, including up-to-date revisions and modifications, shall be transmitted to RIT according to the schedule in Section A5. The files shall not be password protected. Include all Building Information Modeling (BIM) and trade (MECH, ELEC, PLBG, etc.) files. In addition, create and submit a combined final Revit building model that links all trade components. The Revit files will be utilized by RIT staff for reference and building maintenance. The Architect of Record holds all the copyrights; RIT makes no claim to proprietary information contained within the files.
2. All models must be drawn using at least Revit 2015 version; any models created using an earlier version will not be accepted. Files shall be .rvt file extension and accompanied by a version of the drawing in AutoCAD (see section A2).
3. Revit models shall be created to include all geometry, physical characteristics, and product data needed to accurately represent the design and construction work of a project. Drawing sheets, schedules, simulations, and services required for assessment, review, bidding, and construction shall be extractions from this model.
4. Any use of Revit translation software must result in 100% compatibility with the RIT computer hardware and software.
5. All drawings must use the RIT title border.
6. When a drawing file is complete, purge all unused items before submitting.

SECTION A2: AUTOCAD

AutoCAD drawings are required on all construction projects (new, additions, alterations) with a total project funding of \$500,000 or greater.

1. All final AutoCAD files used in the Design Services phase of a building project, including all up-to-date revisions and modifications, shall be transmitted to RIT according to the schedule in Section A5. The files shall not be password protected. Include all trade (MECH, ELEC, PLBG, etc.) components and files. The AutoCAD files will be utilized by RIT staff for reference and building maintenance. The Architect of Record holds all the copyrights; RIT makes no claim to proprietary information contained within the files.
2. All models must be drawn using at least AutoCAD 2013 version; any models created using an earlier version will not be accepted. Files shall be .dwg file extension and accompanied by a version of the drawing in Revit if applicable (see section A1).
3. AutoCAD files shall be created to include all geometry, physical characteristics, and product data needed to accurately represent the design and construction work of a project. Drawing sheets and schedules shall be extractions from this file.
4. Any use of AutoCAD translation software must result in 100% compatibility with the RIT computer hardware and software.
5. AutoCAD standards shall be based on Version 3.1 of the National CAD Standard. It is comprised of the National CAD Standard and specific requirements from RIT. See www.nationalcadstandard.org.
6. All drawings must use the RIT title border.
7. When a drawing file is complete and ready for submittal, apply the following settings:
 - a. Convert all 3D objects to 2D. All linework should be at elevation 0'-0".
 - b. Use the "PURGE" command to un-reference from the drawing all unused objects (blocks, dimstyles, layers, linetypes, shapes, materials, styles, etc.).
 - c. Turn off "SNAP" and "GRID".
 - d. Change the background color to BLACK.
 - e. Name the Layout tabs as intended for printing using drawing designators outlined in Section B1.
 - f. "BIND" all Xref files to the drawing files on the 0 – XREF layer.

SECTION A3: PDF

PDF files are required on all construction projects (new, additions, alterations) with a total project funding of \$500,000 or greater. The files shall be up-to-date with revisions and represent the final construction conditions of the project.

1. PDF files used in the Design Services phase of a building project shall be transmitted to RIT according to the schedule in Section A5. The files shall not be password protected. Include all Building Information Modeling (BIM) and trade (MECH, ELEC, PLBG, etc.) components. The files will be utilized by RIT staff for reference and building maintenance. The Architect of Record holds all the copyrights; RIT makes no claim to proprietary information contained within the files.
2. The PDF files shall be created as a plot to pdf from the Revit model or AutoCAD drawing, scaled appropriately on ARCH D size media. Include all geometry, physical characteristics, and product data needed to describe the design and construction work of a project.
3. All drawings must be on the RIT title border.
4. Each construction drawing shall be its own unique file, named using [Discipline & Stage] - [Sheet Title]
 - a. Example: A101 – First Floor Plan

SECTION A4: SUBMITTAL REQUIREMENTS / QUALITY ASSURANCE

1. Architect/Engineer must submit one copy of all project-related Revit and AutoCAD drawing files on CD ROM, along with electronic PDF files of all record and “as-built” drawings. Drawings must follow conventions and guidelines outlined in this specification.
2. Consultant shall submit a list, using Microsoft Word (.doc) or Microsoft Excel (.xls), of all documents included in the submittal package, including drawing numbers, titles, and file names. The consultant is responsible for including any copyright information or restrictions pertaining to these documents.
3. Naming requirements, described in Part B of this document, are to be used for all drawing files.

SECTION A5: SCHEDULE FOR REQUIRED DOCUMENTATION

1. Schematic Design
 - a. PDF files
2. Design Development
 - a. PDF files
3. Construction Documents
 - a. Complete Issued for Bid PDF files (issued to RIT for review two weeks prior to drawing being released to CM for bid; final set is to incorporate RIT comments)
 - b. Floor plan CAD files
4. Bidding
 - a. PDF files due on bid date
5. Construction Administration
 - a. Prior to work commencement:
 - i. Complete Issued for Construction PDF files
 - ii. Revit/CAD models to be shared with construction team for coordination and clash detection
 - b. Beginning of closeout process:
 - i. Complete and final Revit/CAD models due at beginning of project closeout process
 - ii. Complete As-Built PDF files due at beginning of project closeout process

SECTION A6: SPACE – DEFINING ROOM NUMBERS, BOUNDARY PLACEMENT (ZONE POLYLINE)

1. Gross – the gross area of a building is the sum of the areas at each floor level included within the principal outside faces of exterior walls, provision to be made for architectural setbacks or projections. Include all stories of areas with floor surfaces with clear standing head room regardless of their use. Where a ground level or intermediate story, or part thereof, is left unenclosed, consider the gross area of the unenclosed story as the projected area of the story above. Exclude all unroofed areas and unenclosed roofed-over spaces. Each architectural floor plan will have a closed polyline outlining this area. This information will only change over the life of the building if there is a brick and mortar addition or demolition.
2. Core – core (non-assignable) spaces are areas of a building which service the building(s) operation rather than the tenant. The core space of a building will normally not change its function over the life of the building or depend on the tenant occupying the building. Core space will include major vertical penetrations such as stairs, elevator shafts, flues, pipe shafts,

vertical ducts and their enclosing walls. Examples of core areas include public restrooms, janitorial closets containing plumbing, electrical transformer rooms, and mechanical rooms containing building heating, ventilation, and air conditioning equipment, telecommunications and computer networking rooms, that service the building. Note: administrative offices in core space such as a boiler room operator office or desk area in a telephone room should be considered core space, but are NOT non-unassignable. Enclosed areas such as columns and mechanical shafts will be individually defined and measured with a polyline zone. The measurement of core area includes the space from the outside finished surface of the enclosing permanent walls. The appropriate person at RIT will determine if these spaces are to have room numbers. Contact the Space Inventory Coordinator's office.

- a. These areas will be defined in a lump sum sq. ft. number by floor. Open space (such as atriums) will be defined according to the RIT standard.
- b. Total core area will be defined in a single record per floor with a lump sum square footage.
3. Circulation – space required for physical access to some subdivision of space whether directly bounded by partitions or not; includes corridors, elevators, lobbies, and interior stairs. Limitations: only horizontal spaces required for general access are included, not aisles used only for circulation within office suites, auditoriums, or other work areas. Do not deduct building columns or projections.
4. Under normal conditions, the boundary (zone) line is to reflect conditions that exist 4'-0" above finished floor.
 - a. If an enclosed space is located between a room and a corridor (such as a pipe chase), it is not included in any room but treated as a wall.
 - b. For small enclosures built against the exterior wall, place line on the interior face of the exterior wall.
 - c. Mechanical equipment and related piping and ductwork located inside walls will not be considered when locating polylines.
 - d. Space blocks (zone polylines) for corridors will be divided into definitive areas, such as major intersections, at fire doors, etc. These blocks will also be assigned a unique room number by RIT and included in the list of Room Numbers, Names, Sq. Ft. as part of the project package.
 - e. If a wall has been removed, making two rooms into one, the space is to be incorporated into the primary room, unless the main point of access to the room has changed.
5. Core and Circulation areas are to be separate polylines. For the purpose of this section, "assignable space" is used to denote any space that is not core or circulation space.
6. The area of each polyline will be recorded in the Net Area section of the Room Information Block. Architectural floor plans that do not include this information will not be accepted as either Design, Contract, or As-Built documents by RIT.
7. A polyline will be drawn to the inner surface of the exterior wall or window glass. The zone line will be placed on the dominant interior face of the exterior wall and party walls, regardless of thickness or material type, and will be placed so as to maximize useable square footage. Do not include the room net floor area occupied by room heating units (radiators), custom-built furniture such as room length permanent bookcases, etc.
8. All polylines shall be placed on their own layer, named 'ED1 Space Polygons'. Color to be 3-Green.
9. All polylines must be closed using the "close" command to finish the polyline.

SECTION A7: ARCHITECTURAL DRAWING CONTENT

Each architectural and interiors facilities drawings set will include, but is not limited to

1. Wall and partition information, including all permanent and demountable walls, fire ratings, and fire wall locations.
2. Floor information including load rating
3. Reflected ceiling information including ceiling grid height above finished floor
4. Area polylines indicative of the gross area/footprint of the building/floor
5. Area polylines indicative of the Net Square Footage of every internal space in the building
6. Area specific information including room number, room name, net area in the format specified and provided by RIT.

SECTION A8: STRUCTURAL DRAWING CONTENT

Each structural drawing will include, but is not limited to

1. Foundations and footings including piling; indicate outline dimensions, pile depths, type
2. Slabs, indicate capacity, metal deck, reinforcing, load capacity, depressions, slab thickness
3. Soil boring reports

SECTION A9: ELECTRICAL DRAWING CONTENT

Electrical drawings will include, but are not limited to

1. Security systems shall have dedicated drawings, including motion sensors, door sensors/switches, door lock releases, key card readers, central stations, with zones indicated.
2. Access systems shall have dedicated drawings, including motion sensors, door sensors/switches, door lock releases, key card readers, central stations, with zones indicated.

SECTION A10: FIRE PROTECTION DRAWING CONTENT

Fire Protection Drawings will include, but are not limited to

1. Fire alarm systems shall have dedicated drawings.
2. Sprinkler systems shall have dedicated drawings.
3. Special fire systems shall have dedicated drawings (halon, foam, other); indicate system type, area served, component locations, discharge nozzles, detectors, connections to alarm/power/HVAC.

END OF PART A

PART B – TECHNICAL INFORMATION

Note: For projects that do not fit these specific formats, consult the Manager of Planning and Design Services.

SECTION B1: NUMBERING/NAMING CONVENTIONS & DESIGNATORS

Reference UDS Module #1

1. Project Folder Naming Convention
 - a. Format: RIT – Bldg # – Project Phase – Floor(s) – Year – Project Description – RIT Project #
 - b. Example: RIT-001-DES-01-2005-HR Renov-123456
 - c. Building numbers can be obtained from the RIT Space Inventory Coordinator
 - d. Floor indicators include numbers 01-12; A or B = Basement; R = Roof
 - e. Project Phases include PRE = Preliminary; DES = Design (contract docs); ASB = As-Built
2. File Naming Convention for Single Drawing Files
 - a. Format: Bldg # – RIT Project # - Discipline Designator
 - b. Example: 001-123456-MECH
3. File Naming Convention for Multiple Drawing Files
 - a. Format: Bldg# - RIT Project # - Discipline & Stage – Sheet Name
 - b. Example: 001-123456-A101-First Floor Plan
4. Drawing Sheet/Layout Tab Naming Convention (for use in Revit/AutoCAD)
 - a. Format: Discipline & Stage – Revision Status
 - b. Example: A101-R1
5. Sheet Numbering Convention
 - a. Format: Discipline & Stage – Revision Status (if necessary)
 - b. Example: AD102-R1, for Architectural Demo Plan Drawing 2 – Revision 1
 - c. Sheet Sequence: Drawing numbers are comprised of their discipline designator, sheet type designators plus the sequence number
6. ZIP files of Contract or As-Built Documents Naming Convention
 - a. Format: Bldg # – Floor(s) – RIT Project #
 - b. Example: 09-01-123456
7. Discipline Designators (Reference UDS-01.15)

A – Architectural	L – Landscape	X – Other	C – Civil
M – Mechanical	Z – Contractor/Shop	E – Electrical	P – Plumbing
F – Fire Protection	Q – Equipment	G – Genera	R – Resource
H – Hazardous Material	S – Structural	I – Interiors	T – Telecommunications
FS – Food Service			
8. Sheet Type Designators

0 – General: Symbol Legend, Abbreviations, General Notes	5 – Details
1 – Plans	6 – Schedules & Diagrams
2 – Elevations	7 – User Defined
3 – Sections	8 – User Defined
4 – Large Scale Drawings (not details)	9 – 3D Drawings

9. Supplemental Type Designators

R – Revised floor plan (used with revision number, e.g. R1 or R2)

X – Totally revised floor plan

A – First phase of a multi-phased construction project (B = Phase 2, etc.)

RD – Record Drawing

AB – As-Built

SECTION B2: DRAWING SHEET SIZE, SCALE, FORMAT, TITLE BORDER

1. Floor plans shall not be less than 1/8" = 1'-0". All final drawings shall conform to 24" x 36" plot size.
2. Title Border: All drawings shall use the RIT Title Border file available at the FMS website, <https://www.rit.edu/fa/facilities/content/vendorcontractor-information>

SECTION B3: DRAWING ACCURACY AND CONSISTENCY

1. The "0,0,0" coordinate is used as the prime reference point for connecting various drawing sections together, as well as merging drawings from various disciplines. Do not change the drawing's base insertion point.
2. Refer to UDS Module 5 for abbreviation standards.

SECTION B4: LAYERS

1. The layering of drawings must always match the standard specified. The Layer Convention utilizes the NCS Standard (AIA CAD Layer Standard). Variations from or additions to the NCS Standard will be documented for and approved by RIT.
2. No drawing objects will be stored on layer '0' (zero) or layer 'Defpoints'.
3. All blocks will be created and inserted on a layer specific to that block.
4. Prefix classifications will adhere to the National CAD Standard.

SECTION B5: LINEWEIGHTS, LINETYPES, COLORS

1. Drawings must be plotted using the RIT CTB(s), available at the FMS website, <https://www.rit.edu/fa/facilities/content/vendorcontractor-information>

SECTION B6: LETTERING

1. To maintain readability and consistency, text must be at least 1/8" high, using AutoCAD provided fonts only.

SECTION B7: SYMBOLS

1. Refer to Module 6 of the UDS for Standard Reference Symbols.
2. Insert symbols on the proper layers.
3. Size designator symbols in relation to the drawing plot scale. When plotting at 1/8" = 1'-0", the symbol insertion scale factor would be 96.
4. Fill in any attribute fields that are included in the symbols.
5. Do not mirror blocks.
6. Temporary blocks used in drawing creation should be exploded and purged out of the drawing. This includes entities that are copied/pasted within or between drawing files.

END OF PART B