Section D7060
UCB OIT CAD Requirements

D7060 – Subsections:

D7060 - Introduction

The purpose of this document is to serve as a tight specification for producing and delivering CAD drawings for facility documentation projects and construction projects. The guidelines are intended to ensure the successful use and control of CAD systems and data throughout the UCB OIT Telecom CAD Dept.

Before a project can be closed out and final payment from the UCB OIT Telecom Dept. rendered, all specified materials must be submitted to the appropriate UCB OIT Telecom CAD Dept. project manager or representative in accordance with production standards and special instructions described throughout this document.

A signed copy of the CAD Quality Assurance Checklist found in section D7060.12 - 7. of this document must also be submitted with CAD drawings being delivered during the closeout phase of projects. When a CAD Quality Assurance Checklist has been signed and submitted, the vendor (architect, engineer, contractor, etc.) is assuring that all materials adhere to the standards and guidelines set forth in this document.

The layering standard outlined herein is a slightly modified version of the 1997 American Institute of Architects CAD Layer Guidelines. However, please note that the UCB OIT Telecom CAD Dept. follows its own guidelines for naming and organizing CAD files, instead of following the 1997 AIA recommendations in these areas.

The UCB OIT Telecom Division Standards mentioned in this document are included with the UCB Facilities Standards found at https://www.colorado.edu/facilities-standards/.

Please direct any questions or comments about this document to the UCB OIT Telecom CAD Dept. client representative at the address below.

University of Colorado at Boulder
OIT Telecom, CAD Dept.
3645 Marine St., 455 UCB
Boulder, CO 80309-0455

Attn:
OIT – CAD Department
CAD Staff, Engineering
Telephone: 303-735-2675
Telephone: 303-735-6300

D7060.11 – CAD Drawing Production File Format and Setup

1. Files Provided by UCB OIT CAD Department
    a. Consultants shall contact the UCB OIT Telecom CAD Dept. at the beginning of the project to be provided with a Zip file containing all necessary AutoCAD blocks, LISP files, Script Files, base drawings, building numbers and codes, etc.
2. Electronic File Format
    a. Facility documentation drawings and construction project drawings must be submitted to the UCB OIT Telecom CAD Dept. in full compliance with AutoCAD software (file extension = .DWG). The following AutoCAD file formats are acceptable:
        i. AutoCAD 2013* or newer – DWG format only

    *Due to AutoCAD issues the UCB OIT CAD Dept. must save drawings to version 2013 or newer and previous versions will not coincide with information provided by OIT.
3. Scale and Units
    a. All CAD drawing models should be drafted to scale at full scale.
    b. Imperial (Architectural in AutoCAD) units shall be the standard system of measurement (exception: Decimal for OSP).
    c. The base unit shall be inches (exception: feet for OSP).
4. Tolerances
    a. For Facility Documentation Drawings
        i. Typically it is required that exterior building dimensions recorded within CAD drawings must reconcile to within 1 inch of actual building dimensions as measured in the field, and interior building dimensions must reconcile to within 1/2 inch of actual field dimensions. However, individual project specifications may vary. Please confirm dimension error tolerances for each project with your UCB OIT Telecom CAD Dept. client representative.
    b. For Construction Drawings
        i. Tolerances for construction drawings are implicit within professional service contracts.
5. Text
    a. All non-attributed text on UCB OIT Telecom CAD Dept. CAD drawings shall be created using only the Mtext command.
    b. All text on UCB OIT Telecom CAD Dept. CAD drawings shall use only the ROMANS font supplied with AutoCAD's font library. The CAD files submitted shall be plotable without modification.
    c. Text size must be legible and appropriate to the graphic information presented and the intended plotted scale of the drawing. Text must be in all upper case letters throughout a drawing.
        i. Refer to Appendix **D7060.111** for Dimscale Chart for UCB OIT Telecom CAD Dept.
    d. Text usually should not touch other graphic objects, and must be placed with enough space around it to be legible when the drawing is plotted and reproduced.
    e. Text may be placed at an angle. It must be readable from the bottom or right edges of the plotted sheet. Generally text should be placed at an angle of 0° or 90°. Text may be placed along (above or below) another element at an angle other than 0° or 90°.
    f. Dimensions, labels, notes and drawing titles, when requested as part of the project, shall match existing height on printed drawings.
6. Blocks
    a. The UCB OIT Telecom CAD Dept. is currently requiring the use of block definitions provided by this department (See Section D7060.11 – 1..). However, when additional blocks must be created, the UCB OIT Telecom CAD Dept. requires that the following general rules be employed:

i. All entities within a block must be created on layer 0
ii. Block attributes must not be set to annotative

b. Block definitions provided by UCB OIT Telecom shall not have attributes added to or removed from them.

7. Title Blocks
   a. Each CAD file submitted to the UCB OIT Telecom CAD Dept. should have only one title block. The title block should be placed in paper space, with its insertion point inserted at a coordinate location of (0,0,0), and at a scale of 1. The cut size of the paper should be 24"x36". Depending on the purpose of the drawing, facility documentation or construction, the drawing's title block should contain certain essential information that the UCB OIT Telecom CAD Dept. needs, to store and retrieve each drawing in its library.
   b. Title Blocks for Facility Documentation Drawings
      i. A generic UCB OIT Telecom CAD Dept. title block template is available for use.
   c. Title Blocks for Construction Drawings
      i. Consulting architects and engineers may use their own title blocks. At minimum, these title blocks should contain all of the information listed below.
   d. Project Information
      i. Firm Name - representing the drawing author
      ii. Project Name - as specified by the UCB OIT Telecom CAD Dept.
      iii. Building Number - as specified by the UCB OIT Telecom CAD Dept.
      iv. Building Name - specify only if the project name does not include this information already, and the project is building specific
      v. Project Number - assigned by the UCB OIT Telecom CAD Dept.
   e. Drawing Information
      i. Drawing Title - indicating the drawing content, e.g. floor plan, section, detail, etc.
      ii. Drawing Number
      iii. Date of Drawing - original drawing date including significant revision dates
      iv. Drawing Scale - representing the intended plot scale of the drawing with title block
      v. North Arrow
      vi. Electronic File Name
8. Model Space and Paper Space
   a. The UCB OIT Telecom CAD Dept. requires that each CAD file submitted as a project deliverable contain only one title block in paper space which references the building model contained in model space. Additional models related to the same building are allowed and shall be shown through the use of multiple viewports in paperspace.
   b. In addition:
      i. Label scaled details with the appropriate scale on the detail title in model space.
      ii. Show detail through viewport zoomed to the appropriate scale in paper space.
      iii. Do not place or draw model-related blocks, tags and objects in paper space.
      iv. Draw all model space objects at full scale, and to scale.
9. External Reference Files (Xrefs)
   a. The UCB OIT Telecom CAD Dept. will not accept the submission of any CAD drawing deliverable which contains references to external source drawing files created outside of the UCB OIT Telecom CAD Dept. All externally referenced data sources that were used during the CAD drawing production phase, unless created by the UCB OIT Telecom CAD Dept., 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 the UCB OIT Telecom CAD Dept. External references shall not be “bound” to drawings. The resulting self-contained drawing file is an acceptable deliverable to the UCB OIT Telecom CAD Dept.

10. Drawing Composition
    a. All AutoCAD drawings shall be purged of empty, unused, or non-essential drawing data prior to submittal to The UCB OIT Telecom CAD Dept. This includes all unused layers, linetypes, blocks, fonts and entities.
    b. AutoCAD drawings shall not contain multiple overlaid lines or lines with multiple segments unless the overlaid lines or adjacent line segments are assigned to different layers.
    c. Blocks should not be exploded.
    d. Drawings should be left in paperspace and zoomed extents.
    e. The menu should be set to ACAD.
11. Annotation
    a. Annotation can be placed in either model space or paper space. Annotations related to model data, such as dimensions, notes, drawing titles, legends and callouts must be included in the model space where they are easier to coordinate and revise.
    b. Other annotations, such as sheet-specific notes, are more convenient to work with when placed on the drawing sheet in paper space.
    c. Leaders shall extend from the vertical midpoint of the top line of the annotation and point to the object being described. Leaders can extend from the right or left side of the annotation. Leaders shall be placed on the same layer as the annotation for the object.
12. Dimensions
    a. All dimensions shown in the project submittals shall be fully associative. Dimension definition points should be located with an appropriate Object Snap (End Point, Mid Point, etc.) or otherwise located precisely on the project geometry. Manual input of dimension text or otherwise over-riding the actual dimensions is NOT acceptable in submittals to the UCB OIT Telecom CAD Dept.
13. Layering
    a. The UCB OIT Telecom CAD Dept. has adopted most of the layer name and use rules recommended by the CAD Layer Guidelines published in 1997 by the American Institute of Architects (AIA CAD Layer Guidelines NCS Version 2). AIA recommendations, which have been adopted by the UCB OIT Telecom CAD Dept. are included in this section. Where noted, the UCB OIT Telecom CAD Dept. has supplemented the AIA guidelines with its own rules and standards, as necessary. A copy of the current National CAD Standards may be obtained from http://www.nationalcadstandard.org/ncs6/ .
    b. Standard Layer Listing

       This section contains a partial list of AIA recommended layers to be used when producing facility documentation drawings, construction drawings, fiber schematics and Outside Plant (OSP) drawings for the UCB OIT Telecom CAD Dept.
    c. Core Layer Attributes – Telecom Layers

Name	Sheets*	Description	Color	Linetype
T-ANNO-CATV	All	CATV Text	74	Continuous
T-ANNO-COND	All	Conduit Text	24	Continuous
T-ANNO-COPR	All	Cable Copper Text	142	Continuous
T-ANNO-DEMO	All	Demo Text	20	Continuous
T-ANNO-DIM	All	Dimensions	3-green	Continuous
T-ANNO-DIST	JK	Distance Arcs Text	12	Continuous
T-ANNO-ELEC	TS	Electrical Text	7	Continuous
T-ANNO-EMER	OSP	Emergency Phone Text	94	Continuous
T-ANNO-FA	TS, JK	Fire Alarm Text	12	Continuous

T-ANNO-FIBR	All	Cable Fiber Text	222	Continuous
T-ANNO-FR	JK	Fire Rating Text	22	Continuous
T-ANNO-GRID	OSP	Campus Grid Text	8	Continuous
T-ANNO-INDT	DET, MH	Innerduct Text	160	Continuous
T-ANNO-LEGN	All	Legends and Schedules	7-white	Continuous
T-ANNO-NOTE	All	Job Notes	140	Continuous
T-ANNO-NPLT	All	No-Plot Text, Viewports	7-white	Continuous
T-ANNO-RSTR	All	Text for Raster Images	7-white	Continuous
T-ANNO-SHAD	JK	Shaded Text	155	Continuous
T-ANNO-SYMB-TERM	TS, JK	Terminal Symbols	240	Continuous
T-ANNO-TEXT	All	General Text	3-green	Continuous
T-ANNO-TTLB	All	Border and Title Block	7-white	Continuous
T-BLDG-ELEM	All	Building Elements	7-white	Continuous
T-BLDG-OSP	OSP	Building Outline, OSP	7	Continuous
T-BLDG-OSP-DEMO	OSP	Buildings Demolished, OSP	20	Continuous
T-BLDG-TUNL	DET	Bldg Elements, Tunnels–Details	7-white	Phantom
T-CABL-CATV	TS, JK	Cable TV	3-green	Continuous
T-CABL-COPR	All	Copper Cable	140	Continuous
T-CABL-FA	TS, JK	Fire Alarm Cable	1	Continuous
T-CABL-FIBR	All	Fiber Cable	6-magenta	Continuous
T-CABL-INDT	DET, MH	Innerduct	5	Dashed
T-COND	All	Conduit , D-rings	40	Continuous
T-DIST	JK	Distance Arcs from Term	7	Dot
T-ELEC	TS	Electrical Outlets	7	Continuous
T-ELEC-GEN	TS	Electrical Outlets – Generator	90	Continuous
T-ELEC-UPS	TS	Electrical Outlets – UPS	220	Continuous
T-EQPM	TS	Equip, Electronics	104	Continuous
T-EQPM-CATV	TS, JK	Equip, CATV	112	Continuous
T-EQPM-COPR	TS	Copper Equipment	144	Continuous
T-EQPM-EMER	OSP	Emergency Phone	1	Continuous
T-EQPM-FA	TS, JK	Fire Alarm Equip	242	Continuous
T-EQPM-FIBR	TS	Fiber Equip	212	Continuous
T-FLOR-IDEN	JK	Room Numbers	7	Continuous
T-GRID	OSP	Campus Grid	8	Continuous
T-HAT-FR	JK	Fire Rating Hatch	10	Continuous
T-JACK	JK, OSP	Data/Telephone Jacks	240	Continuous
T-JACK-FIBR	All	Fiber Jacks	212	Continuous
T-JACK-????	JK	Alt-Owner Jacks (replace ???? with Owner Abbreviation)**	3 green	Continuous
T-MISC	All	Miscellaneous	7-white	Continuous
T-RACK-EQPM	TS	Equipment Rack	7-white	Continuous
T-RACK-LADR	TS	Ladder Rack	40	Continuous
T-RSTR	AS REQ.	Raster Images	7-white	Continuous
T-SCHM-BLDG	SCHM	Building Outline	4-cyan	Continuous
T-SCHM-FIBR	SCHM	Fiber	7-white	Continuous
T-SCHM-FIBR-EQPM	SCHM	Fiber Equipment	2-yellow	Continuous
T-SCHM-FIBR-FUTR	SCHM	Fiber - Future	7-white	Dashed
T-SCHM-FIBR-????	SCHM	Fiber - Alt-Owner	240	Continuous

		(replace ???? with Owner Abbreviation)**		
T-SHAD-1	JK	Shade (grayed back) layer	155	Phantom
T-TEMP	All	Temporary Information	165	Continuous
T-WALL-TEMP	All	Walls, partitions not FACMAN	1	Continuous
T-00-000	All	Project Layer***	150	Continuous
T-00-000-ALT	All	Project Layer – Alternate***	150	Hidden
T-00-000-TEXT	All	Project Layer - Text ***	152	Continuous

*Sheet Abbreviations
- All – All Drawing Types
- As Req. – As required
- DET – Detail Sheet
- JK – Jack Map
- MH – Manhole Drawing
- OSP – Outside Plant Drawing
- SCHM – Schematics (Fiber)
- TR – Terminal Sheets

** Owner Abbreviations for Alt-Owner Jacks/Fiber:
- ANET – Alliance Network
- CARD – Card Readers
- CATV – Cable TV
- FACM – Facilities Management
- QWST – QWEST
- RNET – Residential Network
- VCAM – Video Camera

*** Project layers are intended for revision clouds and notes pertaining to a particular project, designated by the project number in the layer name (Replace "0's" with project number). Drawing entities to be demolished may be placed on a project layer in lieu of a "demo" layer. New work shall be placed on layers with existing entities according to the entities being added. All new information, including line-work, shall be enclosed in a revision cloud drawn on the project layer. The project number shall be placed within the revision cloud on the project layer. All entities in a project layer will be deleted after the completion of a project.

d. Layer Name Formatting

As recommended by the 1997 AIA CAD Layer Guidelines, layer names may be as short as six characters (discipline code + major group) or as long as sixteen characters (discipline code + major group + minor group + status). Here are four examples of acceptable formula variations:

# 1	T-COND	= discipline code + major group
# 2	T-CABL-FIBR	= discipline code + major group + minor group
# 3	T-SCHM-FUTR	= discipline code + major group + status code
# 4	T-SCHM-FIBR-FUTR	= discipline code + major group + minor group + status

e. Attributes

i. **Linetypes**

The default linetype of each layer is typically CONTINUOUS unless otherwise specified. Drawing entities shall assume the linetype property of the layer on which they reside. This means that the linetype of individual entities shall be assigned 'by layer' as opposed to 'by entity.'

ii. **Colors**

The UCB OIT Telecom CAD Dept. recommends the use of specific colors for core layers and annotation layers (see the previous section regarding the definition of core layers). Drawing entities shall assume the color property of the layer on which they reside. This means that the color of individual entities shall be assigned 'by layer' as opposed to 'by entity.'

iii. **Pen Weight**

The following chart shows pen weight assignments, which should maximize the printed clarity of drawings conforming to the color assignments of the UCB OIT Telecom CAD Dept.'s core layers.

Pen # Color	Weight	Core drawing elements (including, but not limited to):
1 red	.010 in	Emergency Phone
2 yellow	.010 in	Racks, Cable Management
3 green	.010 in	Jacks (alternate ownership), Notes, Dimensions
4 cyan	.010 in	Copper Cable/Equip, Room Numbers, Building,
5 blue	.010 in	Innerduct
6 magenta	.010 in	Fiber (OSP, Terminal Sheets)
7 white	.010 in	Title Block, Fiber Strands (fiber schematics)
20	.010 in	Building Demo
40	.010 in	Conduit
80	.010 in	Cable TV
150	.020 in	Project
165	.010 in	Temp
240	.010 in	Jacks, Fiber Strands (alternate ownership, fiber schematics)

14. Fill and Hatch Patterns
    a. Limit excessive use of hatch patterns to avoid unnecessarily large files. All consultants are responsible for keeping files sizes within reasonable limits. A solid hatch shall be created by only using AutoCAD "SOLID" hatch pattern. Using dense hatch patterns to create solid fill shall not be permitted in the drawing set.
15. AUTOCAD Drawing Support Files
    a. Drawings created using non-standard AutoCAD fonts, linetypes and hatch patterns can result in content discrepancies in the delivered drawing set. To ensure the integrity of the drawing set, and minimize potential problems:
        i. Only native AutoCAD fonts, linetypes and hatch patterns shall be used. These are standard support features installed as part of a standard AutoCAD installation.
        ii. Postscript fonts shall not be used.
16. File Name Conventions
    a) As explained in the section entitled Model Space and Paper Space, the UCB OIT Telecom CAD Dept. requires that each CAD file submitted as a project deliverable, contain only one major drawing model with one title block (i.e. one building plan, etc.). This policy allows each CAD file produced for either a facility documentation project or a construction project to be named according to the conventions outlined below
        i. Naming Facility Documentation Drawings (primary method):
            1. CAD files produced by Preferred CAD Vendors, which typically contain drawings of existing facility conditions should be named according to the following examples:

EXAMPLES:

wlrd_327_1f.dwg	= building + first floor 1f
tcom_210_1b.dwg	= building + basement 1b
fib_144.dwg	= fiber schematic for cable 144
fib_144_2.dwg	= fiber schematic for cable 144, sheet 2
stad_378_tr_1b23.dwg	= terminal sheet for Stadium, Room 1B23

ii. Building ID Code:

1. The standard UCB OIT Telecom CAD Dept. building identification code assigned by UCB Facilities Management is normally a four (4) alpha character code. The standard building identification codes that pertain to your project can be found on the Zip files mentioned in section D7060.11 1. A.

iii. Floor ID Code:

1. The standard floor identification code follows a two digit numbering system. Floors above or at grade are numbered sequentially in ascending order, starting with 1f, 2f, 3f, etc. Floors that are below grade are numbered in descending order, starting with 1b (basement), 2b, (sub-basement), 3b, etc.

17. Standard Sheet Sizes and Formats
    a. All sheet sizes are to be limited to three standard formats. Required sheet size is specific to each project and is under the discretion of the University. They are as follows:
        i. A Sized Plot 8 1/2" x 11"
        ii. B Sized Plot 11" x 17"
        iii. D Sized Plot 24" x 36" (preferred format)
18. Raster Graphics
    a. Raster files shall not be used to represent the project geometry, e.g. building plans or other drawings shall not be scanned and inserted as raster files. Raster files may be used for the incorporation of existing condition photos or similar applications. Raster files included in a drawing shall be placed on layer T-RSTR.
19. CAD File Transmittal
    a. The content of electronic drawings must match the delivered original hard copy set as closely as possible, if not exactly. To ensure the integrity of the electronic drawing set upon delivery to The UCB OIT Telecom CAD Dept.:
        i. Ensure the drawings adhere to the guidelines presented in this document.
        ii. Include a transmittal sheet (electronic and hard copy) with all submittals indicating the UCB OIT Telecom CAD Dept. project number, project name and complete listing of all materials submitted, including filenames and sheet numbers for each item included in the submittal. This ensures the completeness of the drawing set and assists in archival procedures.
        iii. Submit hard copies of field drawings.
        iv. Submit AutoCAD .PC3 plot configuration files whenever necessary.
        v. Electronic data deliverables are required with all major submittals.
20. Documentation
    a. The delivered CAD drawing files must be accompanied by the documentation described below. This information must cover all CAD files delivered to the UCB OIT Telecom CAD Dept.
        i. A list of any extended discipline codes, non-standard drawing type codes, and user defined codes that are used in the CAD file names.
        ii. A list of approved exceptions to the standard layer structure (a single exception list is acceptable if all files conform to the list.
        iii. A list of any deviations from the standards, with reference to the written approval obtained for those deviations that required prior approval.

iv. A description of any third party products that have been used with the drawings and reference to written approval for their use is required. This is necessary if the CAD application software:
    1. Affects the UCB OIT Telecom CAD Dept.'s ability to review or edit the drawings.
    2. Requires the UCB OIT Telecom CAD Dept. to own a license to the software to work with the CAD files without violating the software's copyrights.

21. Software and Software Licenses
    a. The UCB OIT Telecom CAD Dept. requires that the delivered CAD files be usable without any additional software licenses or installation.

D7060.12 – OIT CAD Department Procedures

1. Requesting CAD Data from UCB OIT CAD Department
    a. Consultants may request copies of existing CAD data for University facilities. CAD Data is provided for the convenience of the recipient only. This data has been gathered from a variety of sources and it may or may not conform to University of Colorado at Boulder standards. The data may be incomplete, or may not accurately reflect current facility conditions. The UCB OIT Telecom CAD Dept. makes no representation as to the data's completeness or accuracy. CAD data submitted by consultants to the UCB OIT Telecom CAD Dept. must be accurate and must conform to the current CAD standards, even if reference data provided by the UCB OIT Telecom CAD Dept. was inaccurate or did not conform to the standards.
    b. Acquisition of Electronic (Outside Plant (OSP) Map) Data: All rights reserved. Map data provided by Facilities Management CAD Office is intended for the sole use of the contractor to satisfy obligations to the University of Colorado construction contracts. The map information may include copyright Electronic Spatial Data from Boulder County and/or the City of Boulder and may not be copied, duplicated, or redistributed in any way, in whole or in part, without expressed written consent by Boulder County and/or City of Boulder. Agreement of "Electronic Data Limitations and Conditions of Use" must be entered into by and between the University of Colorado and consultant prior to release of above mentioned electronic data.
2. Submittal Requirements
    a. All AutoCAD drawings forwarded to the UCB OIT Telecom CAD Dept. shall be submitted in a timely fashion, coinciding with the needs of the project and The UCB OIT Telecom CAD Dept. staff. The delivery of AutoCAD documentation during various project stages shall be timed appropriately to ensure that the UCB OIT Telecom CAD Dept. ultimately receives the most accurate information available. The receipt of electronic AutoCAD drawings alone does not alleviate the responsibility of the Consultant for providing hard copy documentation to the UCB OIT Telecom CAD Dept.
    b. The following documentation shall be delivered to the UCB OIT Telecom CAD Dept. at the following project milestones:
        i. Construction:
            1. The UCB OIT Telecom CAD Dept. requires a complete set of Construction Documents in AutoCAD and hard copy format when the project enters the construction phase. The number of hard copy sets required will vary depending on the project. Contact UCB OIT Telecom CAD Dept. client representative for quantity of hard copy sets required for the project.
        ii. Completion:
            1. When the project has been completed, the Consultant shall submit a complete set of As-built documents in AutoCAD electronic and hardcopy formats to the UCB OIT Telecom CAD Dept.

2. Refer to the "As-Built Drawings" specification in D7040.13 number 6 for additional as-built guilelines.
3. Refer to the construction specifications for further detail in regards to "Construction Drawings As-built Requirements" in Appendices D7040.131. https://www.colorado.edu/facilities-standards/

3. Submittal Schedule
    a. The final submittal of as-built CAD data should be made after project construction is complete and facilities have been occupied. In addition, the UCB OIT Telecom CAD Dept. may require sample submittals at key milestones in the development of the CAD drawings, specifications and data in accordance with the contract and/or UCB OIT Telecom Division Standards. Sample submittals are not intended to be a burden on the Consultant, and typically will involve a very limited number of drawings. Digital media submittals, as a minimum, shall be provided at the first and final submittal milestones. Providing digital media at the first submittal milestone will allow the UCB OIT Telecom CAD Dept. to verify that the data structures being used by the Consultant conform to the CAD data standards and are readily usable on the UCB OIT Telecom CAD Dept. CAD systems.
4. Validation of Delivered Materials
    a. The UCB OIT Telecom CAD Dept. will validate the CAD data and other materials submitted by consultants. If submittals do not conform to the UCB OIT Telecom CAD Standards Guidelines, the UCB OIT Telecom CAD Dept. may return the materials to the Consultant. The Consultant is responsible for revising the materials to make them conform to the UCB OIT Telecom CAD Standards Guidelines.
    b. The UCB OIT Telecom CAD Dept. recommends the use of the eTransmit command in AutoCAD to create a .zip file containing all drawings, associated x-refs, pen settings files, etc. to be included in the submittal to the UCB OIT Telecom CAD Dept.
5. Communication About the CAD Standards
    a. These CAD Standards will be most effective for the UCB OIT Telecom CAD Dept. and most usable for consultants if there is communication between consultants and the University Owner's Representative. Consultants should ask questions about the CAD data standards before beginning work. Direct questions to the UCB OIT Telecom CAD Dept. Concerns regarding the impact of the CAD standards on a particular project must be discussed with the Owner's Representative. Consultant's questions are valuable because they help the UCB OIT Telecom CAD Dept. understand the real-world conditions of each project's design and construction process. Questions will raise issues that will result in better CAD standards.
6. Suggestions for the Standards
    a. The content of the manual is intended to be neither static nor all-inclusive and thus will be updated and enhanced as appropriate. Suggestions for improvements are encouraged so that subsequent updates reflect the needs of the University. Submit suggestions, as well as any pertinent new information, which would enhance these standards, to the UCB OIT Telecom CAD Dept. client representative.
7. CAD Quality Assurance Checklist
    CAD drawings delivered upon closeout of project must be accompanied by submission of the following checklist. When a checklist has been signed and submitted, the vendor (architect, engineer, contractor, etc.) is assuring that all materials adhere to the standards and guidelines set forth in this document.
    CHECKLIST –

    File Format and Setup
    ☐ Electronic File Format
    ☐ Scale and Units

- Tolerances
- Text
- Blocks
- Title blocks
- Model Space and Paper Space
- External Reference Files (XREFs)
- Drawing Composition
- Annotation
- Dimensions
- Layering
- Fill and Hatch Patterns
- AutoCAD Drawing Support Files
- File Name Conventions
- Standard Sheet Sizes and Formats
- Raster Graphics
- Cad File Transmittal
- Documentation
- eTransmit
- Software and Software Licenses

Name of Accountable Vendor Representative (please print) _____

Signature of Accountable Vendor Representative_____

Phone Number _____

E-mail _____

Date _____

D7060.13 – OIT CAD Document Examples

1. Jack symbol layout for drops, CAD #, mounting, etc.
    a. Refer to Appendix **D7060.131** for Jack Abbreviations format
2. Small in-house jack symbol layout for drops, CAD #, mounting, etc. example.
    a. Refer to Appendix **D7060.132** for Small in-house example
3. Small in-house Red line example.
    a. Refer to Appendix **D7060.133** for Small in-house Red line
4. Capital Construction jack symbol layout for drops, CAD #, mounting, etc. example.
    a. Refer to Appendix **D7060.134** for Capital Construction example
5. T5 completed for In-house or Capital projects
    a. Refer to Appendix **D7060.135** for T5 example
6. AutoCAD Final jackmap as-built layout for either In-house or Capital projects.
    a. Refer to Appendix **D7060.136** for Final Jackmap as-built
7. Floorplan of the CU OIT Communication room with standard CAD symbols.
    a. Refer to Appendix **D7060.137** for Communication room standard Floor Plan detail

8. Cable Layout with ladder racking of the CU OIT Communication room with standard CAD symbols.
    a. Refer to Appendix **D7060.138** for Communication room Standard Cable Layout detail
9. Relay Rack layout of the CU OIT Communication room with standard CAD symbols.
    a. Refer to Appendix **D7060.139** for Communication room Standard Relay Rack detail
10. Wall layout with hardware and cabling of the CU OIT Communication room with Standard CAD symbols.
    a. Refer to Appendix **D7060.140** for Communication room Standard Wall detail
11. Building Fiber schematic from room to room.
    a. Refer to Appendix **D7060.141** for Fiber schematic sheet
12. Building to Building external cabling and pathways
    a. Refer to Appendix **D7060.142** for Outside Plant (OSP) drawing

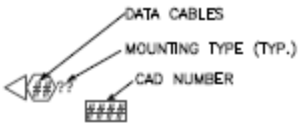
Appendices

D7060.111 – Dimscale Chart for UCB OIT CAD Dept.

DRAWING TYPE	DRAWING SCALE	ACTUAL TEXT HEIGHT	PLOTTED TEXT HEIGHT	DIMSCALE	LISP FILE	UNITS
JACK MAP	1/16”=1’-0”	1’-0”	1/16” (.0625)	192	SETDIM0625ARCH.LSP	ARCH. INCHES
TERMINAL SHEET	1”=1’-0”	3/4”	1/16” (.0625)	12	SETDIM1116ARCH.LSP	ARCH. INCHES
TOPO SHEET	1”=40’-0”	4.4	.11	480		DECIMAL FEET
FIBER SHEET	1/16”=1’-0”	1’-0”	1/16” (.0625)	192	SETDIM0625ARCH.LSP	ARCH. INCHES
MANHOLE	1/2”=1’-0”	3”	1/8” (.125)	24	SETDIM125ARCH.LSP	ARCH. INCHES
DETAIL	1”=1’-0”	3/4”	1/16” (.0625)	12	SETDIM1116ARCH.LSP	ARCH. INCHES

Plotted Text height (inches) x Dimscale = Actual (CAD) text height
Dimscale is the number of drawing scale units in a foot

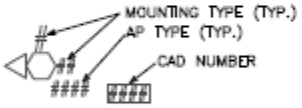
D7060.131 - Jack Abbreviations format



	DESK JACK (18" A.F.F.)	FJ–	FIBER JACK
W–	WALL PHONE	VC–	VIDEO CAMERA
F–	FLOOR MOUNT	+ELEV.	JACK WITH HEIGHT
AC–	ABOVE COUNTER	WL–	WIRELESS JACK
C–	CEILING MOUNT		

NOTE: These abbreviations are intended for record drawings and may need to be modified for construction drawings.

WIRELESS JACKS

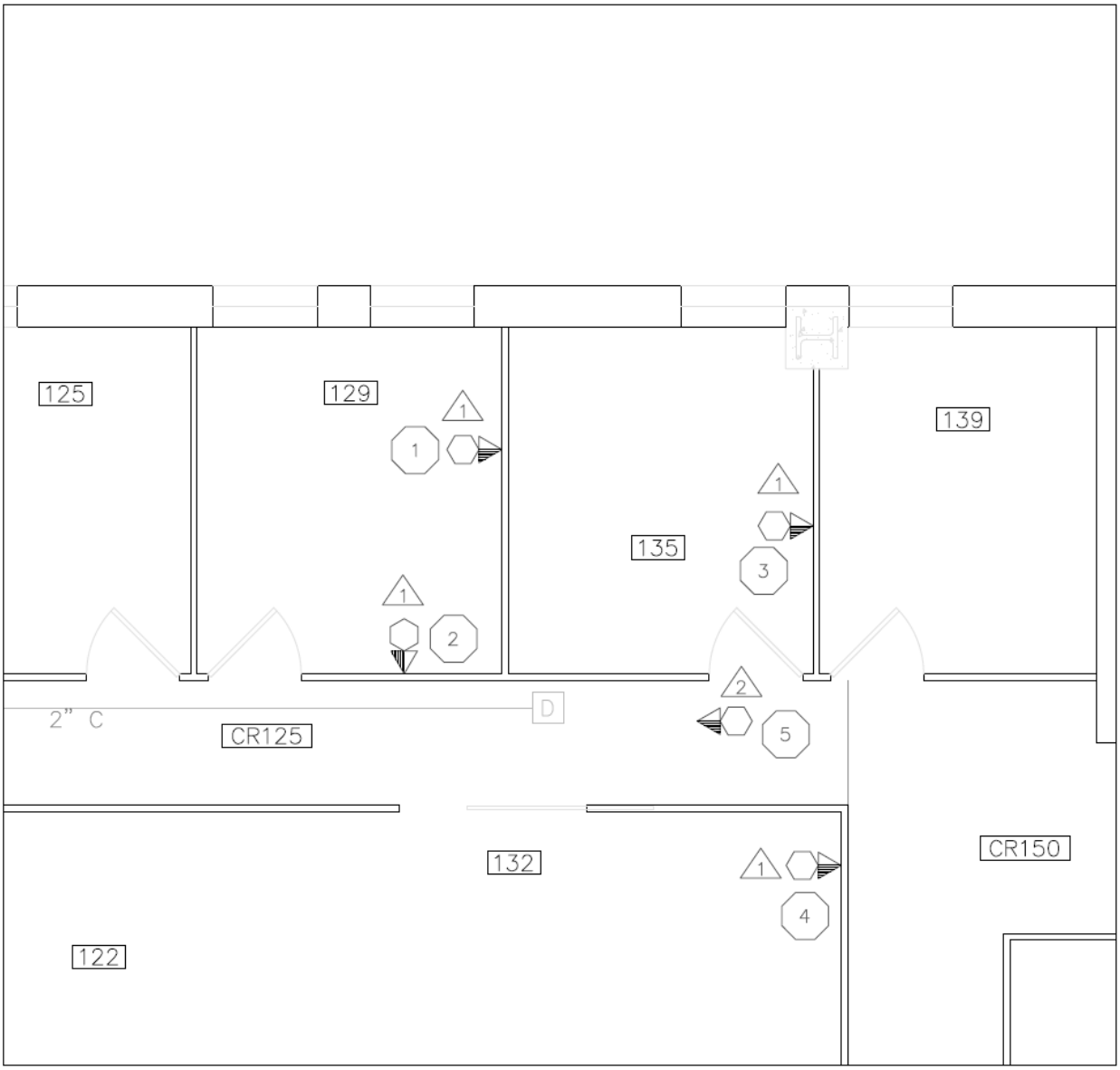


A WLH MR–30H	IN ROOM HOSPITALITY AP.	F WLWD MR–46E	WIRELESS WALL DIRECTIONAL ANTENNA.
B WLS MR–46/46E	WIRELESS SURFACE BOX.	G WLOS MR–46E	WIRELESS OUTSIDE DIRECTIONAL ANTENNA.
C WLSX MR–46/46E	WIRELESS SURFACE MOUNT, NO ENCLOSURE	H WLCD MR–46E	WIRELESS CEILING DIRECTIONAL ANTENNA.
D WLP MR–46	WIRELESS PENDANT.	I WLGM MR–46	WIRELESS GRID MOUNT.
E WLW MR–46/46E	WIRELESS 45 DEGREE WALL MOUNT.	J WLDC MR–46	WIRELESS CEILING GRID WITH BOX.
		K WL MR–46	EXISTING WIRELESS AP (MOUNTING TYPE UNKNOWN)

NOTE: These abbreviations are intended for construction drawings and may need to be modified for record drawings.

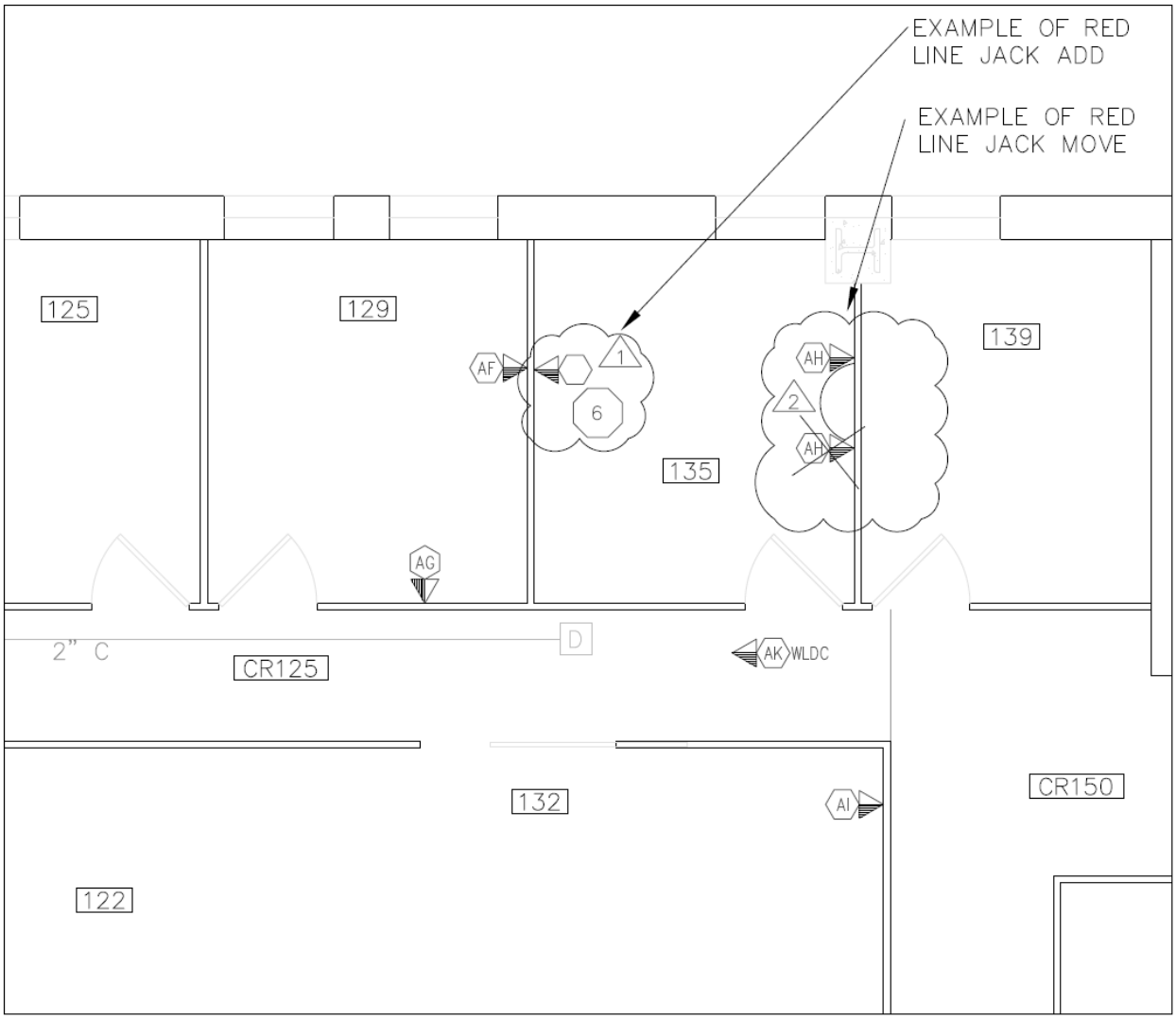
D7060.132 – Small in-house example

This is a design from our internal OIT engineering department.



D7060.133 – Small in-house Red line

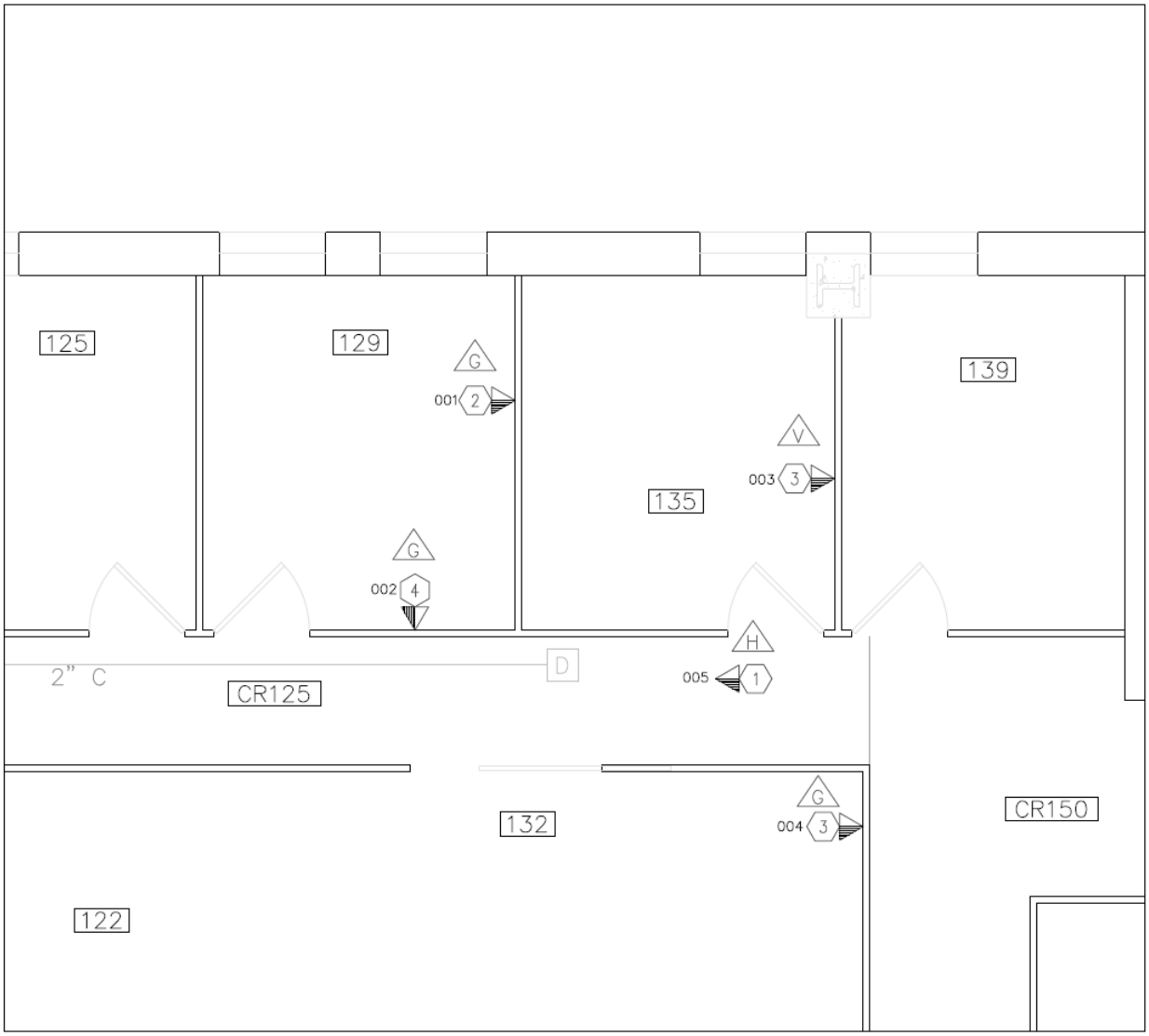
Red line example after Final Jack Testing – Field as-built Jack Print



Note: Added jacks are to be placed at the end of the T5 and patch panel, do not fill in open gaps.

D7060.134 – Capital Construction example

This is a design from our internal OIT engineering department.



Final CAD As-Built.

D7060.135 – T5 completed for In-house or Capital projects

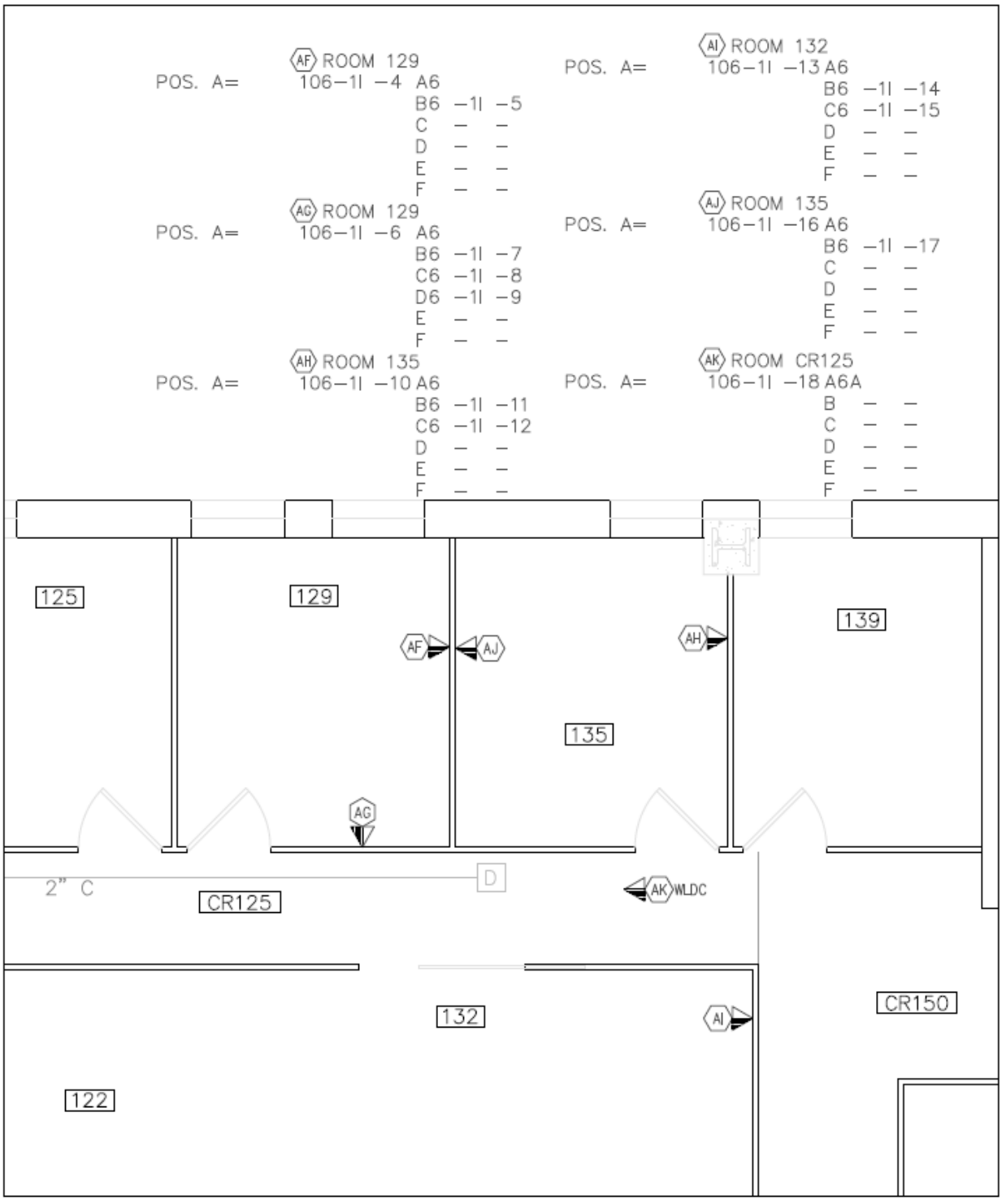
This is a T5 completed from the designs shown above.

CP## Name **MDF #1** **12/4/2020**

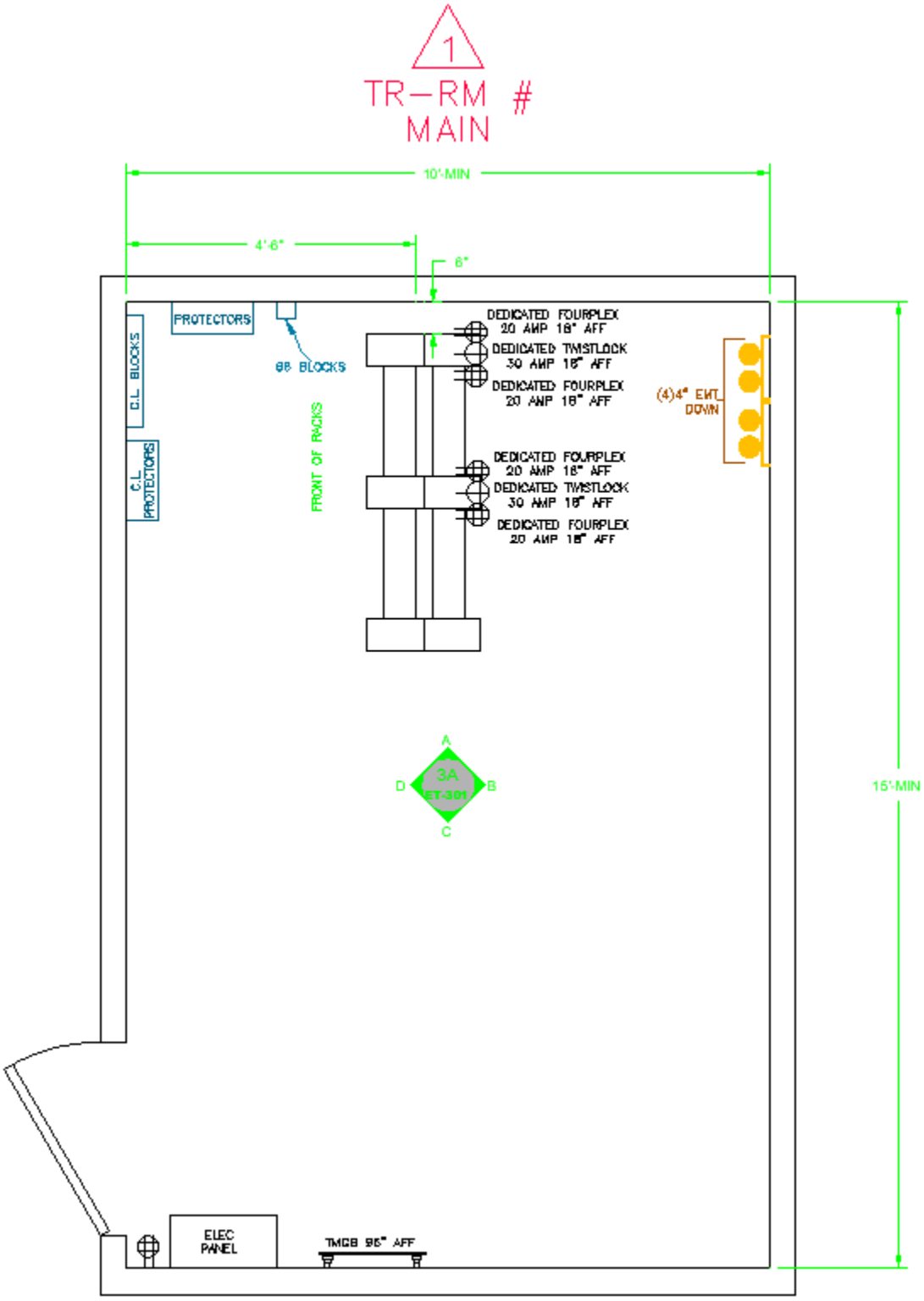
CAD	TR	FP Pos.	Rk.	Panel	Term Pos.	Room	Mtg	Cat	Faceplate Label	Panel Label	Bldg(Bldg#)	CD,COB, RFI, ASI
001	106	A	1	I	4	129	D	6	106-1I-4	1I-4A RM 129	INFO(210)	CD
001	106	B	1	I	5	129	D	6	106-1I-4	1I-4B RM 129	INFO(210)	CD
001	106	C									INFO(210)	
001	106	D									INFO(210)	
001	106	E									INFO(210)	
001	106	F									INFO(210)	
002	106	A	1	I	6	129	D	6	106-1I-6	1I-6A RM 129	INFO(210)	CD
002	106	B	1	I	7	129	D	6	106-1I-6	1I-6B RM 129	INFO(210)	CD
002	106	C	1	I	8	129	D	6	106-1I-6	1I-6C RM 129	INFO(210)	CD
002	106	D	1	I	9	129	D	6	106-1I-6	1I-6D RM 129	INFO(210)	CD
002	106	E									INFO(210)	
002	106	F									INFO(210)	
003	106	A	1	I	10	135	D	6	106-1I-10	1I-10A RM 135	INFO(210)	CD
003	106	B	1	I	11	135	D	6	106-1I-10	1I-10B RM 135	INFO(210)	CD
003	106	C	1	I	12	135	D	6	106-1I-10	1I-10C RM 135	INFO(210)	CD
003	106	D									INFO(210)	
003	106	E									INFO(210)	
003	106	F									INFO(210)	
004	106	A	1	I	13	132	D	6	106-1I-13	1I-13A RM 132	INFO(210)	CD
004	106	B	1	I	14	132	D	6	106-1I-13	1I-13B RM 132	INFO(210)	CD
004	106	C	1	I	15	132	D	6	106-1I-13	1I-13C RM 132	INFO(210)	CD
004	106	D									INFO(210)	
004	106	E									INFO(210)	
004	106	F									INFO(210)	
005	106	A	1	I	16	135	D	6	106-1I-16	1I-16A RM 135	INFO(210)	CD
005	106	B	1	I	17	135	D	6	106-1I-16	1I-16B RM 135	INFO(210)	CD
005	106	C									INFO(210)	
005	106	D									INFO(210)	
005	106	E									INFO(210)	
005	106	F									INFO(210)	
006	106	A	1	I	18	CR125	WLDC	6A	106-1I-18	1I-18A RM CR125	INFO(210)	CD
006	106	B									INFO(210)	
006	106	C									INFO(210)	
006	106	D									INFO(210)	
006	106	E									INFO(210)	
006	106	F									INFO(210)	

D7060.136 – AutoCAD Final jackmap as-built layout for either In-house or Capital projects

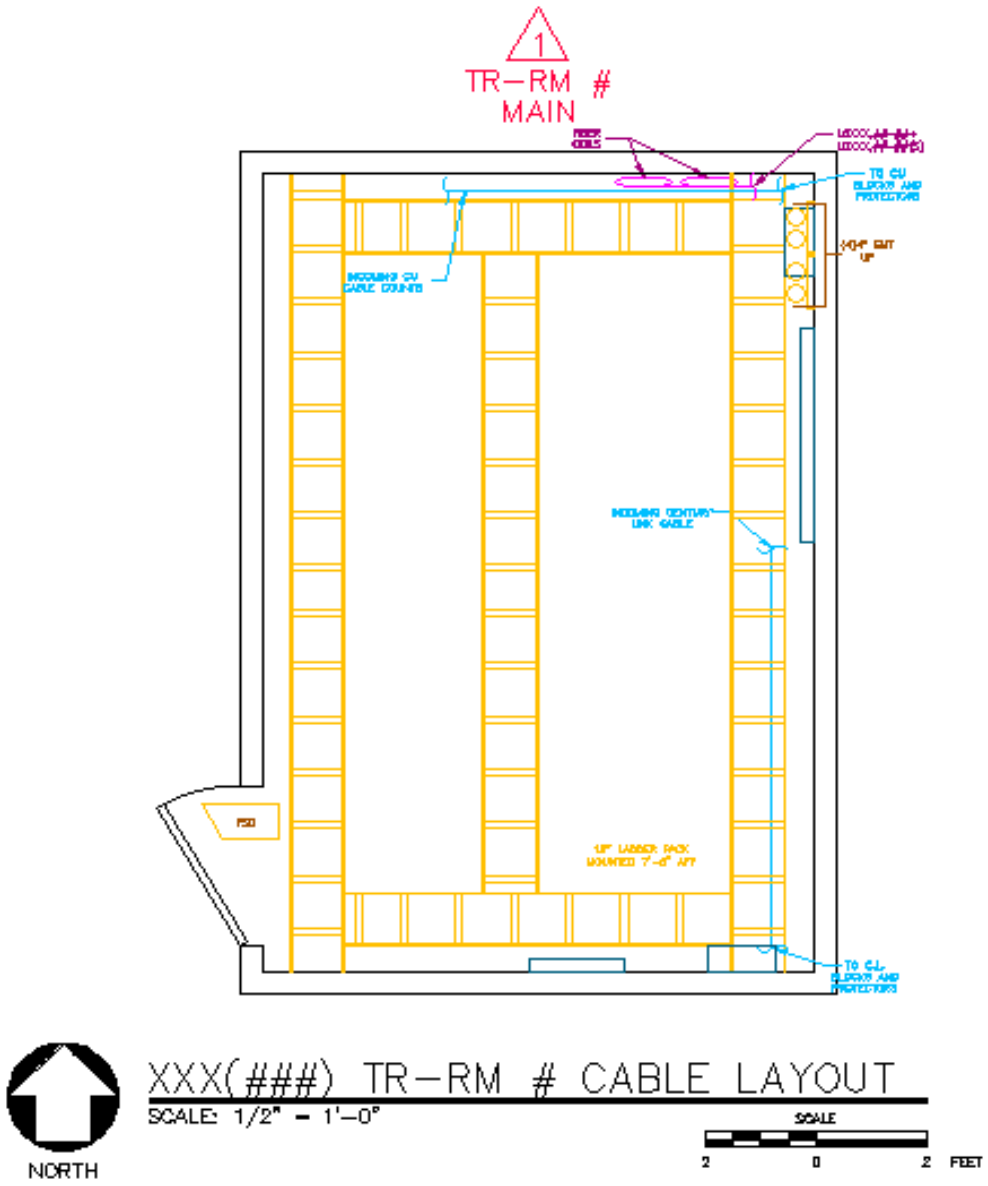
This is the Final design to be as-built to OIT engineering department.


AF ROOM 129
POS. A= 106-1I -4 A6
B6 -1I -5
C – –
D – –
E – –
F – –
AG ROOM 129
POS. A= 106-1I -6 A6
B6 -1I -7
C6 -1I -8
D6 -1I -9
E – –
F – –
AH ROOM 135
POS. A= 106-1I -10 A6
B6 -1I -11
C6 -1I -12
D – –
E – –
F – –
AI ROOM 132
POS. A= 106-1I -13 A6
B6 -1I -14
C6 -1I -15
D – –
E – –
F – –
AJ ROOM 135
POS. A= 106-1I -16 A6
B6 -1I -17
C – –
D – –
E – –
F – –
AK ROOM CR125
POS. A= 106-1I -18 A6A
B – –
C – –
D – –
E – –
F – –
125
129
139
135
132
122
CR150
CR125
2" C
D
AK WLDC

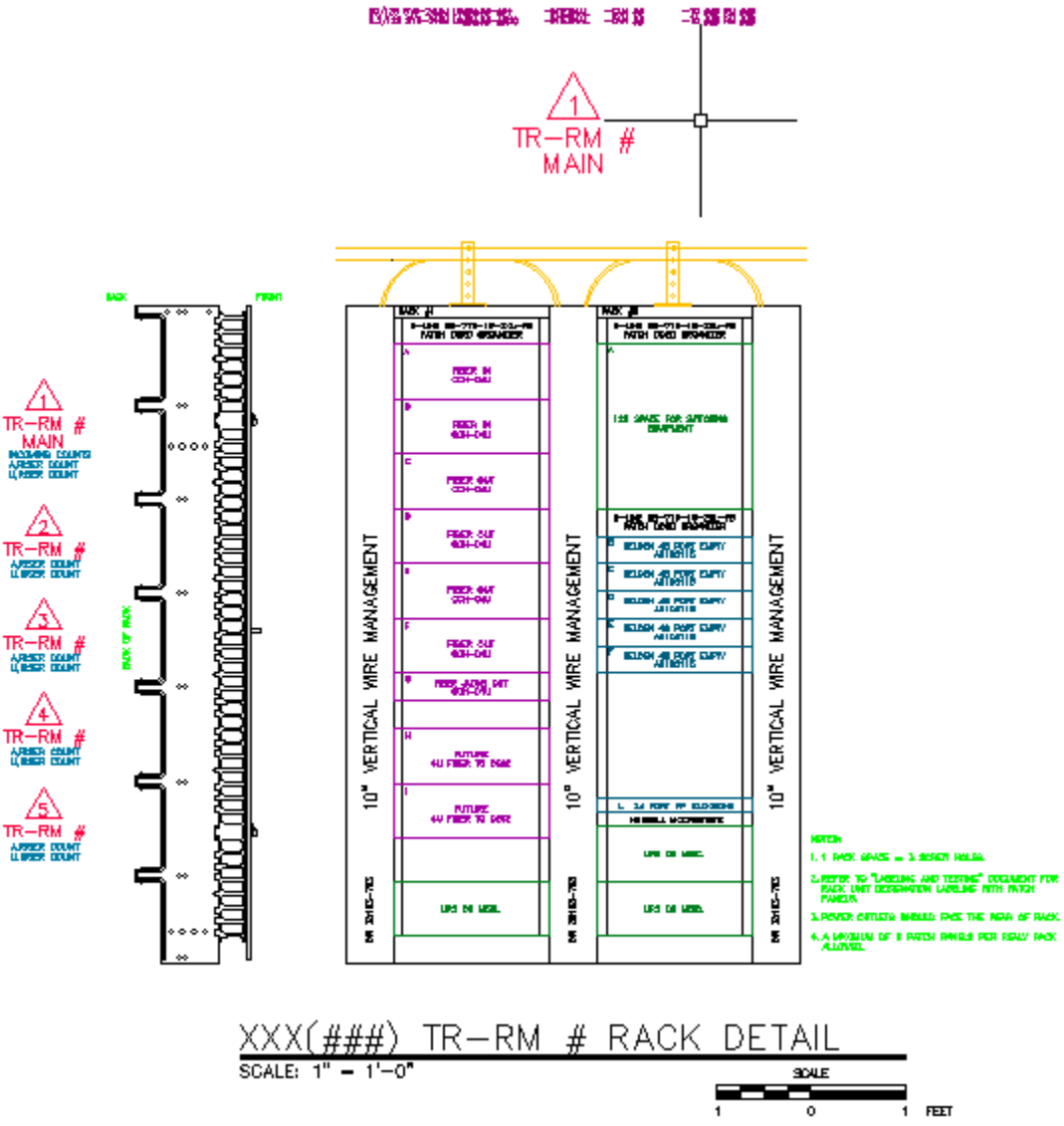
D7060.137 – Communication room standard Floor Plan detail



D7060.138 - Communication room standard Cable Layout detail

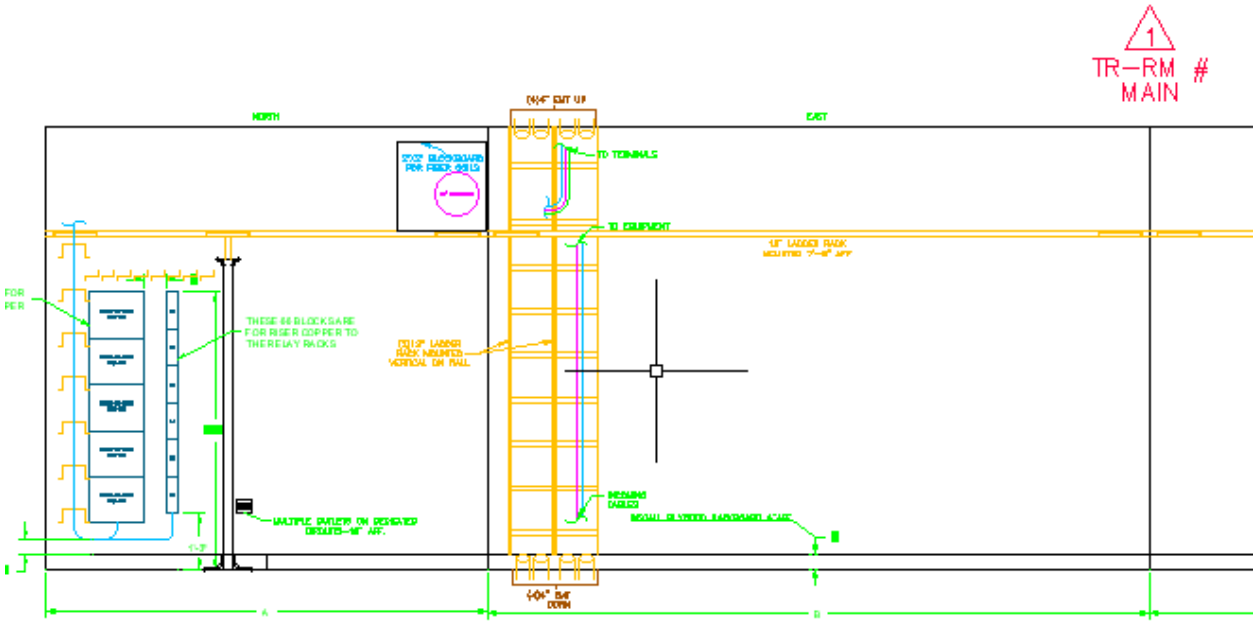


D7060.139 - Communication room standard Relay Rack detail



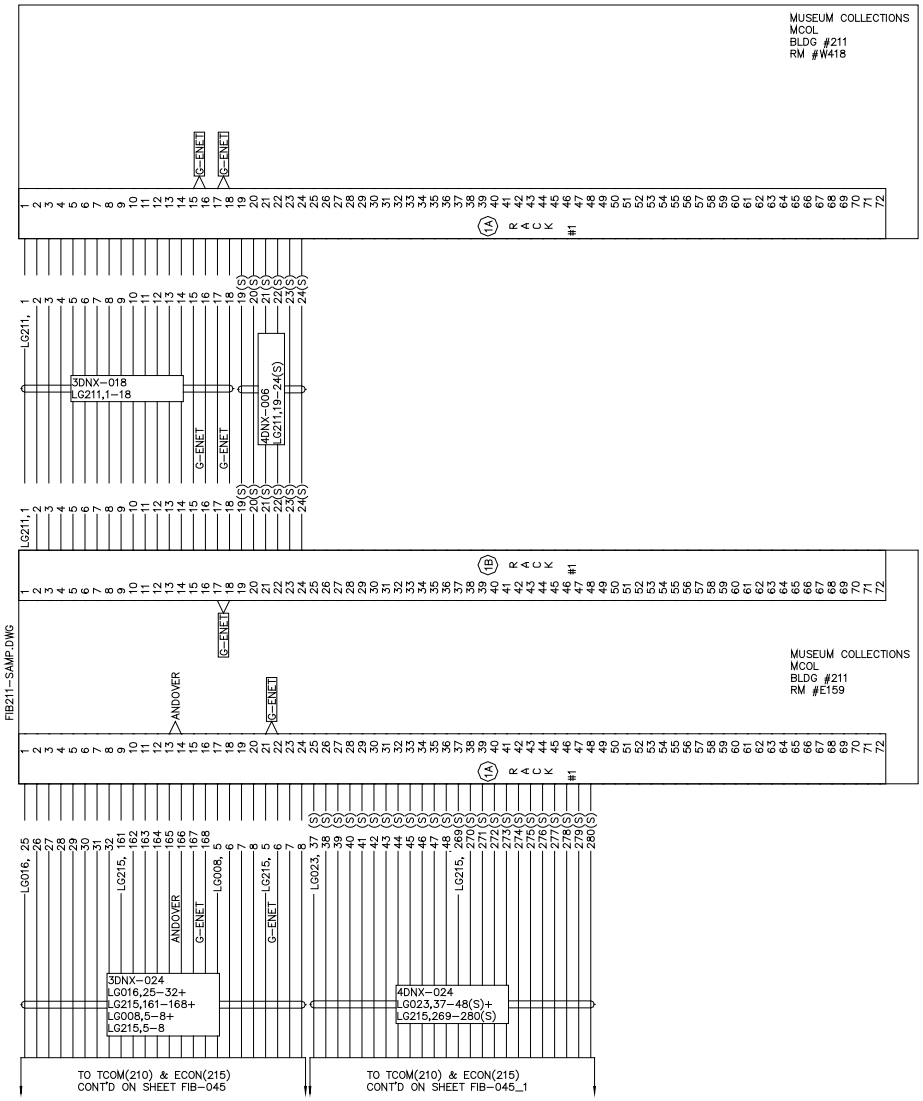
Note: This drawing is an example of an existing terminal condition and is not to be construed as an approved rack standard.

D7060.140 - Communication room standard Wall detail



This is a partial example of the wall detail and a full dwg example shall be requested from the OIT CAD department.

D7060.141 - Fiber schematic sheet


MUSEUM COLLECTIONS
MCOL
BLDG #211
RM #W418
G-ENET
G-ENET
RACK #1
3DNX-018
LG211,1-18
4DNX-006
LG211,19-24(S)
G-ENET
G-ENET
RACK #1
G-ENET
ANDOVER
G-ENET
MUSEUM COLLECTIONS
MCOL
BLDG #211
RM #E159
RACK #1
3DNX-024
LG016,25-32+
LG215,161-168+
LG008,5-8+
LG215,5-8
ANDOVER
G-ENET
G-ENET
4DNX-024
LG023,37-48(S)+
LG215,269-280(S)
TO TCOM(210) & ECON(215)
CONT'D ON SHEET FIB-045
TO TCOM(210) & ECON(215)
CONT'D ON SHEET FIB-045_1
FIB211-SAMP.DWG

D7060.142 - Outside Plant (OSP) drawing