Section D7040
IT Contractor Requirements

D7040 – Subsections:

D7040 - Introduction

This section outlines standards and requirements for IT Contractors in all campus projects.

D7040.11 – Contractor Administration

1. Carefully study and compare the Contract Documents and at once report to UCB and/or the Consultant any error, inconsistency or omission identified. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the attributable cost for correction.
2. Advise UCB as early as possible of any product delays and minimum quantity requirements that may affect the project timeline.
3. Immediately notify the OIT Construction Manager (CM) and the Consultant, should conflicts, discrepancies, deficiencies, or errors arise which require changes in the Contract Documents. Failure to do so shall be interpreted as the intention of the Contractor to supply all necessary labor and materials for the suitable completion of this work. The Contractor shall obtain written approval on necessary adjustments before the installation is started.
4. In the event that the Consultant is required to provide additional engineering services as a direct result of the Contractor's errors, omissions or failure to conform to the requirements of the Contract Documents,

then the Consultant's expenses in connection with such additional services shall be paid by the Contractor and may be deducted from any monies owed the Contractor.

5. In the event that the Consultant is required to provide additional engineering services as a result of substitution of equivalent materials or equipment by the Contractor, or changes by the Contractor in dimension, weight, power requirements, etc., of the equipment and accessories furnished, or if the Consultant is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, then the Consultant's expenses in connection with such additional services shall be paid by the Contractor and may be deducted from any monies owed the Contractor.

D7040.12 – Project Management and Quality Assurance

1. Designate and identify a Project Manager (PM) to oversee the project work specified in this Division and to attend all project meetings as a representative of the Contractor. The Contractor's PM shall have the authority to act for the Contractor, and all communications given to the Contractor's PM will be deemed to have been given to the Contractor.
2. The Contractor shall not begin construction on any project without written notice to proceed.
3. All additional costs must be approved in writing with a change order signed by the OIT CM or authorized OIT management.
4. The Contractor's PM shall perform project management and coordinate all phases of the project with UCB staff.
    a. Attend weekly project management meetings on site or at the Computing Center (COMP) Building on the UCB campus as requested by OIT.
    b. Provide and maintain a complete project schedule and timeline for all project activities including installation, inspection and testing for each work activity in each building. The project schedule will be provided by the Contractor's PM at the first project meeting within one week of contact award. The project schedule and timeline shall be updated as appropriate and will be provided and reviewed at each weekly project meeting thereafter.
5. Provide on-site job supervision:
    a. Designate and identify on-site job supervisor in advance.
    b. Provide no more than one supervisor per job.
    c. Provide one primary contact, one backup contact.
    d. Inform UCB if contact is unavailable.
    e. Remove employees with behavior unacceptable to UCB.
6. Maintain the following information readily available to be provided to UCB upon request:
    a. CU OIT Standards specifications specific to the project.
    b. Submittals.
    c. All Change Orders.
    d. The Field Observation and inspection reports. Confirm inspection requirements with OIT before construction.
    e. Test results.
    f. Schedule and outage logs.
    g. Contract drawings – created by the consultant on capital projects (also on some midlevel projects non-capital)
    h. Redlined shop drawings set showing all changes. – created by the low voltage cable contractor
7. Maintain the following information on the job site:
    a. All project related drawings.
    b. All addenda to the drawings.
    c. Approved Termination Schedule jack position sheet for all horizontal cabling.
8. Assist UCB in performing periodic inspections for evaluation and functional testing of communications subsystems or sections, as completed. The Contractor shall assist UCB in performing evaluation and functional testing of complete communications system(s).

9. Conduct an overall quality assurance program.
10. Apply and install materials, equipment, and specialties in accordance with manufacturer's written instructions. Conflicts between the manufacturer's instructions and the specifications shall be referred in writing to UCB for resolution.
11. All products, components, devices, equipment and materials shall be new and unused, clean, free from defects, and free from damage and corrosion.
12. Installation and service shall be performed by manufacturer trained and authorized personnel.
13. Contractor(s) shall provide all services labor, materials, tools, and equipment required for the complete and proper installation of interior and exterior telecommunications pathways as called for in these specifications and related drawings.

D7040.13 – Submittals

1. For Consultant Designed projects, the Contractor shall submit, for review and approval, a complete list of all materials, components, equipment, systems, and products proposed. The list must be organized in the same order that the product data submittals are presented. See the sample below:

Line	Submittal Page(s)	Description	Manufacturer	Part Number	Section
1	1-2	Floor-mount 19" Rack –1000 lb Standard – Clear Finish	CPI	55053-503	D7030
2	3	Vert Manager 7'x 10" Double Sided	CPI	30163-703	D7030
3	4-5	Ladder rack 12" wide	CPI	10250-112	D7030

2. Product Data
    a. Product submittals are required for all manufacturer's products listed as "approved" in this D7000 standards and items not listed in this standard However, listed manufacturers products are held to all conditions of this specification. The Contractor may be required to provide submittals for clarification of a specific item of equivalency prior to installation.
    b. Manufacturer's catalog sheets and specifications for field-test instruments.
    c. Documentation of current calibration for optical fiber test instruments.
    d. Training certificates for technicians performing optical fiber testing.
    e. Final verified As-Built Termination Schedule Jack Numbering Position Sheet as specified in Section D7040.13.
    f. Final verified As-Built Drawings as specified in Section D7040.13.
    g. Final verified As-Built Test Reports as specified in Section D7040.13.
    h. Product submittals shall be provided for all products not listed as "approved" in this D7000 standards. The product submittals shall show, as a minimum, the following:
        i. Manufacturer
        ii. Complete model and part number.
        iii. Physical characteristics such as dimensions and color.
        iv. Technical specifications and performance data.
        v. Any other pertinent information necessary to determine adequacy for the intended application.
3. For In-House projects, the Contractor is only required to submit a list and product data for those products not listed as "approved" in this D7000 standards.
4. Substitutions
    a. For Consultant Designed projects, the schedule shall be coordinated through the General Contractor and provided to the UCB Project Manager and the UCB OIT Construction Manager (CM). The schedule must be in MS Project format, or other UCB approved equivalent, and shall

include all major milestones and critical dates for project completion, including, but not limited to:

i. Required service activation dates (wireless network jacks, data jacks for building control, data jacks for C-cure, data jacks for security cameras, telephone lines for elevators, fiber for fire alarm loops, voice and data for occupancy, etc.)
ii. Infrastructure completion dates (Telecom rooms, cable pathways, backbone cabling, station cabling, etc.)

b. For In-House projects, the Contractor shall submit a working schedule to OIT in MS Project format, or other OIT approved equivalent, within five business days from receiving notice to proceed.
   i. The Working schedule shall identify all major milestones and planned dates including, but not limited to: Termination Schedule template provided, materials ordered/received, construction start, cable pathways complete, cable complete and ready for testing, as-built drawing submittal, test result submittal.
   ii. If the communications project work is related to a construction project, the Contractor shall coordinate directly with the General Contractor to determine the overall project schedule, and the working schedule should identify any dates that are contingent upon work to be done by other trades (e.g., conduit, drywall, painting, etc).
   iii. If the schedule for the communications project changes, the Contractor shall update and re-submit the working schedule within two business days of the schedule change.

5. Termination Schedule (formally known as the Termination Schedule) Jack Numbering Position Sheet
   a. For Consultant Designed projects, the Consultant shall submit the proposed IT outlet numbers, using the Termination Schedule template provided by OIT, for review and approval, prior to construction.
      i. The Termination Schedule shall be submitted at CD level. The first “Draft” Termination Schedule shall be submitted with the first CD package. OIT will review and return comments with any corrections to be made. The Consultant shall submit the updated Termination Schedule, with corrections, within five business days of receiving OIT comments. This process shall be repeated until all corrections have been made and the Final 100% CD version is approved by OIT.
      ii. The Final 100% CD version of the Termination Schedule shall be provided to the Contractor in electronic format prior to construction. The Contractor shall maintain hardcopy of the Termination Schedule on-site, and shall label all terminations in accordance with the Termination Schedule, during construction.
      iii. If the quantity/location of IT outlets changes during the post-CD construction process, the Contractor shall update and submit the Termination Schedule to the OIT CM and the Consultant, with all changes highlighted. All changes to the Termination Schedule must have the approved signature of the OIT CM before installation.
      iv. Once an outlet number has been assigned on the drawings and Termination Schedule sheet, it shall never change for any reason. Deletion of outlets will not change any of the other outlet numbers on the drawings or Termination Schedule sheet.
      v. At least one (1) week prior to occupancy, or as agreed upon per the project schedule with OIT, the Contractor shall submit an updated electronic copy of the Termination Schedule sheet, to the OIT CM and the Consultant. The installed work and outlet numbering shall be based on the actual device locations and updated Termination Schedule.

vi. Within two (2) weeks of final testing, the Contractor shall submit the tested Termination Schedule to the Consultant and the OIT CM, with all testing corrections. The tested Termination Schedule shall be submitted in electronic format.
vii. Within four (4) weeks of final testing, the Consultant shall submit the verified "As-Built" Termination Schedule to OIT Infrastructure Engineering Department.
viii. Refer to Appendix **D7040.131** for OIT Termination Schedule guidelines document for detailed information on completing the Termination Schedule to OIT standards.

b. For In-House projects, the Contractor shall submit the proposed outlet numbers, using the Termination Schedule template provided by OIT, for review and approval, within 5 business days from receiving notice to proceed.
i. OIT will review and return comments with any corrections to be made. The Contractor shall submit the updated Termination Schedule, with corrections, within two business days of receiving OIT comments. This process shall be repeated until all corrections have been made and the "Final" version is approved by OIT.
ii. The Contractor shall maintain hardcopy of the Termination Schedule on-site, and shall label all terminations in accordance with the Termination Schedule, during construction
iii. If the quantity/location of IT outlets changes during the construction process, the Contractor shall update and re-submit the Termination Schedule to the OIT CM, with all changes highlighted. All changes to the Termination Schedule must have the approved signature of the OIT CM before installation.
iv. Once an outlet number has been assigned on the drawings and Termination Schedule sheet, it shall never change for any reason. Deletion of outlets will not change any of the other outlet numbers on the drawings or Termination Schedule sheet.
v. At least one (1) week prior to occupancy, or as agreed upon per the project schedule with OIT, the Contractor shall submit an updated electronic copy of the Termination Schedule sheet to the OIT CM. The installed work and outlet numbering shall be based on the actual device locations and updated Termination Schedule.
vi. Within two (2) weeks of final testing, the Contractor shall submit the "As-built" Termination Schedule to the OIT CM.

6. Shop Drawings – Submitted by the IT Consultant.
a. Comply with the UCB OIT Telecom CAD Standards Section D7060.
b. Create shop drawings with electronic CAD project files. Shop drawings created using .pdf contract drawings will not be accepted.
c. Submit shop drawings in .pdf and .dwg format, similar to the contract drawings, for review no later than 30 days before the beginning of any work.
i. The shop drawings shall include (1) jack map with 25 locations that include a mix of drops to include but not limited to standard desk drops, wireless drops, and camera drops all inconsecutive order to confirm AutoCAD blocks, layers, jack numbering, CAD ID lettering, mounting, etc.
ii. The shop drawings shall include (1) terminal room layout per the CU OIT standard and include all 4 details (Wall, Floor, Cable layout, and Rack) with the correct AutoCAD blocks, layers, detail labeling, dimensions, and labeling.
d. Record all changes and deviations on the contract drawings. Changes that must be noted on the record drawings set include, but are not limited to, changes to cabling, materials, cable routing, equipment placement, equipment numbering and labeling, etc. In addition, installed cable footage for all backbone cabling shall be recorded on the record drawings.

e. Any field changes shall be red-lined on the drawings and must have the approved signature (approved RFI, ASI or COB through CU process) of the OIT CM prior to installation. Notations and changes shall be made in a neat and legible manner by marking the original drawings with red to indicate additions and green to indicate deletions.

f. Field verify existing conditions and red-line any deviations on the project drawings. Red-lines based on field verification, do not require OIT signature, but should have "field verified" indicated next to the red-lines.

7. As-Built Drawings – created by the consultant on capital projects (also on some midlevel projects non-capital).
   a. The OIT CM will conduct an as-built walk-through with the Contractor prior to project completion. During this walk-through, a punch list will be developed, and the accuracy of the red line changes will be determined.
   b. **Comply with the UCB OIT Telecom CAD Standards Section D7060.**
   c. All drawings issued are required to be returned to OIT, whether or not as-built modifications (red-lines) are made to the drawings.
   d. As-built document requirements apply to all projects, unless written approval is received from OIT. The as-built documents shall not be delayed for delivery to OIT for any reason.
   e. For Consultant Designed projects, 100% CD documents shall be issued to the Contractor by the Architect / Consultant as specified in Section A0020 following a formal OIT review and approval.
      i. All design changes during construction shall be documented and communicated via ASI, COB, and/or RFI documents, as specified in Section A0020 and include a full sheet submitted for review to OIT with an updated Termination Schedule in excel format.
      ii. All drawing changes during construction shall be submitted to the OIT CM and the Consultant in electronic format.
      iii. The Contractor shall submit hard copy and electronic copy of the final as-built drawings, including red-lined field changes, to the Consultant and to the OIT CM within two (2) weeks of completion of the project. This will be in addition to any submittals to the General Contractor and/or the Architect.
      iv. The Consultant has the final responsibility to provide as-built drawing files, in AutoCAD format, to the OIT Infrastructure Engineering Department for final acceptance and work close out.
      v. OIT will return drawings to the Consultant for correction if information is incorrect or missing. Corrected resubmittals shall be provided to the OIT Infrastructure Engineering Department within two (2) weeks of comment.
   f. For In-House projects, drawings will be issued to the Contractor in AutoCAD format from the OIT Infrastructure Engineering Department and/or the OIT Academic Technology Services (ATS) Engineering Department.
      i. Refer to Appendix **D7040.132** for Construction Drawings AS-BUILT Requirements.
      ii. All drawing changes during construction shall be submitted to the UCB CM in electronic format.
      iii. The Contractor shall submit hard copy and electronic AutoCAD copy of the final as-built drawings, including red-lined field changes, to the OIT CM within two (2) weeks of completion of the project.
      iv. All red line changes from the field set of drawings shall be made to the original AutoCAD drawings using a CAD editor for DWG files.
      v. OIT will return drawings to the Contractor for correction if information is incorrect or missing. Corrected resubmittals shall be provided to the OIT CM within one (1) week of comment.

g. As-built drawings showing pathways (conduit, pull-boxes, cable tray, J-hooks, etc.) for all projects
h. All AutoCAD files submitted to OIT shall be AutoCAD version 2013 or newer.

8. Test Results and Configuration Information
   a. Upon completion of the work the Contractor shall submit final test results and configuration information, as required by each of the individual D7000 standards sections.
   b. Standard OIT test sheets will be provided by OIT for fiber optic cabling.
   c. Test sheets for communication jacks and copper backbone cabling will not be supplied to the Contractor by OIT.
   d. As-built test results shall be submitted to OIT in PDF format using the test equipment's standard output report, including the auto summary page and individual test results for each communication jack.
   e. Comply with the manufacturer's most current warranty procedure and documentation requirements. All testing documentation including, but not limited to the "Belden structured Cabling installation" "Belden 2400 System" . In addition to Belden documents the contractor shall complete in full the installers full name, company name, telephone number, date completed, and OIT jack outlet with faceplate port numbers (e.g., 202-1D-1C5e-1D-3). All documentation shall be provided to both the manufacturer and UCB OIT for warranty.
   f. As-built test results for Consultant Designed projects shall be submitted to the OIT CM and the Consultant by the Contractor within two (2) weeks of project completion.
   g. As-built test results for In-House projects shall be submitted to the OIT CM by the Contractor within one (1) week of project completion.
   h. Pursuant to required warranty validation documentation and procedures for cabling to support specialized technology systems, the Contractor shall provide such documentation as required to the system manufacturer, with a copy to the OIT CM.

D7040.14 – Permits, Licenses, Inspections and Fees

1. Obtain all required permits, licenses and inspections and shall pay all legal and proper fees and charges including taxes, royalties, and other related charges. No work shall be started before obtaining all necessary permits and paying all required fees.
2. Provide UCB with copies of all required building and trade permits, if said are required, at inception of work.
3. Furnish and file with the proper authorities all drawings required by them in connection with this work.
4. Arrange all inspections and secure all required signatures. Upon completion of the work, properly completed permits shall be returned to UCB, if any are required.

D7040.15 – Periodic Inspections and Field Observation Reports

1. UCB OIT will conduct site visits for required inspections and to monitor the progress and quality of the workmanship and the work environment, as well as the surrounding facility. Any item found by OIT to be deficient will be documented on an Inspection Form and/or a Field Observation Report.
2. Take appropriate action to immediately correct and rectify any items deemed unsatisfactory by OIT. The Contractor shall not wait for a hard copy of the Field Observation Report if the action required to rectify the situation is obvious and clear.
3. Post and comply with the following attached document: **OIT CONSTRUCTION INSPECTION REPORT – COMMUNICATIONS** for all aspects of this project.

D7040.16 – Inspections and Tests

1. Furnish promptly, without additional charge, all test equipment, instruments, facilities, labor, and material needed to perform safe and convenient inspection and testing.
2. Prior to beginning work, submit to UCB a complete project schedule and timeline including installation, inspection, and testing for each project area so that interim inspections can be conducted as work progresses. UCB shall not be obligated to inform the Contractor of its intent to inspect job sites while work is in progress.

3. Perform pre-testing of the installed IT systems to determine compliance and the OIT CM when the system is ready for final inspection and testing. The OIT CM, or designated representative, will be present for final inspection and testing within five business days of such notification by the Contractor.
4. At such time as the OIT CM directs, and in the presence of the OIT CM or designated representative, conduct final inspection and testing of all IT systems, both new and existing where modified.
5. Except as otherwise provided in the specifications, inspection and testing of materials and workmanship shall be made at reasonable times and at the site of the work.
6. OIT may determine that inspection or testing of materials, such as fiber optic cabling, shall be made off-site, at the place of production, manufacture, or shipment of the material. Such off-site inspection or testing shall not relieve the Contractor of responsibility for damage to, or loss of, the material prior to acceptance, nor in any way affect the continuing rights of UCB after acceptance of the completed work.
7. Work shall not be covered up or enclosed until inspected by UCB OIT personnel or other proper authorities. Should any work be covered up or enclosed before such inspection, it shall be uncovered, inspected, and after approval, restored by the Contractor to finished condition at no additional cost to UCB.
8. All work that is determined to be unsatisfactory shall be corrected immediately. The Contractor shall, without charge, replace any material or correct any workmanship found by UCB not to conform to the specifications, unless UCB consents to accept such material or workmanship with appropriate adjustment in price. The Contractor shall promptly segregate and remove rejected material from the premises. The Contractor shall pay the additional cost of any test or inspection of the replaced material or corrected workmanship.
9. The Contractor shall prepare reports of final test results, together with UCB OIT standard test sheets and all additional pertinent information, and submit these in electronic PDF format the OIT CM and the Consultant for acceptance.
10. The IT rooms, and other rooms containing communications technology systems identified as part of the work scope for the project, shall be labeled and laid out well in advance of testing. This includes the outlet numbers on the patch panels (as soon as the racks are mounted), to allow pre-inspections, prior to testing for large projects.

D7040.17 – Continuity of Services and Scheduling

1. The buildings may be in use during construction operations. Insofar as possible, the Contractor shall employ such methods or means as will not cause interruption of, or interference with, the owner's scheduled use of the building and will maintain existing systems in operation within all rooms of the building at all times.
2. For areas under renovation, coordinate all installation activities with UCB and other trades for renovations of architectural, mechanical, and/or electrical facilities. Insofar as possible, the Contractor shall employ such methods or means as will not cause interruption of, or interference with, the work of any other contractor.
3. Moving or removing any facility must be done so as not to cause interruption of the project work or of University operation.
4. Disruption of critical services will require after hour or weekend working constraints.
5. Existing communication services shall be interrupted only with consent from UCB. An advance warning time of seven working days shall be given. Such interruptions shall be preceded by all possible preparations which will minimize down time to expedite that particular phase of the work pursuant to good workmanship. This shall be done at regular and premium time as approved by UCB without additional expense to UCB.
6. Adjust work schedule within reason (weekly), as per direction of UCB, and coordinate with work or other trades in order to make portions of project available to UCB as soon as possible.
7. All expenses due to untimely or improperly coordinated work shall be the responsibility of the Contractor.

D7040.18 – Use of Cable Prior to Acceptance

1. The Contractor shall permit the placement and installation by UCB of cross-connects, patch cords, and/or equipment onto cable and terminations installed under this contract, prior to substantial completion of the contract as necessary. Such placement or installation shall not evidence completion of the work or portion thereof, nor signify UCB acceptance of the work or portion thereof.
2. Cabling and equipment provided under this contract, whether the work of the Contractor is partially or fully completed or not, shall be the property of UCB. UCB shall have certain rights and privileges in connection with use of same.

D7040.19 – Final Acceptance and Work Closeout

1. The contractor shall correct all punch list items and fully inspect and test the entire IT system installation, to assure all work is completed and all systems are completely operational, before calling for final inspection, testing and acceptance of work by OIT.
2. After the successful installation inspections and functional testing by OIT and the Contractor, OIT will determine if there are any open issues or discrepancies and notify the Contractor. Upon completion or determined failure, OIT will issue written notification to the Contractor as to the status of the installation acceptance.
3. Contractor close-out prior to invoicing:
    a. Notify OIT when IT work is ready for final inspection, testing, and punch list preparation.
    b. Complete all testing with OIT CM, or designated representative.
    c. Correct all punch list items and notify OIT when ready for final punch list close-out.
    d. Submit as-built Termination Schedule documents, drawings, and test results to UCB OIT and the Consultant / Architect. Keep copies for Contractor file.
    e. Final payment will not be authorized until all punch list items have been resolved and completed to the satisfaction of OIT, with as-built files turned in and approved by OIT, and warranty statements received.
4. Project closeout will be approved by OIT after:
    a. All punch list items have been completed, inspected and accepted by OIT.
    b. Final as-built Termination Schedule documents have been received and accepted by OIT.
    c. Final as-built and record drawings have been received and accepted by OIT.
    d. Manufacturer's warranty statements have been received by OIT.

D7040.20 – Vehicular Access and Parking

1. Provide required parking permits for all construction vehicles furnished by the Contractor. Permits shall be purchased by the Contractor from the University Parking Management Office at 303-492-7384. Any cost to the Contractor for parking related items is not a billable charge.
2. Park only in approved and authorized areas. UCB will not pay the cost of parking tickets.
3. Trucks and other equipment shall not drive on lawns, concrete sidewalks, or concrete curbs unless approved in writing by the UCB Project Manager. All lawns, shrubs, walks, irrigation equipment, tunnels, curbs, or other property damaged in such a manner by the Contractor shall be replaced or repaired in a timely manner by the Contractor to the satisfaction of UCB.

D7040.21 – Identification

1. The Contractor shall ensure that all personnel, including subcontractors and their personnel, wear University issued identification badges. Jackets and/or shirts with company names and logos are helpful, but all workers are required to obtain and display the required University issued ID. Badges will be authorized by the University project manager. All owner provided Contractor ID's must be returned upon completion of the project work.
2. Equip all vehicles with signs identifying the Contractor's company. All vehicles used on campus by Contractor personnel, whether owned by the employee or the Contractor, shall have visible company identification on both sides of the vehicle. Magnetic signs are acceptable.

D7040.22 – Contractor Responsibility for Conducting Background Check

1. All employees of the Contracting firm must pass a background check using a national criminal database standard for the industry.
2. Contractors are solely responsible for conducting background checks on all employees, agents, and subcontractors that provide services to CU-Boulder and certifying that such employees and agents have satisfactorily completed the background check. It is expected that background checks would be reviewed and cleared on a case by case basis for the following at a minimum:
    a. Not a registered sex offender
    b. No convictions (felony or misdemeanor) in the past 3 years for drug use/distribution
    c. No convictions (felony or misdemeanor) in the past 3 years for serious or violent crimes, including but not limited to homicide or sexual assault
    d. No convictions (felony or misdemeanor) in the past 3 years for theft or destruction of property

D7040.23 – Delivery and Storage

1. Make provisions for the delivery and safe storage of all materials and equipment. Specific delivery and storage instructions to be coordinated between UCB and Contractor in advance.
2. Mark materials and store in such manner as to be easily checked and inspected.
3. Store all materials and equipment out of the weather and protected from damage, theft, and vandalism and assume complete responsibility for losses due to any cause. Store materials on dry base at least 6" above ground or floor and provide waterproof covering. Remove and provide special storage for items subject to moisture damage. Replace items stolen or damaged at no cost to UCB.
4. Equipment or materials stored on site shall be stored so as not to interfere with other work, block passageways, or obstruct access/exits to buildings or facilities.
5. Where materials are indicated to be furnished by other or by UCB for installation under this Division, make a complete and careful check of all materials delivered and furnish a receipt acknowledging acceptance of the delivery and condition of the materials delivered. After such acceptance, assume full responsibility for their safe-keeping until such time as the completed installation has been accepted.
6. Use of trailers may be required. Coordinate with UCB for location of any required trailers.
7. Contractor shall be responsible for all costs associated with materials and equipment delivery and storage.

D7040.24 – Site Access and Coordination with Occupants

1. Contractor shall have access to site during normal business hours subject to any work restriction for the duration of the project.
2. Perform work in a manner so as to minimize disruption to the ongoing day-to-day activities of the occupants of the facility.
3. Notify UCB to schedule activities that may disrupt the occupants.
4. There are areas of the buildings where access is restricted or regulated for personnel safety. UCB will identify such sensitive work areas in which advanced scheduling and admittance permission is required.
5. Doors to Telecom Rooms shall be closed and secured at all times when unattended.

D7040.25 – Site Restoral and Cleanup

1. Keep the buildings, premises and surrounding areas free from accumulation of surplus, waste materials or rubbish caused by operations at all times.
2. Remove tools, equipment and scaffolding, and leave the area where the work has been done broom clean at the end of each workday. In the case of dispute, the University may remove all such items and charge the cost of such removal to the Contractor.
3. Before leaving each day, remove all surplus material, waste material, empty boxes, crates, and rubbish, and transport rubbish to an off-site location, unless an on-site location for waste disposal is designated by the University. All MAC work will not have an on-site location for material. Use of University dumpsters and trash cans is prohibited.
4. Keep clean all equipment and fixtures for the duration of the project.

5. Upon completion of work and before acceptance, remove from the site all surplus and discarded materials, temporary structures, tools, and debris. Surplus and waste materials removed from the site shall be disposed of in accordance with applicable laws and regulations.
6. Equipment shall be turned over to UCB in perfect, unblemished condition.
7. Replace, restore, or bring to original condition any damaged floors, ceilings, walls, furniture, grounds, pavement, etc., caused by Contractor personnel and operations. Restore damage or disfigurements and repair surfaces, including finish and/or paint, to match existing.
8. Upon completion of work and before acceptance, thoroughly clean the entire work area including all equipment and fixtures, both exposed surfaces and interiors. Final cleanup at job completion shall include:
    a. Exterior: In addition to items specified below, any new surfaces on exterior, concrete, metal, etc. shall be carefully and thoroughly cleaned.
    b. Hardware: Clean and polish all hardware and leave clean and free from paint, grease, dirt, etc.
    c. Electrical: Clean and polish all electric fixtures, including glassware, switchplates, etc. and leave clean and free from paint, grease, dirt, etc.
    d. Equipment: Carefully and thoroughly clean all items of equipment, mechanical, electrical, cabinets, ductwork, etc.
    e. Floors: Thoroughly clean all floors. Vacuum and clean all carpeting. Sweep all hard surface floors.
9. Leave the site in a clean, neat, and orderly condition at least equal to that which originally existed. All final cleanup of the exterior and interior of the building shall be done by the Contractor or by professional cleaners hired and paid for by the Contractor as required

D7040.26 – Safety

1. Comply with UCB regulations as specified in UCB standards section A0000 through A0050 and standards section G0010 through G3060 for all outside plant (OSP) construction, including, but not limited to, work in confined spaces, and mitigation of asbestos, lead, or other hazardous materials.
2. All applicable state, federal and local safety regulations shall be adhered to and all operations shall be conducted in a safe manner.
3. Guard manhole and tunnel openings per NESC requirements:
    a. When covers of manholes, handholes, or vaults are removed, the opening shall be promptly protected with a barrier, temporary cover, or other suitable guard.
4. Test for gas in manholes and unventilated vaults per NESC requirements.
5. All outside plant (OSP) construction shall be fenced off and holes covered off hours and when not active according to UCB requirements.
6. Comply with UCB regulations and safety requirements, including, but not limited to, work in confined spaces, and mitigation of asbestos, lead, or other hazardous materials.
7. Contractor personnel working in hazardous areas shall have current training and applicable certification.
8. Provide hazards training certificates for all personnel working in hazardous areas.
9. Inspect work sites for hazards regularly.
10. Provide safety program documents as required for each project.
11. Take all reasonable precautions for safety of, and provide reasonable protection to prevent damage, injury, or loss to:
    a. personnel conducting project work and other persons who may be affected thereby; and
    b. existing facilities, whether or not such facility is to be removed or relocated; and
    c. project work and all materials and equipment to be incorporated therein, whether in storage or off site, under care, custody or control of Contractor or any subcontractors; and
    d. installed equipment and existing construction; and

e. other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, fences, roadways, structures and utilities not designed for removal, relocation or replacement in the course of construction.

12. Assume responsibility for construction safety at all times and provide, as part of contract, all trench or building shoring, scaffolding, shielding, dust/fume protection, mechanical/electrical protection, special grounding, safety railings, barriers, and other safety features required to provide safe conditions for all workers and site visitors.
13. Moderate public pedestrian traffic should be expected around all work locations. Ladders, scaffold, installation materials, and all other hazardous conditions must be fully protected at all times. Warning cones, barricades, warning tapes, etc. shall be used to warn and protect persons and property at all times in public corridors.
14. Comply with any and all code related and UCB specific safety requirements for work to be performed in confined spaces. The University requires appropriate safety training, physical examination and fit testing for employees working in confined spaces. This shall be provided to Contractor employees at the expense of the Contractor and at no cost to the University.
15. Comply fully with National Electrical Safety Code NESC and UCB specific safety requirements for work in electrical high voltage power manholes. Only licensed electricians may perform work in electrical high voltage power manholes. In addition, a UCB high voltage electrician escort is required to be on site throughout the time work is being conducted by contractors (including standing order electricians) in any high voltage power manholes or vaults.
16. OIT Standing Order contractors shall maintain a safety manual. This manual shall be submitted to the OIT department at the beginning of each contract year.

D7040.27 – IT Workmanship, Warranty and Support

1. Materials and workmanship shall meet or exceed industry standards and be fully guaranteed for one full year from final acceptance for each project. Cable integrity and associated terminations shall be thoroughly inspected, fully tested and guaranteed as free from defects, transpositions, opens/shorts, tight kinks, damaged jacket insulation, etc.
2. Furnish a written warranty to UCB for a minimum of:
    a. Ten-year materials warranty on parts and labor to repair/replace defective telecommunications materials specified herein. This warranty only applies to materials provided by Contractor and does not apply to materials provided by UCB.
    b. Lifetime Application Assurance manufacturers' warranty on Belden Certified Networking Systems. The installer/contractor shall be certified by the manufacturer to provide the materials warranty.
    c. One-year installation workmanship warranty on parts and labor to resolve problems related to telecommunications system installation workmanship.
3. The Contractor shall be responsible for, and make good, without expense to UCB, any and all defects arising during this warranty period that are due to imperfect materials, appliances, improper installation, or poor workmanship.
    a. During the warranty period, provide all labor required to repair or replace defects in the telecommunications system, at no cost to UCB.
    b. During the warranty period, provide new materials to repair or replace defects in the telecommunications system, at no cost to UCB.

D7040.28 Firestops and Penetration Seal Materials

1. All penetrations must be sealed, use qualified systems to firestop through penetrations in all fire-rated walls, floors, and assemblies for pipes, cables, conduits, ducts, inner-ducts, and cable trays.

2. Firestopping for openings through fire-rated walls, floors, and assemblies shall comply with all requirements of UCB Standards Section D7000.26.
3. Cabling for telecommunication applications shall be sealed with re-enterable firestopping products.
4. Firestopping devices shall be pre-manufactured modular devices, containing built-in self-sealing intumescent inserts. Firestopping devices shall allow for cable moves, additions or changes without the need to removed or replace any firestop materials. Devices must be capable of maintaining the fire resistance rating of the penetrated membrane at 0% to 100% visual fill of penetrants; while maintaining "L" rating of <5 cfm/sf at 0% to 100% visual fill. Each device must be capable of retrofit applications and be available in square and round configurations, with single, double, triple and six-plex bracket systems provided. Firestop devices must also allow for plastic pipe, metallic pipe, and mixed multiple penetrations (plastic, metallic, insulated metallic, and cable) though a single device.
5. Inside all conduits, the firestop system shall consist of a dielectric, water-resistant, non-hardening, permanently pliable/re-enterable putty along with appropriate damming or backer materials (where required). The sealant must be capable of being removed and reinstalled and must adhere to all penetrants and common construction materials and shall be capable of allowing normal cable movement without being displaced.
6. Approved Firestop Manufacturers:
    a. 3M Fire Protection
    b. Specified Technologies, Inc. (STI)
    c. HILTI
7. The firestop system shall be submitted to UCB OIT with a list or map of each location and system number used for the project. The submittal shall include a penetration schedule that shows typical penetrations of each penetrating material's type and the proposed firestop system.
8. Submit detailed drawings including manufacturer's descriptive data, typical details conforming to UL Fire Resistance or other details certified by another approved nationally recognized testing laboratory, installation instructions or UL listing details for a firestopping assembly in lieu of fire-test data or report. Submittal shall indicate the firestopping material to be provided for each type of application. When more than a total of 5 penetrations and/or construction joints are to receive firestopping, provide drawings that indicate location, "F", "T" and "L" ratings and type of application.

D7040.29 Examination of Project Site

1. Prior to any project work, the Contractor shall examine the project site carefully, including all project drawings showing existing systems and equipment. The Contractor shall be fully informed of and shall identify all utility, state, and local requirements that will affect the telecommunications work at the project site.
2. It shall be the Contractor's responsibility to determine if the installation of the proposed systems will affect the operation or code compliance of existing systems. With UCB approval, relocate, modify, or otherwise revise existing telecommunications systems as required to maintain operational integrity and code compliance.
3. The Contractor shall become familiar with the local conditions under which the work is to be performed and correlate the on-site observations with the requirements of the specifications and project drawings. No allowance will be made for claims of concealed conditions which the Contractor, in exercise or reasonable diligence in examination of the site, observed or should have observed.

Before ordering any materials or doing any project work, verify all measurements and be responsible for correctness of same. No extra charge or compensation will be allowed for duplicate work or material required

because of unverified differences between actual dimensions and the measurements indicated on the project drawings. Any discrepancies found shall be submitted in writing to the Consultant and the OIT CM for consideration before proceeding with the project work.

Appendices

D7040.131 - OIT Termination Schedule guidelines.

University of Colorado at Boulder OIT Termination Schedule guidelines as of 10-28-20

The layout of the Capital Construction template is now setup with the idea for the design is to be laid out with up to CAD numbers to be used per Main Distribution Frame and Intermediate Distribution Frame (MDFs/IDFs) and 100 CAD numbers for adds at the CD phase. Please keep this in mind when assigning the CAD numbers on the prints as they shall be assigned per Main Distribution Frame and Intermediate Distribution Frame (MDFs/IDFs) not just consecutively around the building. As an example the MDF room shall start with CAD 001 up to 400 and the next terminal room will start at 401 etc. With that said here are the guidelines.

Design CAD numbers will be:

MDF = CAD 001 up to 400	2nd IDF = CAD 401 up to 800	3rd IDF = 801 up to 1200
4th IDF = CAD 1201 up to 1600	5th IDF = CAD 1601 up to 200	6th IDF = 2001 up to 2400
7th IDF = CAD 2401 up to 2800	8th IDF = CAD 2801 up to 3200	9th IDF = 3201 up to 3600
10th IDF = CAD 3601 up to 4000	11th IDF = CAD 4001 up to 4400	12th IDF = 4401 up to 4800
13th IDF = CAD 4801 up to 5200	14th IDF = CAD 5201 up to 5600	15th IDF = 5601 up to 6000
16th IDF = CAD 6001 up to 6400	17th IDF = CAD 6401 up to 6800	18th IDF = 6801 up to 7200
19th IDF = CAD 7201 up to 7600		

Added CAD numbers after CD phase will be:

MDF = CAD 8001 up to 8100	2nd IDF = CAD 8101 up to 8200	3rd IDF = 8201 up to 8300
4th IDF = CAD 8301 up to 8400	5th IDF = CAD 8401 up to 8500	6th IDF = 8501 up to 8600
7th IDF = CAD 8601 up to 8700	8th IDF = CAD 8701 up to 8800	9th IDF = 8801 up to 8900
10th IDF = CAD 8901 up to 9000	11th IDF = CAD 9001 up to 9100	12th IDF = 9101 up to 9200

13th IDF = CAD 9201 up to 9300 14th IDF = CAD 9301 up to 9400 15th IDF = 9401 up to 9500
16th IDF = CAD 9501 up to 9600 17th IDF = CAD 9601 up to 9700 18th IDF = 9701 up to 9800
19th IDF = CAD 9801 up to 9900

One of our goals is to have the Termination Schedule setup so you don't need to change anything in gray on the Termination Schedule sheet, so please let us know if something needs to change. The password will no longer be provided.
You should not have to filling in information for **CATV** but if you do leave the RK column blank, the Panel shall be the block plus "TV". Also know that each tap has only 8 drops so these TV lines shall not exceed the 8 count in the Term Pos.

	MDF								
CAD	IDF	FP Pos	Rk.	Panel	Term Pos.	Room	Mtg	Cat	…
001	210	A		1TV	8	CR101	C	TV	…

The **Mtg** column shall be as follows:
D – Desk drops at about 18" AFF.
W – Wall plate drops for a metal wall plate that will hang a phone and have only one cable to it.
AC – Above counter drops.
C – Ceiling drop which is the designation for outlets that are in the ceiling or a camera drop.
F – Floor drop which includes Floor boxes, tombstones, poke-thru, etc.
EL – For Elevated jacks above the AC level will also include the elevation height AFF for example +60
FJ – Fiber Jack.
VC – Video Camera.

Wireless drops for the Wireless Access Point locations shall follow current mounting and shall be confirmed with the wireless group. These are the current standards as of publication.
WLH – In room Hospitality AP (an AP installed in a Desk jack location)
WLS – Wireless Surface Box
WLSX – Wireless Surface Mount, No Enclosure
WLP – Wireless Pendant
WLW – Wireless 45 Degree Wall Mount
WLWD – Wireless Wall Directional Antenna
WLOS – Wireless Outside Directional Antenna
WLCD – Wireless Ceiling Directional Antenna
WLGM – Wireless Grid Mount
WLDC – Wireless Ceiling Grid with Box

Note: On the prints the wireless has two Mounting type indicators, 1 - a single letter and 2 – WL… and the WL… Mounting type shall be used on the Termination Schedule in the Mtg column. The AP type is not listed on the Termination Schedule.

The **CAT** column shall be as follows:

6 or C6 = Category 6 6A = Category 6A
SM = Single-mode M6 = Muliti-mode 62.5

For horizontal cable terminated on **66 blocks, 110 blocks or 12 port wall panels** list the block in the Rk column and leave the Panel column blank.

MDF

CAD	IDF	FP Pos	Rk.	Panel	Term Pos.	Room	Mtg	Cat	…
001	210	A	2		8	CR101	D	5E	…

For **Century Link** horizontal drops put these on a separate tab and label the MDF/IDF with QW in front of the number.

MDF

CAD	IDF	FP Pos	Rk.	Panel	Term Pos.	Room	Mtg	Cat	…
001	QW210	A	2		8	CR101	D	5E	…

Please complete the Bldg(bldg.#) and Riser columns. All Riser numbers shall be 5 digits.

The first set of Termination Schedule shall be completed at CD phase of the project and in the CD or ASI column place “CD” in this column for every cable listed so for a faceplate with two cables we will have CD for the A and B cable position. For every change with a COB, ASI or RFI the CD or ASI column shall replace the CD text with the relevant abbreviation and number for example COB 063.

D7040.132 - Construction Drawings AS-BUILT Requirements.

Memorandum of understanding between the University of Colorado at Boulder (UCB) Office of Information Technology (OIT), and Contractors to UCB OIT for construction drawings issued for projects on Campus.

1. UCB OIT will issue an AutoCAD set of drawings to the Contractor for “In-House” OIT projects. For Consultant Designed Facilities projects, drawings will be issued by the Architect/Consultant.
2. Contractor must have one full sized set of drawings on the job site for the purpose of marking as-built variations, and another set in their office. Drawings override any verbal statements made prior to or during project walk-through, or during construction. All changes must be are written on the drawing with a UCB OIT signature next to the change.
3. Any changes (i.e. redlines) made to the drawings shall require a UCB OIT signature next to red lines allowing the change to be made. The Contractor may be requested to field verify existing layout. Redlines on the

drawings based on field verification, shall not require a UCB OIT signature next to the red lines, indicate “field verified” next to the red lines.

4. All outside plant copper/fiber and conduit jobs shall have cable and conduit distances noted on the “Cable/Condit Footage and Count Information” sheet. Footages from end-to-end, between splices, and from splice to building fiber termination point in building (relay rack or fiber can) are required. The “SYM” column on the form corresponds to the fiber and copper designation bubbles on the topo drawings. Conduit type and length shall be noted on the topo drawings.
5. UCB OIT will conduct an as-built walk-through with the Contractor prior to project completion. During this walk-through a punch list will be developed and the accuracy of the red line changes will be determined.
6. As-built drawings for Consultant Designed Facilities projects shall be returned to the Architect/Consultant (or General Contractor depending on the project). Copies of the floor plans (i.e. jack maps) and jack position sheets shall be given to UCB OIT prior to returning as-built drawings to the Architect/Consultant per this division standard.
7. All drawings issued by UCB OIT for In-House projects shall be returned to UCB OIT, whether or not as-built modifications (red lines) were made to the drawings. All red lines from the field set of drawings shall made to the original AutoCAD set of drawings using an AutoCAD editor, and returned to UCB OIT. The contractor must turn in the field copy with the red lines and an updated DWG set as their As-builts.
8. UCB OIT maintains the right to return drawings to the Contractor for correction if information is incorrect or missing.
9. The statement “Completed Per Print” is not acceptable.

Last document update was October 15, 2020.

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Contractor’s signature