



## JOINT HOUSE RULES POLICY CRITICAL ENVIRONMENT WORK RULES

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### APPLICABILITY

These work rules are applicable to persons conducting work in Uniti Data Center common areas or Tenant spaces managed by Uniti Fiber.

### GENERAL

1. Fire detection and suppression systems
  - a. Pre-action water sprinklers protect the computer rooms, office and support spaces. The sprinklers will function automatically when the temperature exceeds a preset level and the fire detection system is in alarm. Every effort shall be made to prevent such a condition from ever occurring.
    - i. A Very Early Smoke Detection Apparatus (VESDA) system monitors all computer room raised floor areas. VESDA is a very, very sensitive smoke detection system and provides early warning of fire, which may allow trained personnel to find the source of heat (sometimes as small as a smoking resistor on a printed circuit board or an overheated motor) before it triggers the fire suppression systems.
    - ii. Certain tenant spaces may have gaseous suppression systems. Such systems can safely suppress a fire before the water sprinklers are activated, but must reach sufficient gas concentration levels to be effective. Keeping all openings sealed (especially at floor level) and all fire doors closed is absolutely essential. See tenant-specific work rules for more information.
  - b. Fire rated doors must never be propped open. Leaving fire doors open can help fires to spread and can prevent the gas from reaching sufficient suppression concentration. Leaving doors open also affects computer room temperature, humidity stability and security.
  - c. A fire watch shall be established any time a fire detector, alarm system, or suppression system is disabled. A fire watch requires a complete physical tour of all spaces in the de-activated fire detection zone at least once every two hours. Technicians shall not be permitted to leave the site until all fire systems have been re-enabled.
2. Chain of command and call lists are critical in an emergency. See the following section for more details.
3. Requirements for Working At This Site
  - a. Starting and completing work each day
    - i. All work shall take place at a time designated by Data Center Operations (DCOM) Staff. On arrival at the site, vendors and contractors shall announce their arrival to the DCOM and determine it is still ok to proceed with planned work.
    - ii. Pre-plan the tools and materials required for each day's work.
    - iii. Do not set things on top of equipment or block access to any aisle ways, doors, air conditioning, Power Distribution Units or electrical panels.
    - iv. Replace all floor tiles at the end of each day.
    - v. Do not cross protective barriers or devices without asking permission. Be especially aware in areas where floor tiles may be removed, exposing the underfloor area.

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- vi. The dock area is for unloading only - no parking is permitted. Vendor trucks are to be parked in unmarked spots. Vendor trucks may not be parked in Visitor or Reserved spots.
- vii. All packing material must be removed from computer equipment/components in the specified staging areas before being moved onto the active data center space.
- viii. Nothing shall be stored in the computer room or under the raised floor.
- ix. Removal of a computer room raised floor tile or ceiling tile must be authorized by DCOM Staff. Be especially mindful of cabling, smoke detectors, sprinkler heads, water leak detection systems, and other sub-floor devices and equipment, which can be damaged. DCOM will disable the fire detection and suppression systems when certain types of sub-floor and above-ceiling work are to be performed.
- x. Tools or instruments identified in a method of procedure (MOP) as requiring calibration must have been calibrated within the required time period and have a label indicating the calibration date.
- xi. Consult DCOM Staff before bringing Glycol, pressurized refrigerants or any other liquids or chemicals into the building.
- xii. Paints, solvents, adhesives, or any other flammable materials brought inside the building must be kept to a minimum and shall be stored in metal fire-rated cabinets when not in use.
- xiii. Any maintenance equipment that generates audible noise (floor buffers, etc.) can be used only with prior approval.
- xiv. You may not use UPS outlets. See DCOM Staff for appropriate outlets to use.
- xv. All work materials and parts must be properly stored at the end of the day.
- xvi. Penetrations to rated firewalls or smoke barriers must be sealed with an approved material (e.g. – Fire Stop Silicon) on a daily basis.
- xvii. Contract workers shall not leave at the end of the day or job until they have been released by an authorized DCOM staff member.
- b. Initiating a project
  - i. All work affecting or potentially affecting critical systems shall be scheduled through Change Control. Approved MOPs are required on all critical work. A qualified vendor foreman or supervisor must be on site and “in-charge” at all times during critical work.
  - ii. Any deviations from the approved work scope must be evaluated by the authorized DCOM staff member prior to work performance. Changes affecting safety or risk shall be re-scheduled through Change Control.
  - iii. Use of the dock, storage of equipment, materials and tools shall be discussed with DCOM Staff prior to start of a project. Agreement shall be reached on hours of loading/unloading, duration of dock use and storage arrangements.
- c. Closing out a completed project
  - i. Work must be done to the satisfaction of DCOM Staff.
  - ii. All temporary or interim measures must be replaced with permanent measures. All wall penetrations must be permanently sealed, tools and materials must be removed and as-built documentation must be completed.
  - iii. The entire work area must be clean—preferably cleaner than found.



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- iv. MOP paperwork must be closed out.
- d. Essential documents for working in this facility
  - i. Methods of Procedure. The approved MOP must be posted in the work area and visible where critical work is being performed. Work shall be immediately halted if the approved MOP is not posted or is not being followed.
  - ii. Hot Work Permits. No welding or open torches shall be used without a permit and without disabling the fire detection and suppression systems in the zone affected.
  - iii. Materials Safety Data Sheet (MSDS). Provide a Materials Safety Data Sheet for any material you bring into the facility. The MSDS shall be kept in the Security office.
  - iv. Other documents may be required depending upon the work to be performed.

### **DCOM DATACENTER CHAIN OF COMMAND**

1. In the event of a Building emergency DCOM Management and Security will assume incident command, communicate with emergency responders and Tenants.
  - a. In the event of a fire alarm, all employees, vendors and contractors are to evacuate the building. Assigned Tenant personnel, and vendor foremen or lead persons are responsible for checking their department's personnel and reporting to DCOM Security that their people are out of the building.
  - b. It is a good practice to always make sure you are aware of the nearest fire exit.
2. In the event of an emergency, do not congregate in the area of the problem unless you can make a direct contribution to solving the problem. In a facilities emergency, the available staff shall be divided into those solving the problem according to a planned protocol and one person who shall be assigned to communicate the status of problem and its resolution to responsible others.

### **CALL LIST**

<b>Function</b>	<b>Person</b>	<b>Office</b>	<b>Mobile</b>
DCOM Security	NOC Personnel	877-652-2321	
DCOM Management	Hunter Payne	251-510-8572	251-510-8572
Fire Department	Emergency Dispatcher Normal Business	911	
Police Department	Emergency Dispatcher Normal Business	911	

### **EMERGENCY TELEPHONES AND DATA COMMUNICATION**

1. Common area telephones pass through the building key system. The conference room phone and the fax machine phone go directly to the Central Office. These

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circuits can be used to provide communications if the PBX fails.

2. Some facilities support equipment has the capability of modem connection for remote diagnostics or operation. Modems may be plugged in only when an authorized DCOM staff member is present. Connections must be unplugged upon completion of the work.

### COMPUTER ROOM SPECIFIC WORK RULES

1. All work to be performed on or under the computer room raised floor, in the ceiling or on any related infrastructure support equipment must be scheduled through Change Control if it has any potential for impacting computer operations. Exceptions shall only be granted by the DCOM Management on a case by case basis.
2. Do not touch any equipment unless it is specifically identified in your MOP.
3. Pipe cutting, pipe threading, cement cutting or other drilling within the computer room is only permitted if it cannot be done outside the room. In such cases, the MOP will include precautions to control dust, metal shavings and/or fluids.
4. Be careful to identify and carefully manage any physical changes or penetrations that affect where leaking water will flow. Seal penetrations between floors that might allow water to leak through to the floor below.
  - a. Where applicable, underfloor leak detectors are provided to sense the presence of water. Be careful to make sure at the completion of your work that these detectors remain in the path of water flow at the lowest point where water might be expected.
5. Gunpowder discharge activated construction tools or devices are not permitted.
6. Raised floor tile rules
  - a. Remove no more than 5 raised floor tiles at any time in any one area. This will ensure maximum static pressure and structural stability of the raised floor. Close open tiles as soon as possible, no later than the end of each day.
  - b. Use safety cones, barricades, caution tape, or other safety equipment or devices to direct people away from areas where a floor tile is removed and the underfloor area is open with the potential for someone to fall.
  - c. To protect floor surfaces in hallways and computer rooms from being damaged when moving heavy computer equipment, use ¼" tempered Masonite sheets taped with 3" duct tape at all seams. Steel plates may be required if the equipment being moved is heavy enough (over 300 pounds) to require weight redistribution to prevent floor collapse - Masonite by itself will not be sufficient.
  - d. Minimize the size of cable cutouts to limit the unnecessary loss of cooling air and static pressure.
  - e. Cutouts in floor tiles must be protected with permanent plastic trim strips to prevent cables from rubbing against raw or rough metal edges.
  - f. Replace all previously cut floor tiles no longer needed for cable penetrations with solid tiles to prevent loss of static pressure and to increase the efficiency of the cooling system.
  - g. The location of perforated floor tiles that deliver cool air from under the raised floor is critical to maintaining static pressure and proper computer room cooling. Perforated floor tiles are to be located only in accordance with the master plan established by DCOM. Moving a perforated floor tile without first consulting

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DCOM is a serious offense.

7. Equipment installation standards
  - a. Install all computer equipment above the white floor tiles.
  - b. Keep all peripherals, terminals, consoles, modems, keyboards, and other types of moveable computer and communications equipment within a cabinet or rack specifically designed for the purpose. Do not use tables or desks for this purpose.

### **SAFETY, "HOT WORK," LOCK-OUT AND TAG-OUT PROCEDURES**

1. All work activity must comply with NEC, NFPA, OSHA, and applicable safety codes as identified by the local Authority Having Jurisdiction (AHJ). It is important that a proactive and consistent communication be established with the AHJ and Fire Department to help them understand the critical uptime requirement for the data center.
2. Safety cones with caution tape must be erected around all hazardous work areas prior to the start of work. Signs must be posted with the cones instructing people to avoid this dangerous work area.
  - a. Be safe!
    - i. When in doubt, ask!
    - ii. Be sure you thoroughly understand what you are going to do before you proceed. You may not have a second chance to correct a mistake.
    - iii. When in doubt be conservative!
3. Avoid safety cones, barricades, caution tape, or other safety equipment that has been installed to guide you around hazardous areas including open floor tiles.
4. Electrical "Hot" work requires at least two CPR-trained electricians and all associated safety equipment appropriate for the voltage being worked on (to include at least a safety hook and insulated mats). Arc Flash precautions must be followed where applicable. All applicable personal protective equipment must be worn. An Energized Electrical Work Permit, as required by NFPA 70E, must be thoroughly completed and fully executed for each hot work activity.
5. Service technicians and mechanics must provide their own equipment locks and tags, which comply with the facility standard. Each tag must be filled out properly and legibly.
6. A DCOM Staff representative must be present for any component to be locked out.
7. The DCOM Staff representative for the project must be present before unlocking any tagged out piece of equipment. Log all actions in the DCOM Staff permanent TAG OUT LOG.
8. Electricians must always use insulated tools and wear safety glasses. Hats and jewelry shall not be worn. Arc flash requirements must be adhered to where applicable.
9. OSHA standards must be strictly adhered to for Bloodborne Pathogens and for all other hazardous or toxic materials. Immediately notify DCOM Staff of any contamination.

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### METHOD OF PROCEDURE (MOP)

1. Over 50% of all data center site infrastructure failures are coincident with maintenance or other human activity. To control the risk of an unintended failure, a MOP is required for all work that may even remotely affect computer operations. DCOM Staff is responsible for determining which infrastructure system work activities shall require a MOP. The MOP may be prepared by DCOM Staff or by the outside vendor performing the work. DCOM Management is required to sign off on the MOP.
2. A Tenant Work Procedure Plan (WPP) or MOP is an acceptable alternative to a DCOM MOP form for work occurring in common areas – so long as all applicable requirements are addressed.
3. The MOP shall include a summary, in non-technical terms, of the work to be done, the expected work duration, the planned time and date, and the potential downtime risks (utilizing the DCOM Data Center's risk level definitions).
4. The MOP shall contain a "back-out" paragraph which discusses what shall happen if unexpected conditions are encountered, who shall make the decision of what to do, and how original conditions can be restored. Part of this paragraph shall identify at what point it is no longer possible to back-out from the work that has already been done.
5. The MOP shall also identify the work to be done in elaborate technical detail, as a "script", including the tools required, the skill level of the people doing the work, and a detailed work sequence checklist itemizing the steps to be performed.
6. Each step on a MOP Checklist shall have a space for one of the people doing the work to initial that they have followed each detail of the MOP, as the work progresses. There shall also be room for written comments to be recorded.
7. Finalized MOPs shall be generated at least two weeks before the work activity to allow Change Management. MOPs for activities potentially impacting certain Tenants may take longer – depending on the Tenant's change management procedures.
8. Any activity important enough to require a MOP shall require at least two qualified people to perform the work. The first person is responsible for performing the work and the second person is responsible for reading and checking each step on the MOP checklist, to assist the first person, and to provide safety backup. A consistent team must perform all circuit breaker installation/de-installation work.
9. Prior to initiating any work, the second person shall read the next step on the MOP Checklist. The first person will read back that step on the MOP Checklist, indicating they understand what is required. When the step is completed, the second person shall check the work and personally initial the MOP Checklist to confirm the step has been completed. Then, the sequence starts over with the next step on the MOP Checklist. The objective of initialing each step is to intentionally slow down the pace of critical steps to prevent doing things out of sequence.
10. Work in progress is to be stopped if the MOP sequence appears to be incorrect or cannot be followed.
11. Equipment not specifically listed in the MOP may not be touched for any reason.
12. If a failure occurs as a result of work covered by a MOP, the process shall be exhaustively studied by all involved along with uninvolved individuals to identify the root cause. The only possible root causes are process errors, execution errors, or accidents. For the failure to be considered an accident, 1) the MOP must have been



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correct, 2) the MOP must have identified the risk which actually occurred, and 3) it must be verified that the steps in the MOP were thoroughly followed. (Analysis of previous failures indicates that most were the result of inadequate process or execution errors. The reason for an MOP and this Procedures document is to avoid these types of problems.)

13. Each MOP shall be reviewed upon the completion of the work activity to determine if minor edits are needed. If so, the MOP shall be updated within one week (or before the next work activity, if sooner).
14. An authorized DCOM Staff representative must be present during the performance of all MOPs.
15. While working on a MOP controlled project, vendors shall not leave the site until released by DCOM Staff.

### CRITICAL POWER

1. The critical power distribution system takes conditioned power from the Uninterruptible Power Supply (UPS) system and distributes it throughout the facility to individual loads. Most site failures occur in this area where hot (live) electrical work is required and it is difficult to perform physical maintenance. Frequent problems include:
  - a. dead front cover slipped while accessing load panel
  - b. overloaded breakers which trip unexpectedly
  - c. wires which are not physically secured under screws
  - d. screws which are not torqued adequately
  - e. wires or circuit breaker handles which are dislodged while adjacent work is being performed
  - f. stripped screws
  - g. skinned insulation, faulted wires
  - h. reversed rotations
2. A Method of Procedure (MOP) and at least two qualified electricians (both must be CPR qualified) are required whenever any type of hot or "live" electrical work is performed. A contractor should never operate a circuit breaker without direct authorization from DCOM Staff.
3. Access to critical power distribution components including electrical panel boards, RPPs, and PDUs is restricted and all panels should be locked. Contact DCOM Staff for access.
4. Electrical installation standards
  - a. Non-metallic fish tapes shall be used for all electrical work.
  - b. All circuits (electrical or non-electrical i.e. coax, bus & tag, fiber optic, etc.) must be dedicated home runs, with no splices or intermediate plugs or connections, unless specifically authorized by DCOM Staff.
  - c. All flexible electrical conduit in the computer room shall be watertight and terminate in a female twist lock receptacle unless the circuit is hardwired directly to the hardware. Flat spade plugs and receptacles are not allowed in the computer room unless the plug and receptacle are tie-wrapped together using three tie wraps, or contain a clamp built into the receptacle. DCOM Staff shall demonstrate a suitable process for physically securing plug/receptacle

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- connections. Immediately report any computer room hardware with flat-spade push type plugs that have not been tie-wrapped to Facilities.
- d. All breakers must be bolt-in type and have a trip notification feature.
  - e. Power for rack or cabinet mounted equipment must be dedicated to that rack or cabinet. (Connecting power between adjacent racks or cabinets is not permitted because it has the potential for overloading a circuit. It also has the potential for unexpectedly removing power in the subsidiary rack when the primary rack is shut off for maintenance.)
  - f. Independent (standalone) micro-UPS systems are not permitted in the computer room or anywhere in the critical power distribution chain.
  - g. Equipment power cable length must be kept to a minimum and strain relief provided within 12" of either end of cables. Then the cable must be raised off the sub-floor and tied off at the stanchion or stringer.
  - h. Clearly label source and connected device on all power cables with permanent tags.
  - i. Install UPS receptacles using a standard orange outlet that is elevated from the sub-floor. Use standard (beige or gray) for house power.
  - j. When providing dual power distribution, use standardized contrasting colors to identify separate UPS power sources at all points.
  - k. When purchasing new PDU equipment, specify hinged panel covers.
  - l. All power strips must be located above the raised floor where they can be seen and permanently attached to the cabinets. In-rack power strips are preferred. Power strips shall not be daisy-chained; i.e. one power strip cable plugged into a receptacle on another power strip to provide additional outlet receptacles. Each power strip should be a dedicated home run back to its own source of power.

### HOT WORK PERMITS

1. You must acquire a Hot Work Permit from DCOM Operations or Security for any temporary operation involving open flames (or which produces heat and/or sparks) in the building. No welding or cutting should ever be performed within the raised floor area if it may be avoided.
2. DCOM Staff must sign the Permit for work in Common Areas or DCOM-managed Tenant areas. For work occurring in other Tenant areas, the Hot Work Permit must be completed and signed by the Tenant-approved work supervisor.
3. Follow the instructions on the Permit. Be sure to adhere strictly to the Precautions Checklist contained on the Permit. A copy of the Permit should stay with DCOM Security.
4. You must implement a means of ventilating smoke from the area that is approved by DCOM Staff.
5. Notify DCOM Staff upon completion of the work.

### MECHANICAL WORK

1. The vendor's Supervising Technician/Mechanic must be a qualified Journeyman with previous experience within the Data Center, unless otherwise specified by DCOM Staff.
2. All work must be performed by a qualified Journeyman.

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3. Before any work can begin, the Supervising Technician/Mechanic must notify DCOM Staff, so an escort/observer may be provided.
4. Remove no more than 5 raised floor tiles from any area at one time. This will preserve static pressure, prevent the raised floor from shifting or collapsing, and minimize the risk of people or equipment falling through. Mark all open floor tiles with safety cones or other barriers.
5. No open torches or welding equipment are permitted in the building unless a Hot Work Permit has been approved.
6. Only DCOM Staff may authorize valves to be turned on or off.
7. When draining a pipe or line, use hoses to bring the water to a floor drain. When laying out and retrieving the hose lines, be especially mindful of not disturbing cabling, fire detectors, electrical connections, and other equipment or spilling water left in the hose or pipe.

### **CLEANUP AS WORK PROGRESSES**

1. Remove all trash and debris from the site daily. Keep work areas tidy while work is in progress.
2. Clean all areas where work is being performed of tools, equipment, and debris at the end of each shift. Store tools and equipment as directed.
3. Clean all work areas using a HEPA vacuum or damp mopping with an absolute minimum amount of water and cleaning solution. Dry all spills. Be sure to handle chemical spills appropriately.
4. Leave the work area "cleaner than found." Clean any dirt or debris regardless of its source or origin.
5. Sticky "Walk-off" mats should be provided at all points of egress from the work area. Change the mats when they are loaded.

### **VACUUMS**

1. To limit the amount of airborne particles, all vacuums used in the data center shall have a HEPA discharge filter capable of limiting discharged particles to 0.3 microns. Brooms and unfiltered "Shopvac" can create large quantities of air borne contamination which can be drawn into computer equipment (or which can set off the fire detection system) and are specifically prohibited. Computer hardware is very sensitive to contamination.

### **DELIVERIES/SHIPMENTS, DOCK PROTOCOLS, COMPUTER EQUIPMENT PACKING/UNPACKING, AND STORAGE**

1. Notify DCOM Staff in advance of any expected large shipments or deliveries. This will aid in delivery coordination.
2. DCOM staff and Security will follow the "Managed Services Receiving Procedure" for all deliveries to the Data Center.
3. Do not store anything in hallways. This includes computer equipment, tools, equipment, materials, parts and components.

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### **INSTALLATION/REMOVAL OF COMPUTER EQUIPMENT NON-ELECTRICAL CABLES**

1. An approved MOP and Change Control approval must be obtained before starting to install or remove non-electrical cables (fiber optic, coaxial, bus and tag, communications, phone, etc.). All work in Tenant areas must be done in accordance with Tenant's requirements. Existing cables should not be pulled, stretched, or disturbed under any circumstances.
2. Place all fiber optic cables inside the fiber optic conveyance system.
3. Be sure to properly support any cables run above the dropped ceiling. Do not attach or tie off cables to sprinkler pipes, sprinkler heads, ceiling grid, ceiling hangers or smoke detectors.
4. Two people must work together at all times for the removal of non-electrical cables. First carefully trace all cables to identify what is inactive, then cut the inactive cables one at a time in sections no longer than 10-15 feet. Then unweave and remove the cut pieces. Do not cut, disturb or pull on existing cables while removing other cables.
  - a. In congested areas, conduct cable removal only with the active assistance of the operators of the equipment (who can restore uptime in the event you inadvertently pull loose a single wire required for equipment operation).

### **INSTALLATION OF COMPUTER EQUIPMENT POWER CABLES AND CIRCUIT BREAKERS**

1. Pre-planning activities
  - a. Computer Operations shall create a Work Order containing the following elements
    - i. A summary sheet describing the work to be done and the date and times requested for the work.
    - ii. Computer Operations and Facilities shall perform a walk-through of the areas where installation work will be performed. During the walk-through, a separate work order sheet shall be completed for each piece of equipment, to include a description of the work to be performed, heat load, power requirements, receptacle types, floor tile cutout type, specific floor tile location where the equipment will be located, installation and commissioning details and any other special instructions. Identify whether the equipment is dual powered. If the equipment does not have dual power functionality, Computer Operations must sign off that they understand it will operate at increased risk. Provide computer hardware equipment identification information so labels can be prepared and computer equipment properly labeled by Facilities once the power connection is completed.
  - b. Facilities shall use the Work Order information to determine if sufficient power from the correct source is available. All electrical infrastructure systems shall be verified for capacity, to include the ability for one power source to "fail over" to the other. If existing capacity is available, Facilities shall assign a PDU, a panel board within the PDU or RPP, and a circuit breaker position within the panel board. Facilities shall verify that the electric panel and circuits are properly marked. If adequate capacity is not available or the dates are unrealistic, Facilities shall inform Computer Operations.

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- c. Facilities shall prepare the power cable assemblies ahead of time and outside the computer room (if at all possible). Facilities shall make sure the power cable assembly:
  - i. Complies with NFPA 70 (NEC), safety codes, local codes, and OSHA.
  - ii. Is hardwired directly to the computer hardware or uses twist locks (further secured by tie-wraps as a secondary securing method, as identified in Critical Power section 4c).
  - iii. Is tested for wire continuity, wire insulation nicks or grounds, receptacle wiring and, if applicable, phase rotation.
  - iv. Has permanent identification labels on the conduit 24" to 48" from each end. The labels shall be identical and shall indicate the specific load being served, its floor tile location, the PDU or RPP power source and its floor tile location, the PDU or panel number and the circuit breaker number within the panel. Junction boxes should be labeled with indelible markers.
- d. Facilities shall check all service clearances around the PDU, RPP, or load panel to ensure there is room to work safely.
- e. Computer Operations or Facilities shall acquire Change Control Approval prior to Facilities installing any power cable assemblies or turning ON previously installed circuits.
- f. A MOP shall be created for the work planned.
- g. Computer Operations and Facilities shall perform a walk through (rehearsal) of all steps in the MOP. A back-out plan shall be part of the rehearsal.
- 2. Schedule work under the raised floor and in the PDU or RPP only when you have received Change Control Approval. At least two individuals must be present for this work.
  - a. Anyone involved in the work activity may halt the work at any time due to a safety concern.
  - b. Comply with all installation procedures:
    - i. Open only every other floor tile along the cable route (to a maximum of 12 feet) during installation to prevent mishaps.
    - ii. Handle all cable pulls in short runs of 12 feet maximum, following perpendicular routings under the colored floor tiles.
    - iii. Install conduit in a way that does not block future conduit installations
    - iv. Lock newly installed circuits off within the panel and wrap the receptacle with yellow tape (to prevent unauthorized use). The yellow color indicates the receptacle is specifically intended for a future use.
    - v. Dedicate and identify equipment ground, isolated ground, and neutrals. Label wires in panels with circuit identification.
    - vi. Double-check dual powered equipment feeds to ensure power is routed via different paths from different sources. Never install both dual power feeds to a device from the same PDU.
    - vii. Utilize standardized contrasting colors for cables and conduit from separate (A&B) power paths.
    - viii. Check for shorts or opens using a megohmmeter, phasing, and plug orientation before energizing any circuit.
    - ix. Only an authorized Facilities representative may energize a computer

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hardware circuit. Those authorized to energize and de-energize circuits are listed in the Facilities office. The Facilities representative shall personally tie-wrap twist lock plugs and receptacles together in the approved manner to prevent future inadvertent disconnection.

- x. Facilities shall immediately update the existing Panel schedule (within the panel) and record the initials of the person doing the work and the date.
- c. Facilities shall enter all “as-built” computer equipment and circuit information in the master PDU or RPP panel schedule program immediately upon completion of work. Enter the physical tile location where the power cable assembly actually terminates. Facilities shall create new Panel schedules and computer equipment labels (with power source information) and install them on the PDU or RPP and computer equipment by the end of the next business day.

### REMOVAL OF COMPUTER EQUIPMENT POWER CABLES AND CIRCUIT BREAKERS

1. Computer Operations shall create a formal Work Order containing the following elements:
  - a. A summary sheet describing the work to be done and the date and times expected.
  - b. A separate sheet for each piece of equipment identifying the floor tile location, the equipment to be removed, and any special instructions.
  - c. A floor plan identifying the floor tile locations for each piece of equipment to be disconnected.
  - d. A MOP shall be created for the work planned.
2. Computer Operations or Facilities shall use the Work Order information to request Change Control Approval.
  - a. Computer Operations and Facilities shall perform a walk through (rehearsal) of all steps in the MOP. A back-out plan shall be part of the rehearsal.
3. Schedule work under the raised floor and in the PDU only when you have received Change Control Approval. Comply with these procedures:
  - a. Anyone involved in the work activity may halt the work at any time due to a safety concern.
  - b. Do not disconnect any plugs or turn off an active circuit until two Facilities staff members have independently determined the circuit is inactive. This involves both:
    - i. tracing the cable and determining nothing is connected to the other end and;
    - ii. testing the circuit using a clamp-on ammeter and determining that no current is flowing.
  - c. Once the circuit has absolutely been determined to be inactive by two people, a Facilities staff member shall open the circuit breaker and:
    - i. Tape the circuit breaker open and lock it if possible
    - ii. Update the panel schedule
  - d. Do not leave any inactive power cable assemblies under the raised floor. All inactive power cable assemblies must be removed once the circuit breaker feeding them has been turned OFF.
    - i. At least two qualified people are required to work together to remove power



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- cable assemblies.
- ii. Open only every other floor tile along the cable route (to a maximum of 12 feet) during removal to prevent mishaps. Fewer tiles should be removed if static pressure cannot be maintained.
- iii. Handle all cable removals in short pulls of 12 feet maximum.
- v. Remove decommissioned equipment and power cables from the computer room at the end of each shift.
- e. Enter all modified computer equipment and circuit information in the master PDU or RPP panel schedule program immediately upon completion of work. Create new Panel schedules and install them within the PDU or RPP immediately upon completion of work.