ARNEC Version 2

U.S. ARMY RESERVE

NETWORK ENTERPRISE CENTER

INFRASTRUCTURE

TECHNICAL CRITERIA

Distribution authorized to U.S. Government agencies and their contractors, for administrative and operational use, 27 November 2024. Refer other requests for this document to USARC CIO/G-6.

FOREWORD

This criterion is a living document and will be periodically reviewed and updated. As part of the Army Reserve's responsibilities to provide technical criteria for layer 1 infrastructure design and construction, this document and all updates will be made available to all authorized users. The proponent for Army Reserve Information Technology is USARC CIO/G-6. Development and maintenance of this criterion is the responsibility of USARC CIO/G-6, in coordination with ARIM-D, USACE, and ISEC.

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IMPORTANT NOTE: This criterion has undergone a major re-organization and re-format. A specific record of changes from the previous version of this criterion will not be provided. It is recommended that all users of this criterion carefully review this entire document.

Contents

1. Introduction and General Requirements

1.1. Purpose and Applicability of this Document

1.1.1. The purpose of this document is to define Army Reserve standards and requirements for telecommunications infrastructure. Specifically, standards and requirements for new construction and modernization of existing facilities. This document defines the requirements needed to ensure consistent, compliant design and construction of telecommunications infrastructure throughout the Army Reserve.

1.1.2. Army Reserve telecommunications strategy will evolve over time and individual facilities may have unique requirements. The USARC CIO/G-6 Network Enterprise Center (NEC) (hereinafter referred to as "the NEC") reserves the right to issue Infrastructure Criteria Update Bulletins as needed. These bulletins will be used to supplement this document. The NEC has the responsibility for authorizing individual criterion updates, as well as additions to or variations from the criterion contained in this document.

1.1.3. The NEC is the proponent for all telecommunications infrastructure requirements and shall participate in project scope review, pre-design, charrette, and design meetings to review and define the infrastructure requirements for these projects. The NEC is also the Army Reserve proponent for quality assurance (QA) inspections for all initiatives, projects, efforts, etc. involving telecommunications infrastructure.

1.1.4. This criterion is a required document and must be included and complied with in the design and specifications for all projects. Any deviation from this criterion must be approved by the NEC.

1.1.4.1. For clarification on relationship between this criterion and Unified Facility Criteria (UFC) 3-580-01 (Information and Communications Technology Infrastructure Planning and Design), the following is to be adhered to:

1.1.4.1.1. UFC 3-580-01 is the overarching governing document for information and communications technology (ICT) infrastructure design and construction.

1.1.4.1.2. This criterion supplements UFC 3-580-01 with telecommunications infrastructure requirements unique to the Army Reserve.

1.1.4.1.3. The NEC Infrastructure Team Lead will address any conflicts between UFC 3-580-01 and this document.

1.1.4.1.4. Refer to UFC 3-580-01 for all requirements not specifically addressed in this criterion.

1.1.5. This document does not supersede any contract for design or construction of any individual Army Reserve project. If conflicts exist between this document and a contract, the conflict must be brought to the attention of the contracting officer for resolution.

1.2. Strategy for Delivery of Telecommunication Services for Army Reserve Facilities

1.2.1. For Army Reserve facilities not located on a Base/Post/Camp/Station, USARC CIO/G-6 NEC will provision telecommunication services.

1.2.2. For Army Reserve facilities located on Army installations, the local installation NEC will provision telecommunications services.

1.2.3. For Army Reserve facilities located on any other type of installation (e.g., Army National Guard Camp, Air Force Base, Naval Station), USARC CIO/G-6 NEC will provision telecommunication services to the installation demarcation point. The service will then be extended through the installation's distribution backbone cabling system.

1.3. Telecommunications Submittals and Qualifications

1.3.1. All design submittals require a separate section labeled Information and Communications Technology. All telecommunications design drawings, including site plan, building interior, and all associated drawings shall be included in this section.

1.3.2. At a minimum, provide the following drawings in the final design submittal.

1.3.2.1. Telecommunications Site (TS series) Drawings.

1.3.2.1.1. Site Plan.

1.3.2.1.1.1. Outside plant (OSP) pathways.

1.3.2.1.1.2. Concrete encasement areas and details.

1.3.2.1.1.3. Maintenance holes and/or hand holes.

1.3.2.1.1.4. Service provider point of connection (SPPOC) location and type (e.g., pedestal, pole, hand hole).

1.3.2.1.2. Enlarged duct bank details.

1.3.2.1.2.1. Direct buried.

1.3.2.1.2.2. Concrete encased.

1.3.2.1.3. Enlarged maintenance hole and/or hand holes details.

1.3.2.1.3.1. Accessories

1.3.2.1.3.2. Butterfly diagrams

1.3.2.1.4. Enlarged exterior building entry point details.

1.3.2.2. Telecommunications Building (T series) drawings.

1.3.2.2.1. General notes.

1.3.2.2.2. Symbols legend. The symbols legend shall include the symbols legend from appendix C of this criterion and add other symbols as needed for the project.

1.3.2.2.3. Composite floor plan for each floor with serving area(s) indicated.

1.3.2.2.4. Building area floor plans. For each building area, include separate floor plans for the following:

1.3.2.2.4.1. Cable tray and backbone cabling distribution conduit.

1.3.2.2.4.2. Telecommunications outlets.

1.3.2.2.5. Enlarged Telecommunications spaces.

1.3.2.2.5.1. Aerial (overhead) plan. Show clearances from front, rear, and each side of the rack(s) to the wall.

1.3.2.2.5.2. Wall elevations (all 4 walls).

1.3.2.2.5.3. Rack and/or cabinet elevations (both front and rear of each rack and/or cabinet).

1.3.2.2.5.3.1. Provide detailed elevations of racks and cabinets indicating arrangement, wire management, power, equipment provided by the project, and space allocated for government furnished government installed (GFGI) equipment.

1.3.2.2.5.3.2. Show termination and connection of OSP and ISP backbone cables.

1.3.2.2.6. Telecommunications Bonding.

1.3.2.2.6.1. Enlarged details for primary busbar (PBB), secondary busbar (SBB), and rack bonding busbar (RBB).

1.3.2.2.6.2. Bonding riser diagram to include the telecommunications bonding conductor (TBC), telecommunications bonding backbone (TBB), and backbone bonding conductor (BBC).

1.3.2.2.7. Enlarged Faceplate(s).

1.3.2.2.7.1. Faceplate type.

1.3.2.2.7.2. Outlet type/color/termination type.
1.3.2.2.7.3. Blank inserts.
1.3.2.2.8. Enlarged floor-box and poke-through box plans and details.
1.3.2.2.9. Labeling details.
1.3.2.2.10. Cable tray support details.
1.3.2.2.11. Backbone Cabling Riser Diagram.
1.3.2.2.11.1. Indicate cabling type, strand or pair count, and termination type (fiber optic cable only).

1.3.3. Design drawings and specifications must be reviewed and approved by an active Building Industry Consulting Service, International (BICSI), Inc., Registered Communications Distribution Designer (RCDD). Certified final and release for construction design drawings and specifications shall be stamped by an active BICSI RCDD indicating their review and approval.

1.3.4. Shop drawings must be reviewed and approved by an active BICSI RCDD. Shop drawings shall be stamped by an active BICSI RCDD indicating their review and approval.

1.3.5. The on-site foreman assigned to the installation of the telecommunications infrastructure system or any of its components shall be an active BICSI Registered Cabling Installer, Technician Level with a minimum of 5 years of experience in the installation of low-voltage cabling systems. Alternatively, an RCDD with a minimum of 5 years of experience managing the installation of low-voltage cabling systems can serve as the on-site foreman. All other personnel assigned to the installation of telecommunications systems must have a minimum of 3 years of experience in the installation of low-voltage cabling systems and its components. It is preferred that these personnel have a minimum of an active BICSI Registered Cabling Installer, Level 1. Documentation of current BICSI certification for the on-site foreman must be provided.

2. Telecommunications Spaces

2.1. Space Types

2.1.1. Descriptions and requirements for Army Reserve telecommunications spaces are found in the United States Army Reserve (USAR) Design Guide USAR Facilities. The information for telecommunications spaces listed in this document is in addition to what is specified in that criterion.

2.1.2. Telecommunications spaces are not required in buildings with no telecommunications requirements (e.g., Unheated Storage Building).

2.1.3. Entrance Facility (EF)

2.1.3.1. Each site or campus shall have only one EF (a.k.a. DEMARC).

2.1.3.2. The EF is typically located in the main training building. However, the EF location can vary depending on the needs of the site or campus.

2.1.3.3. When a Reserve Center is located on a military installation, camp, post, or station, the location of the site DEMARC shall be determined by the installation host (e.g. Active Army NEC).

2.1.3.4. The voice and data services from the public service provider shall terminate in the EF and be extended from the EF to the Telecommunications Equipment Room (TER).

2.1.4. Telecommunications Equipment Room (TER).

2.1.4.1. Unless a joint use site, each Army Reserve site or campus shall have only one TER.

2.1.4.2. The TER is typically located in the main training building. However, the TER location can vary depending on the needs of the site or campus.

2.1.4.3. The maximum number of horizontal cabling terminations in a standard size TER (90 sq. ft.) is 144.

2.1.4.4. If joint use site, provide a TER for each Service (e.g. Army Reserve, Army National Guard, USMC, etc.) occupying the site. In lieu of a separate TER, lockable cabinets (keyed separately for each component) may be used in the TER.

2.1.5. Telecommunications Room (TR)

2.1.5.1. Additional TRs are required as needed to maintain compliance with Telecommunications Industry Association (TIA) standards. The maximum cable length from the TR patch panel through the structured cabling system to the furthest outlet cannot exceed 295 ft. (90 meters).

2.1.5.2. The maximum number of horizontal cabling terminations in a standard size TR (90 sq. ft.) is 144.

2.1.5.3. Provide a TR for each component (e.g., Army Reserve, Army National Guard, USMC, etc.) occupying a joint-use building. In lieu of a separate TR, lockable cabinets (keyed separately for each component) may be used in a TR.

2.2. Telecommunications Spaces Sizing

2.2.1. The minimum square footage requirements for telecommunications spaces as listed in United States Army Reserve (USAR) Design Guide USAR Facilities have been superseded by the following:

2.2.1.1. EF = 48 square feet (6’ x 8’)

2.2.1.2. TER = 90 square feet (9’ x 10’)

2.2.1.3. TR = 90 square feet (9’ x 10’)

2.2.1.4. Above sizes for the TER and TR are based on a maximum of 144 horizontal cabling terminations in the TER or TR. If the TER or TR will serve more than 144 horizontal cabling terminations, the minimum square footage requirements shall be 120 square feet (12’x10’).

2.3. General Requirements

2.3.1. Telecommunications spaces must be dedicated spaces not shared with other non-information communications technology functions (electrical rooms, mechanical rooms, plumbing).

2.3.2. All telecommunications spaces shall be rectangular in shape with no unusual offsets or curves.

2.3.3. Windows are not allowed on any wall or door of the EF, TER, or TR(s).

2.3.4. Accessibility must be provided for delivery of equipment such as network switches, equipment racks, and cabinets.

2.3.5. Location

2.3.5.1. When designing telecommunications spaces, avoid locations that are restricted by building components that may limit expansion such as elevators, outside walls, or other fixed building walls.

2.3.5.2. The EF, TER, or TRs shall not be located adjacent to an elevator machine room.

2.3.5.3. The EF, TER, or TR shall not share a wall with any wall that has plumbing located in it (e.g., restrooms, janitor's closet).

2.3.5.4. Locations of telecommunications spaces must be evaluated for risk to critical infrastructure (water, dust, electromagnetic impulse (EMI) influence). Locate the telecommunications space away from sources of electromagnetic interference or design the space to mitigate the effects of this interference. Give special attention to electrical power supply transformers, motors and generators, X-ray equipment, and radio or radar transmitters.

2.3.5.5. Locate the TER and TR(s) in an accessible area of the building (e.g., common hallway).

2.3.5.6. Locate the TER and all TRs central to the areas they serve and in such a manner that the maximum cable length from the patch panel through the structured cabling system to the furthest outlet does not exceed 295 feet (90 meters).

2.3.5.7. For multi-story buildings, it is strongly preferred that the TRs are stacked.

2.3.5.8. Locate the EF on an exterior wall.

2.3.6. There shall not be any piping, ductwork, machinery, or equipment that does not serve the EF, TER, or TR installed above or in the EF, TER, or TR nor will this equipment pass-through or enter the EF, TER, or TR(s).

2.3.7. Utility piping needed to serve telecommunications spaces should not be routed over communications racks or cabinets or electrical panels. Where routing over such areas cannot be avoided, provide all wet and drainage piping with special protection, such as double wall containment piping or drip pans with leak detection to protect the space below from leakage and/or condensation.

2.3.8. The head-end equipment and cabling for electronic safety and security (ESS) systems is allowed to be in the EF, TER, or TR(s). This equipment shall be in a wall mount panel or be rack-mount capable. If rack-mounted, it shall be mounted in rack 2. The workstation(s) for these systems shall not be in the TER or TR.

2.3.9. CATV cabling shall be terminated in the EF. CATV head-end equipment shall be in the EF. In the case where the Army Reserve facility does not have an EF, the CATV cabling can be terminated in the TER or TR and the CATV head-end equipment can be in the TER or TR.

2.3.10. Hard (gypsum board) ceilings are allowed in the EF, TER, or TR only when an open to the deck ceiling is not practical due to the height of the deck above (i.e., TRs in open maintenance bay areas). Minimum hard ceiling height is 12 feet above finished floor (AFF).

2.3.11. In addition to the requirements listed in UFC 3-580-01 for plywood backboard, the following requirements shall apply. The "A" side of the plywood backboard shall contain the fire-rated stamp and shall face out into the room. Each sheet of plywood shall be finished with two coats of fire-

retardant paint. Paint color shall match the interior wall color of the room. Plywood shall be painted prior to installation of any equipment. Leave one fire-rated stamp unpainted on each sheet of plywood.

2.4. Racks and Cabinets

2.4.1. Racks

2.4.1.1. A minimum of 36 inches of clearance is required from the front of each rack.

2.4.1.2. A minimum of 42 inches of clearance is required from the rear of each rack.

2.4.1.3. A minimum of 36 inches of side clearance is required on at least end of the rack or row of adjacent racks.

2.4.1.4. Provide two post, heavy-duty racks in quantities sufficient to accommodate the cabling systems and equipment for the project. At a minimum, provide the quantities as shown in Appendix C. Racks shall be.

2.4.1.4.1. EIA-310-D compliant.

2.4.1.4.2. Support 19-inch-wide EIA rack mount equipment.

2.4.1.4.3. Equipment static load capacity of 1000 lbs.

2.4.1.4.4. 45 U (7 feet) height.

2.4.1.4.5. EIA-310 D compliant universal hole pattern.

2.4.1.4.6. 5/8”-5/8”-1/2” vertical hole spacing.

2.4.1.4.7. Threaded #12-24 equipment mounting holes with included equipment-mounting screws.

2.4.1.4.8. Fixed in place.

2.4.1.4.9. Pre-marked and numbered rack-mount spaces.

2.4.1.4.10. Have an integrated grounding/bonding lug with a built-in attachment point for a bonding connection.

2.4.1.5. If floor mounted lockable telecommunications cabinets are used in place of telecommunications racks, they shall meet the minimum specifications for telecommunications racks and are to be 36” in depth and have adequate internal ventilation (louvers and fan kit). Fan kit shall be mounted to the interior, top of the cabinet. Multiple telecommunications cabinets used on the same site must all be keyed alike. If used to support separation of cabling for multiple components (i.e. AR, ARNG), the cabinets for each component must be keyed alike but shall be different from the keyset for the other component(s).

2.4.1.6. The use of a telecommunications enclosure (TE) with telecommunications cabinet will only be allowed with USARC CIO/G-6 NEC approval.

2.4.1.6.1. For 48 or fewer terminations, the Hubbell RE4X (or approved equivalent) cabinet shall be used. Cabinet shall include:

2.4.1.6.1.1. 42-inch cabinet height.

2.4.1.6.1.2. Fan kit.

2.4.1.6.1.3. Sound dampening kit.

2.4.1.6.1.4. Padlock hasp kit.

2.4.1.6.1.5. Padlock.

2.4.1.6.1.6. Patch panel mounting bracket.

2.4.1.6.1.7. 20A power kit.

2.4.1.6.1.8. Equipment mounting bracket.

2.5. Mechanical Systems

2.5.1. All IT spaces are considered class B for HVAC. Class B spaces include only temperature control. Design the EF, TER, and all TRs to meet the HVAC requirements of TIA-569, including the Class B requirements for temperature as outlined in ASHRAE Thermal Guidelines for Data Processing Environments 4th Edition. Specific humidification and/or de-humidification is not required. Provide each space with its own independent thermostat for climate control. Provide each space with positive atmospheric pressure to minimize dust. Back-up systems are not required, but if an emergency power source is available in the facility, connect the mechanical system that serves each telecommunications space to the emergency power source.

2.6. Electrical Systems

2.6.1. The electrical panel that serves the EF, TER, and each TR must be in and dedicated to the space it serves. This panel must meet the following minimum requirements.

2.6.1.1. 120/208 volt, 3-phase or 120/240 volt, 1-phase, 24-(or 20 for 1-phase) space panel with a minimum 100 ampere (A) bus rated capacity.

2.6.1.2. Feed all loads within the EF, TER, or TR(s), except lighting, from this dedicated panel. Loads must include, but are not limited to, convenience receptacles, dedicated rack or cabinet receptacles, and mechanical systems.

2.6.1.3. No other loads shall be fed from this panel.

2.6.1.4. Provide and install one (1) dedicated 120V/20 circuit with one (1) double duplex NEMA 5-20 receptacle for each telecommunications rack or cabinet in the TER and each TR.

2.6.1.4.1. Mount the receptacle at 6 inches AFF within the telecommunications rack rear vertical wire manager.

2.6.1.4.2. Mount the receptacle inside the floor mounted telecommunications cabinet in the within the right, rear rack channel at 12 inches AFF.

2.6.1.5. In the EF, provide and install one (1) dedicated 120V/20A circuit with one (1) double duplex NEMA 5-20 receptacle.

2.6.1.5.1. Mount this receptacle at 18 inches AFF on the plywood backboard on the lower left corner of the area indicated in the design as “Reserved for Service Provider Equipment.”

2.6.1.6. If provided specific power requirements by the local service provider, provide, and install electrical receptacles that meet these requirements. Each of these receptacles shall be on a dedicated circuit.

2.6.1.6.1. Mount these receptacles at 18 inches AFF on the plywood backboard on the lower left corner of the area indicated in the design as “Reserved for Service Provider Equipment.”

2.6.1.7. In the EF, TER, and each TR, provide 125V, 20A duplex convenience receptacles at 6 feet intervals around the perimeter of the room.

3. Outside Plant (OSP) Pathways and Cabling

3.1. General Information and Requirements

3.1.1. On a site where the Army Reserve is a tenant unit, the Designer of Record (DOR) shall coordinate the OSP pathways and cabling requirements with the owning installation telecommunications infrastructure representative. For all other sites, the following criterion shall be followed.

3.1.2. Provide a system that provides a flexible, re-usable, expandable pathway for OSP distribution of telecommunication services throughout the site.

3.1.3. All OSP shall be installed in accordance with (IAW) this criterion and UFC 3-580-01.

3.1.4. All OSP pathways shall be underground. This includes the pathways from the EF to the SPPOC located at the property line or adjacent street. Aerial pathways will only be considered where the use of underground pathways is not a viable option. The use of aerial pathways must be explicitly approved by USARC CIO/G-6 NEC prior to design and/or implementation.

3.1.5. The service provider is the local telephone company (a.k.a. Local Exchange Carrier (LEC)). The SPPOC is the point (e.g., telephone pole, maintenance hole, hand hole, pedestal) located at the property line or adjacent street where the service provider cabling enters Army Reserve property. The DOR shall coordinate with the service provider during the design process to determine the type and location of the SPPOC and to determine the service providers requirements for connecting the pathways from the EF to the SPPOC.

3.2. Pathways

3.2.1. Provide two 4-inch conduits from the EF to the SPPOC. Innerduct is not required in these two conduits.

3.2.2. For all buildings where ARNET and voice services are needed, provide two 4-inch conduits from the TER to other buildings TR or Telecommunications Enclosure (TE).

3.2.3. Provide one 3 inch-3 cell fabric mesh inner-ducts with integrated tracer wire in each conduit. Extend inner-duct 6 inches beyond the end of the conduit in each telecommunications space.

3.2.4. PVC coated RGS/RSC conduit is required for all building exterior and building interior conduit entry sweeps.

3.2.5. Above ground building cable entrance points shall use l-shaped rigid conduit bodies (e.g., LL, LB, and LR) for building entry. The above ground conduit shall be rigid metal conduit (RMC). Once inside the building, the conduits shall be extended to the appropriate EF, TER, TR, or TE using intermediate metal conduit (IMC) or RMC.

3.2.6. The 50-year frost line data must be used to determine the underground pathway depth requirements with a minimum depth of 24 inches below grade to the top of the conduit structure. The top of the underground pathway must be buried below the frost line. In areas where frost lines exist at excessive depths, coordinate with the authority having jurisdiction (AHJ) to determine the minimum depth requirements to support local frost line requirements.

3.2.7. Spacers are required for all conduit formations (both encased and non-encased) to properly support the conduits and maintain their integrity of orientation and must be

installed in accordance with the manufacturer's specifications. Plastic spacers must provide a minimum of 2 inches (50 millimeters) of spacing between conduits. Conduits and spacers must be securely banded together. Spacers must be installed at a minimum of one spacer every 5 feet (1.5 meters). The use of bricks or wood as spacers is not permitted. However, use of concrete cinder blocks as spacers (and tie-downs) is an acceptable alternative with the approval of the AHJ.

3.2.8. Maintenance Hole

3.2.8.1. The maximum distance allowed between maintenance holes is 1000 feet.

3.2.8.2. The use of medium-sized (approximately 8 feet by 6 feet by 7 feet (2.4 meters by 1.8 meters by 2 meters) maintenance holes (MH) are allowed.

3.2.8.3. All MH structures shall be precast reinforced concrete. Suppliers of precast MH structures must have a National Precast Concrete Association (NPCA) certified manufacturing facility that implements and maintains a NPCA certified quality control program.

3.2.8.4. Splayed MHs are the preferred type when a precast MH structure is used.

3.2.8.5. MHs must use multiple plastic duct terminators to accept the conduits. A minimum of 6 terminators on each MH wall is required. The use of thin-walled knockouts is not allowed.

3.2.8.6. MH covers must be H-20 rated for continuous heavy vehicle traffic.

3.2.8.7. MHs must have an integrated ground system. This system must be clearly identified by the manufacturer either on drawings or inside the MH. A separate bonding ribbon (halo) is not required in MHs equipped with an integrated ground system.

3.2.9. Hand Hole

3.2.9.1. The use of hand holes (HH) is allowed only as the last structure before an end user building (buildings without a TER) and where there is no possibility that the conduit system will be extended and where required by the local service provider telephone company as their point of connection. Splice points are not allowed in a HH.

3.2.9.2. The minimum acceptable pull-point HH size is 4 feet by 4 feet by 4 feet (1.2 meters by 1.2 meters by 1.2 meters).

3.2.9.3. HHs must have an integrated ground system. This system must be clearly identified by the manufacturer either on drawings or inside the HH. A separate bonding ribbon (halo) is not required in HHs equipped with an integrated ground system.

3.2.10. Accessories

3.2.10.1. Provide all MH and HH accessories as required by UFC 3-580-01.

3.2.10.2. All attachment hardware shall be stainless steel.

3.2.10.3. A 12-inch sump is allowed in all MH and HH.

3.2.11. Duct Cleaning

3.2.11.1. All ducts will be cleaned using high pressure jetting, wire brushes, rubber conduit swabs, and leather washer conduit cleaners to remove all debris.

3.2.11.2. Ducts shall be sealed and/or plugged immediately after the cleaning is complete.

3.3. Backbone Cabling

3.3.1. Unless explicitly approved by USARC CIO/G-6 NEC, all fiber and copper backbone cable shall be homerun with no breaks or splices.

3.3.2. Fiber Cabling

3.3.2.1. All backbone fiber optic cabling shall be single-mode (SM) optical single-mode (OS)2 rated as defined in TIA 492CAAB.

3.3.2.2. All backbone fiber optic cabling shall be terminated using Ultra-Physical Contact (UPC) duplex Lucent Connector (LC) style connectors.

3.3.2.3. A minimum of 24 strands of SM fiber backbone cabling is required from the TER to all other buildings TR or TE.

3.3.3. Multi-pair Backbone Copper Cabling

3.3.3.1. All backbone copper cabling shall be category 3 rated.

3.3.3.2. A minimum of 25 pair copper backbone cabling is required from the TER to all other buildings TR or TE.

3.3.3.3. All backbone copper cabling shall be terminated onto a wall-mounted 110 style IDC terminations protected entrance terminal (PET) and then extended to a voice-grade patch panel rack-mounted patch panel. See Appendix C for further details.

3.3.4. A minimum of 50 feet of slack fiber optic cable in required in each MH or HH not containing a splice.

3.3.5. A minimum of 75 feet of slack fiber optic cable in required in each MH or HH on each side (in and out) of a splice case.

3.3.6. A minimum of 50 feet of slack cable is required in the TER, TR(s), and TE(s) for both SM fiber backbone cabling and copper backbone cabling. Loosely coil all slack cable but do not exceed bend radius as specified in TIA-569.

4. Inside Plant (ISP) Pathways and Cabling

4.1. General Requirements

4.1.1. Cabling is not allowed to be exposed in any open ceiling area (e.g., work bays, unit storage areas, warehouse areas, hangars). All cabling installed in these areas must be in conduit.

4.1.2. It is highly desirable that backbone or horizontal cabling is not routed through mechanical or electrical rooms or above hard ceiling areas. If there are no other options to route this cabling, then all cabling in these areas must be in conduit.

4.2. Pathways

4.2.1. Provide a minimum of two 3-inch conduits from the EF to the TER. If the cable tray system extends to the corridor immediately outside the EF, then this conduit may be omitted and backbone cable routed through the cable tray.

4.2.2. For stacked TRs in multi-story buildings, provide a minimum of two 4-inch floor sleeves from the TR above to the TER/TR ceiling below. These sleeves shall be self-sealing, re-enterable, mechanical fire-stop assemblies.

4.2.3. For non-stacked TRs in multi-story buildings, provide a minimum of two 3-inch conduits from the TER to the TR(s) on other floors.

4.2.4. Floor and Wall Penetrations

4.2.4.1. The initial fill capacity of each floor or wall sleeve shall be 80 percent or less. One spare, empty sleeve of the same size and type shall also be provided.

4.2.4.2. Provide radius drop-out (waterfall) supports for all sleeves/conduits for any rise greater than 2 feet from the exit point of the sleeve/conduit to the cable support below.

4.2.4.3. If the distance from the exit point of the conduit/sleeve to the cable support below exceeds 5 feet, then the cable must be supported from the exit point of the conduit/sleeve to the cable support below.

4.2.4.4. All wall penetrations in fire-rated walls require the use of self-sealing, re-enterable, mechanical fire-stop assemblies.

4.2.4.4.1. If unable to determine fire-rating of the wall, then the use of self-sealing, re-enterable, mechanical fire-stop assemblies is required.

4.2.4.5. All multi-story floor sleeves shall be self-sealing, re- enterable, mechanical fire-stop assemblies.

4.2.4.6. All conduits with cabling installed requiring additional fire-stopping shall be fire-stopped with an appropriate fire-stopping putty.

4.2.4.7. Removable, re-useable fire stopping plugs shall be used on all empty 2- and 4-inch conduits requiring additional fire-stopping.

4.2.5. Horizontal Cabling Conduit

4.2.5.1. All conduits must be sized for an initial fill ratio of 40% or less. This 40% fill ratio must be based on a horizontal cabling outside diameter of .30 inches. The minimum size conduit is one inch.

4.2.5.2. In all new construction projects, conduit shall extend from the outlet box to the nearest cable tray, TER, or TR. The use of non-continuous cable support is not allowed in new construction projects.

4.2.5.3. Up to three outlet boxes can be daisy-chained together.

4.2.5.4. Each floor box shall have two conduits (one in use and one spare). Up to two floor boxes can be daisy-chained together. The conduit supporting floor boxes shall be installed in a homerun fashion and terminated directly in the TER or TR supporting the floor box location.

4.2.5.5. Modular furniture system connections (up to 8 Category 6a cables) require a 1.5-inch liquid-tight flexible metal conduit and fittings to connect each floor box or wall box to the acoustic panel raceway.

4.2.6. Cabling Support

4.2.6.1. Cable Tray

4.2.6.1.1. Basket style cable tray is used for pathways and horizontal distribution outside of the telecommunications spaces. Basket style cable tray cannot enter the EF, TER, or any TR.

4.2.6.1.2. Cable tray shall support a minimum of 90% of the premise cabling.

4.2.6.1.3. Cable tray shall be sized so the sum of the cross-sectional areas of the low-voltage cabling will not exceed 25 percent of the interior cross-section of the cable tray.

4.2.6.1.4. The cable tray system shall originate in the corridor immediately outside of the EF, TER, or TR. The distance from the cable tray to the TER or TR adjacent or perpendicular wall shall not exceed 10 inches.

4.2.6.1.5. In all TE locations with drop ceilings, cable tray shall be installed above the drop ceiling to support the horizontal and backbone cabling. Sleeves shall be installed through the drop ceiling for routing cabling to the cabinet and/or plywood backboard.

4.2.6.1.6. Distance from conduit stub out to cable tray shall not exceed 40 feet.

4.2.6.1.7. Cable tray is not allowed above hard ceiling areas. All cabling routed through hard ceilings must be routed in conduit sized IAW this criterion.

4.2.6.1.8. Cable tray is not allowed in any below finished ceiling area, work bays, maintenance bays, unit storage areas, warehouse areas, or hangar areas.

4.2.6.1.9. The minimum size cable tray allowed is 6 inches wide x 4 inches deep.

4.2.6.1.10. Provide 12-inch minimum clearance above the top of the cable tray and 3-inch minimum clearance below the lowest point of the cable tray support (e.g., threaded rod). If angled wall support brackets are used, then provide 3-inch minimum clearance below the lowest point of the angle bracket.

4.2.6.1.11. If center-hung supports are used, the threaded rod must be padded to prevent accidental damage to the cable jacket.

4.2.6.2. Non-Continuous Cable Support

4.2.6.2.1. The use of non-continuous cable support is not allowed in new construction projects. Non-continuous cable support can only be considered for use in modernization and/or renovation projects.

4.2.6.2.2. J-hooks are the only approved non-continuous cable support method. They shall not replace cable tray but can be used to provide cable support where the use of cable tray is not feasible.

4.2.6.2.3. J-hooks shall be Category 6a rated and spaced at intervals that shall not exceed 60 inches from the conduit stub up or ceiling entry point to the cable tray.

4.2.6.2.4. Each J-hook shall not exceed 50 percent of the J-hook fill capacity.

4.2.6.2.5. J-hooks are not allowed in any below finished ceiling area, work bays, maintenance bays, unit storage areas, or warehouse areas.

4.2.6.3. Ladder Style Cable Tray (a.k.a. Ladder Rack)

4.2.6.3.1. Ladder rack is the only approved cabling support method allowed in the EF, TER, and all TRs. Both horizontal and vertical style ladder rack shall be used. Basket style cable tray shall not enter or pass through the EF, TER, or any TR.

4.2.6.3.2. Ladder rack shall be 1-1/2-inch x 3/8-inch stringers with 1/2-inch x 1-inch welded rungs at 12-inch intervals.

4.2.6.3.3. The minimum width for all horizontal ladder rack is 18 inches.

4.2.6.3.4. The minimum width for all vertical ladder rack is 12 inches.

4.2.6.3.5. Ladder rack shall be secured to the wall and/or ceiling deck above. Use only wall mount or trapeze mounting systems.

4.2.6.3.6. Ladder rack above equipment racks shall be fastened to these racks with 6-inch elevation kits and rack to runway mounting kits.

4.2.6.3.7. Radius dropouts (waterfalls) shall be used in all locations where the premise cabling is routed to the equipment rack below. All radius dropouts for the telecommunications racks shall be attached to the ladder rack and shall be the same width as the ladder rack used.

4.2.6.4. Provide vertical cable managers on both sides of all equipment racks. Vertical cable managers shall be.

4.2.6.4.1. Minimum 6 inches wide.

4.2.6.4.2. Double sided.

4.2.6.4.3. Double hinged.

4.2.6.4.4. Match the height of the rack.

4.2.6.4.5. Bolted to telecommunications racks (to both racks if placed in between two racks).

4.2.6.5. All horizontal cabling shall be secured to the patch panel strain relief bars using ¾ inch wide Velcro fasteners. The use of plastic tie-wraps on horizontal cabling is NOT allowed.

4.3. Backbone Cabling

4.3.1. Unless explicitly approved by USARC CIO/G-6 NEC, all fiber and copper backbone cable shall be homerun with no breaks or splices.

4.3.2. Fiber Cabling

4.3.2.1. All backbone fiber optic cabling shall be single-mode (SM) OS2 rated as defined in TIA 492CAAB.

4.3.2.2. All backbone fiber optic cabling shall be terminated using Ultra-Physical Contact (UPC) duplex LC style connectors.

4.3.2.3. A minimum of 24 strands of SM fiber backbone cabling is required from the TER to the EF, and to each TR and TE in the building.

4.3.3. Multi-pair Backbone Copper Cabling
4.3.3.1. All backbone copper cabling shall be category 3 rated.
4.3.3.2. A minimum of 25 pair copper backbone cabling is required from the TER to the EF, and to each TR and TE in the building.
4.3.3.3. All backbone copper cabling shall be terminated onto a wall-mounted 110 style IDC termination block and then extended to a voice-grade patch panel rack-mounted patch panel. See Appendix C for further details.
4.3.4. A minimum of 20 feet of slack cable is required in the EF, TER, TR(s), and TE(s) for both SM fiber backbone cabling and copper backbone cabling. Loosely coil all slack cable but do not exceed bend radius as specified in TIA-569.

4.4. Horizontal Cabling

4.4.1. Provide and install all cables/outlets as listed in this section and in Appendix A of this criterion.
4.4.2. Avoid placing outlet behind/under furniture wherever possible. In the event this is not possible, the telecom DOR/contractor shall coordinate with the furniture DOR/contractor to ensure that outlets that must be placed behind/under furniture will be readily accessible after the furniture is installed.
4.4.3. All horizontal cabling shall be category 6a rated with an outside diameter no greater than .30 inches.
4.4.4. The use of multi-user telecommunications outlet assembly (MUTOA) or consolidation points is not allowed. All horizontal cabling must be installed in a homerun fashion from the jack to the appropriate TER, TR, or TE.
4.4.5. In non-fire rated walls, the use of low-voltage mounting brackets (e.g., mud ring, plaster ring, square-drawn cover, box eliminator) is an approved alternative to the use of standard outlet boxes with stub-up conduit (non-fire rated walls only). A protective, plastic insert in the top stud is required to be installed prior to routing the cable(s) down to the low voltage mounting bracket.
4.4.6. All cabling installed in conduit in or below a concrete slab that is in direct contact with the earth must be rated for use in wet locations.
4.4.7. Cable Jacket and Jack Colors
4.4.7.1. The standard cable jacket color and jack color shall be blue.
4.4.7.2. The cable jacket color and jack color for all IDS panel cabling shall be purple.
4.4.7.3. If the facility is joint-use, the cable jacket and jack color(s) will be determined by USARC G-6 during the design process.
4.4.8. Wireless Access Point Outlets
4.4.8.1. Facilities without an ARNet requirement (i.e. Unheated Storage) are excluded from this requirement.
4.4.8.2. Provide two category 6A jacks per WAP outlet.
4.4.8.3. Except for the below listed areas, provide one Wireless Access Point (WAP) outlet (1 jack) for each 60 by 60-foot square grid of each building. Locate this outlet on the wall as close as practical to the center of each grid. Note that WAP outlets cannot be located within 10 feet of any area designated for secure communications.

4.4.8.3.1. The following areas are excluded from the 60 by 60-foot square grid requirement. Refer to Appendix C of this criterion for WAP outlet requirements in these spaces.
4.4.8.3.1.1. Unit storage.
4.4.8.3.1.2. Work bays.
4.4.8.3.1.3. Maintenance bays.
4.4.8.3.1.4. Open warehouse areas.
4.4.8.3.1.5. Hangar areas.
4.4.8.4. Locate all WAP outlets in an area free from obstructions above, below, or immediately in front of the outlet.
4.4.8.5. Add one WAP outlet as close as practical to the main entrance of each building.
4.4.8.6. WAP Outlet Mounting
4.4.8.6.1. For all standard height (9 ft. or lower) accessible (i.e. drop) ceiling locations, mount the outlet 18 inches above finished ceiling. Provide a minimum of 6 inches of clearance on all sides of the outlet box.
4.4.8.6.2. For all standard height (9 ft. or lower) non-accessible (i.e. hard) ceiling locations and high height (9 ft. 1 inch or higher) accessible ceiling locations (e.g. assembly hall), mount the outlet 8 feet AFF. Provide a minimum of 24 inches of clearance on all sides of the outlet box.
4.4.8.6.3. For all work bays and maintenance bays, mount the outlet at 12 feet AFF. Provide a minimum of 24 inches of clearance on all sides of the outlet box.
4.4.8.6.4. Refer to Appendix C for WAP outlet mounting requirements in open warehouse and hangar areas. Mounting height in these areas will be dependent on open ceiling height. Coordinate with USARC CIO/G-6 NEC for mounting height in these areas.
4.4.9. All horizontal cabling shall be terminated using T568B pin-out configuration.
4.4.10. Except for the IDS cabling (see section 4.6), terminate all horizontal cabling in sequential fashion on the patch panel(s). Do not separate horizontal cabling by outlet type (e.g., data outlet, WAP outlet, wall phone outlet) onto separate patch panels.
4.4.11. The use of service loops is not allowed at any time. Store horizontal cabling slack in its natural lay or in a tear drop fashion in the cable tray or on the ladder rack.
4.4.12. Metallic separation is required between horizontal cabling and power wiring in systems furniture track and/or power poles IAW UFC 3-580-01, TIA-569, and NFPA 70.
4.4.13. Cable Bundling
4.4.13.1. Cables laid into wire basket or other non-solid tray system shall not be bundled but shall be installed in their natural lay.
4.4.13.2. Each 48-port patch panel shall have a bundle of no more than 24 cables from the left side and 24 cables from right side.

4.5. Intrusion Detection System (IDS)

4.5.1. For each IDS control panel, provide and install two Category 6a cables from the IDS panel to the appropriate TER/TR. Install both cables in a single 1-inch EMT conduit.
4.5.2. Cable jacket and jack color shall be purple.

4.5.3. In the TER/TR, terminate the cables on the last 2 ports of the last category 6a patch panel in the rack.

4.5.4. For each IDS panel cable, add the label “IDS” to the front of the patch panel port and to the horizontal cable at the rear of the patch panel.

4.5.5. In the IDS Panel, terminate each cable with an RJ-45 8P8C jack. Provide 24 inches of slack cable in the IDS panel.

5. Grounding/Bonding

5.1. General Requirements

5.1.1. The design and installation of the telecommunications grounding/bonding system and its components shall meet or exceed all requirements of this criterion, TIA-607, and NFPA 70.

5.1.2. Primary Busbar (PBB) and Secondary Busbar (SBB) Requirements

5.1.2.1. Length, width, and hole configuration as shown in Appendix C of this criterion.

5.1.2.2. Mounting height of 6 feet 6 inches AFF.

5.1.2.3. Listed insulators and mounting brackets.

5.1.2.4. Minimum of 50.8 mm separation distance from the wall.

5.1.2.5. Copper or a copper alloy with a minimum of 95% conductivity.

5.1.2.6. Electrotin-Plated (ETP).

5.1.3. Rack Mounted Busbar (RBB) Requirements

5.1.3.1. Length, width, and hole configuration as shown in Appendix C of this criterion.

5.1.3.2. 1 per telecommunications rack.

5.1.3.3. Locate at the top rear of the rack.

5.1.3.4. Copper or a copper alloy with a minimum of 95% conductivity.

5.1.3.5. Electrotin-Plated (ETP).

5.1.3.6. Each telecommunications rack and/or cabinet shall be bonded via the integrated bonding lug to its RBB with a minimum #6 American Wire Gauge (AWG) size bonding conductor. This bonding connection shall not impede the installation of other rack- mounted equipment.

5.1.4. Bonding Lugs

5.1.4.1. All bonding lugs shall be 2-hole, long barrel type lugs with a minimum of two crimp points to the bonding conductor.

5.1.4.2. All bonding lugs shall have inspection windows so that bonding connections may be inspected for full conductor insertion.

5.1.5. Bonding Conductors

5.1.5.1. Size IAW TIA-607 up to a maximum size of 3/0 AWG.

5.1.5.2. Size the telecommunications bonding conductor (TBC) IAW the TIA-607 requirements for a telecommunications bonding backbone (TBB).

5.1.6. Bonding Connections

5.1.6.1. All bonding connections shall be to the front of the PBB and SBB.

5.1.6.2. Bonding connections cannot share the same holes on any PBB, SBB, or RBB.

5.1.6.3. Bonding connections to the busbar shall utilize listed compression two-hole lugs.

5.1.6.4. Bonding connections to metallic telecommunications infrastructure (e.g., racks, ladder rack, cable tray) shall utilize listed compression two-hole lugs wherever possible or equivalent one-hole non- twisting lugs, or other irreversible compression type connections where the use of two-hole lugs is not possible (e.g., conduit bonding bushings).

5.1.6.5. The use of self-tapping screws is not allowed for any bonding conductor connection.

5.1.6.6. Prior to installing any bonding conductors an antioxidant compound shall be applied to all bonding surfaces that are not electrotin-plated.

5.1.6.7. Prior to making any bonding connection, paint shall be fully scraped from any painted surface such that the scraped surface is fully visible after making the bonding connection.

6. Labeling

6.1. General Requirements

6.1.1. All labeling shall be IAW the requirements as listed in American National Standards Institute (ANSI)/TIA 606 (Class 3 requirements) and the requirements in Appendix C of this criterion.

6.1.2. Handwritten labels are not acceptable.

6.1.3. All conduit labels must be self-laminating cable tags that are properly secured to the conduit.

6.1.4. Self- laminating cable tags shall be installed on all backbone cabling as close as practical to the termination point (e.g., Fiber Optic Patch Panel (FOPP) or PET), maintenance hole conduit, or hand hole conduit of the cabling.

6.1.5. If the facility is joint use, each outlet shall be labeled with the branch of service as well (e.g., R for Army Reserve, G for Army National Guard). Additional labeling details will be determined by USARC CIO/G-6 NEC during the design process.

6.1.6. Stencil new MHs and HHs inside the structure with an identifier designated by the AHJ. Place the stencil near the top of the MH or HH so that it is visible when the cover is open. In addition, conduit windows in both new and reutilized MHs and HHs must be stenciled (if not already) to denote where conduits are connected.

7. Testing

7.1. General Requirements

7.1.1. All testing shall be performed IAW the requirements as listed in UFC 3-580-01, ANSI/TIA-568, ANSI/TIA 455, ANSI/TIA 1152, ANSI/TIA 607, and this criterion.

7.1.2. All testing devices used must have been calibrated/recertified within one year of performing field testing. Proof of calibration/recertification is to be provided with the test reports.

7.1.3. All cables must be permanently installed in their final locations prior to conducting final acceptance testing.

7.1.4. Prior to conducting any testing, a visual inspection of all horizontal cabling, multi-pair copper cabling, single mode fiber cabling, and all grounding/bonding components (i.e., busbars, bonding conductors, bonding lugs) shall be conducted. This visual inspection shall include:

7.1.4.1. Cabling and components will be inspected for any rips, tears, stretch marks, irregular bends, and other deformities.

7.1.4.2. Proper labeling of all cabling and components.

7.1.4.3. Proper cable placement, bend radii, terminations, bonding connections, and cable slack (where required).

7.1.5. Failed and/or marginal test reports will not be accepted. Any cabling or component that fails any test or has a marginal test result shall have the issue(s) corrected and the testing re-done until a passing test result is obtained prior to submitting any test reports.

7.2. Final Acceptance Testing

7.2.1. Test Plan

7.2.1.1. At least 60 days prior to conducting final acceptance testing, the contractor shall submit a test plan to USARC G-6. This test plan shall indicate all test equipment, testing methodology, and plan of delivery of test results to USARC G-6. This test plan must be approved by USARC G-6 prior to conducting final acceptance testing. The test plan shall be in the format as shown in Appendix B.

7.2.1.2. The test plan shall be reviewed and approved by an active BICSI RCDD. The test plan shall be stamped by the RCDD indicating their review and approval. This stamp shall be on the title page of the test plan.

7.2.2. Testing Requirements

7.2.2.1. Horizontal Cabling

7.2.2.1.1. Perform final acceptance testing IAW TIA-568 requirements.

7.2.2.2. Backbone Fiber

7.2.2.2.1. Perform final acceptance testing IAW the UFC 3-580-01 Chapter 3 requirements to include both tier 1 and tier 2 testing.

7.2.2.3. Multi-Pair Copper Cabling

7.2.2.3.1. Perform final acceptance testing IAW TIA-568 requirements.

7.2.2.4. Telecommunications Bonding System

7.2.2.4.1. Perform final acceptance testing IAW TIA-607 requirements using the two-point ground/continuity testing method.

7.2.2.4.2. The maximum value for resistance between any point in the telecommunications bonding system and the building's electrical grounding electrode system is 100 milliohms.

7.2.2.5. Maintenance Hole/Hand Hole Bonding System

7.2.2.5.1. Perform final acceptance testing IAW ANSI/TIA 607 requirements using the three-pole fall of potential testing method.

7.2.2.5.2. The maximum value for resistance is 25 ohms.

7.2.2.6. Splice Case(s)

7.2.2.6.1. Perform final acceptance testing tested IAW the manufacturer's instructions for flash testing.

7.2.2.6.2. Each splice case installed in an underground vault or maintenance hole must be flash tested.

7.2.2.6.3. Each test must be witnessed and verified by the U.S. Government (USG) approving authority.

7.2.3. Test Reports Delivery

7.2.3.1. The test reports for each project or construction specification section must be delivered as one consolidated document in Adobe PDF format.

7.2.3.2. The test reports shall be reviewed and approved by an active BICSI RCDD. The test reports shall be stamped by the RCDD indicating their review and approval. This stamp shall be on the title page of the test plan.

7.2.3.3. The test reports shall include the following items:

7.2.3.3.1. Title Page.

7.2.3.3.2. Table of Contents. The Table of Contents must indicate the page number(s) for each chapter and should be indexed for ease of use.

7.2.3.3.3. Each building shall have a separate chapter (with header page).

7.2.3.3.4. As-built floor plans indicating the location and jack label(s) for each telecommunications outlet installed. Jack labels must be in computer generated format. Hand-written floor plans are not acceptable. Each jack label on the as-built floor plans must match the actual label(s) that is on each telecommunications outlet.

7.2.3.3.5. Horizontal cabling test reports for each cable terminated in the TER, TR(s), and TE(s).

7.2.3.3.5.1. Both the summary and detailed test reports shall be included.

7.2.3.3.5.2. The cable label for each horizontal cable in the test report must match the cable label on the as-built floor plans.

7.2.3.3.6. Backbone fiber test reports for each strand terminated in the EF, TER, TR(s) and TE(s).

7.2.3.3.6.1. Both the summary and detailed test reports shall be included for tier 1 and tier 2 tests.

7.2.3.3.7. Mult-pair copper backbone cabling test reports for each pair terminated in the EF, TER, TR(s) and TE(s).

7.2.3.3.7.1. Both the summary and detailed test reports shall be included.

7.2.3.3.8. Provide telecommunications bonding system test reports in a tabular format.

7.2.3.3.9. Provide maintenance hole and/or hand hole bonding system test reports in a tabular format.

Appendix A Telecommunications Outlet Table

Space Name/Type/Function	Outlet Type	Jack Qty.	Outlet Qty.	Location/Notes
Entire Building/Space	WAP	2	Per Criterion	Provide WAP outlets for each building/space per section 4.4.8 and Appendix C of this criterion
Entire Building/Space	MFD	2	1	Provide 1 MFD outlet on wall immediately adjacent to each MFD location
Television	Standard	1	1	1 outlet for each television location. Locate immediately adjacent to CATV outlet
Administrative Offices (Full-Time and Exclusive)	Standard	1	2	1 outlet for workstation and 1 outlet on opposite or adjacent wall
Armorers Room	Standard	1	2	1 outlet for workstation and 1 outlet on opposite or adjacent wall
Arms Vault	IDS	2	N/A	Provide per section 4.6 of this criterion
Arms Vault	Wall Phone	1	1	Locate on interior wall opposite to arms vault door swing immediately adjacent to arms vault door opening
Assembly Hall	Standard	2	1	Locate on wall near instructor location
Battery Room	None Required	N/A	N/A	N/A
Break Area	None Required	N/A	N/A	N/A
Career Counselor Office (ARCC)	Standard	1	Varies	1 outlet for each workstation
Chair and Table Storage	None Required	N/A	N/A	N/A
Circulation	None Required	N/A	N/A	N/A
Classified Processing Team Room	Standard	2	3	Locate 1 outlet on each side wall and 1 outlet on rear wall
Commo/Elec. Shop	Standard	1	Varies	1 outlet for each workstation
COMSEC Storage	Standard	1	1	Locate immediately adjacent to planned location of IPS container
Conference Room	Standard	1	1	Locate on wall opposite entry door
Controlled Waste Storage	None Required	N/A	N/A	N/A
Custodial/Janitorial	None Required	N/A	N/A	N/A
Distance Learning Center	Standard	Varies	Varies	Coordinate jack and outlet locations and quantities with Distance Learning Manager. All student workstation and

				instructor jacks are to terminate in rack 2 of the nearest TR
Electrical	None Required	N/A	N/A	N/A
Elevator	Provide per UFC 3-490-06 Elevators			
Elevator Equipment Room	Provide per UFC 3-490-06 Elevators			
Entrance Facility	None Required	N/A	N/A	N/A
Facility Maintenance Storage	None Required	N/A	N/A	N/A
Family Support Office	Standard	1	2	1 outlet for workstation and 1 outlet on opposite or adjacent wall
Female Locker Room	Wall Phone	1	1	Locate just inside main entry door
Flammable Storage	None Required	N/A	N/A	N/A
Fluid Distribution Room	None Required	N/A	N/A	N/A
General Officer Suite	Standard	1	3	1 outlet for workstation, 1 outlet on opposite wall, and 1 outlet near table
IT Workspace	Standard	1	Based on full length of work surface	Continuous metal raceway extending the full length of the work surface with telecommunications outlets every 6 in (150 mm) on center
Kitchen Administrative Office	Standard	1	2	1 outlet for workstation and 1 outlet on opposite or adjacent wall
Lactation Room	None Required	N/A	N/A	N/A
Learning Center	Standard	1	1	Locate on wall opposite entry door
Lobby	Wall Phone	1	1	Locate just inside main door on side wall
Mail Distribution Room	None Required	N/A	N/A	N/A
Main Classroom	Standard	1	Varies	1 outlet per student location (Locate on wall if outlets can be located within 12 feet laterally of each row of student desks, otherwise provide floor boxes (combined with power) for each student seat)
Main Classroom	Standard	2	1	Locate on wall near instructor location
Male Locker Room	Wall Phone	1	1	Locate just inside main entry door
Male and Female Toilets	None Required	N/A	N/A	N/A
Male and Female Toilets/Showers	None Required	N/A	N/A	N/A
Mechanical Room	DDC	1	N/A	1 Cat6A cable from the DDC panel to the TER. Route cable in 1" EMT conduit from the DDC panel to the nearest cable tray or TER. Terminate

				on a Cat6A patch panel in the TER. Run Cat6A cable inside the panel to a location immediately below the Niagara/JACE device. Leave 18 inches of slack cable and terminate with an 8P8C RJ-45 connector
Mechanical Room	Standard	1	1	1 outlet. Locate immediately adjacent to the DDC panel
Physical Readiness Training	Wall Phone	1	1	Locate just inside main entry door
Retention Office	Standard	1	2	1 outlet for workstation and 1 outlet on opposite or adjacent wall
SCAA	Standard	1	Varies	Provide 6 outlets for a small or medium size facility and 12 outlets for a large or x-large facility
Secondary Classroom(s)	Standard	2	1	Locate on wall near instructor location
Shop Office	Standard	1	Varies	1 outlet per workstation
Simulator Room	Standard	2	1	Locate on wall behind desk
Special Equipment Alcove	None Required	N/A	N/A	N/A
Staging Area	None Required	N/A	N/A	N/A
Stairs	None Required	N/A	N/A	N/A
Storage Room	None Required	N/A	N/A	N/A
Supply Office	Standard	1	2	1 outlet for workstation and 1 outlet on opposite or adjacent wall
Team Room	Standard	1	1	Locate on wall opposite entry door
Telecommunications Equipment Room	None Required	N/A	N/A	N/A
Telecommunications Room	None Required	N/A	N/A	N/A
Tool and Parts Room	None Required	N/A	N/A	N/A
Unit Commons (Benching Table)	Standard	1	Varies	Locate on nearest wall to each benching table
Unit Commons (FTS Cubicle)	Standard	1	Varies	1 outlet per workstation. See Appendix C of this criterion for further details
Unit Storage	Wall Phone	1	1	Locate just inside main interior door to adjacent hallway
Vending Alcove	None Required	N/A	N/A	N/A
Work Bays	Wall Phone	1	1	Locate just inside main interior door to adjacent hallway

Appendix B Sample Test Plans

SPECIFICATION 27 10 00.00 48

Building Telecommunications Cabling System Final Acceptance Test Plan

Project: Anywhere, USA Army Reserve Center

Test Plan Rev. 0

Date: May 8, 2024

Prepared By: **The Best Low-Voltage Company, LLC**

Reviewed By: **Steve Smith, RCDD**

NOTE: THIS IS A SAMPLE TEST PLAN ONLY. IT IS NOT INTENDED TO BE REPRESENTATIVE OF THE TEST REQUIREMENTS FOR ALL PROJECTS. THE CONTRACTOR'S ACTUAL TEST PLAN MUST BE CUSTOMZED FOR THEIR PROJECT AND MUST INCLUDE THE TESTING REQUIREMENTS AS SPECIFIED IN THE CONTRACT SPECIFICATIONS OF THAT PROJECT.

Part 1 Testing Objectives

1. The objective of this test plan is to document the test instruments, testing methodology, and process for the delivery of the test reports. All testing equipment will be calibrated and recertified no more than one year prior to conducting any test. Certificates of calibration for each piece of test equipment listed in part 2 will be provided with the final acceptance test reports. This test plan has been developed IAW the contract specifications for this project.

Part 2 Test Instruments

Manufacturer	Model	Used to Test
		Horizontal Cabling
		Single-Mode Fiber (Optical Loss)
		Single-Mode Fiber (Optical Time Domain Reflectometer)
		Multi-Pair Copper
		Telecommunications Bonding System

Part 3 Testing Methodology

1. All testing will be conducted IAW the requirements listed in the ARNEC, UFC 3-580-01, and applicable TIA standards.
2. Visual Inspection.
    a. Prior to conducting any testing, all horizontal cabling, multi-pair copper cabling, single mode fiber cabling, and all grounding/bonding components (i.e., busbars, bonding conductors, bonding lugs) will be visually inspected. This visual inspection will include:
        i. Cabling and components will be inspected for any rips, tears, stretch marks, irregular bends, and other deformities.
        ii. Proper labeling of all cabling and components.
        iii. Proper cable placement, terminations, bonding connections, and required cable slack.
3. Failed Test Reports
    a. Failed test reports will not be submitted. Any cabling or component that fails any test will have the issue(s) corrected and the testing re-done until a passing test result is obtained.
4. Cabling Testing
    a. All cables will be permanently installed in their final locations prior to conducting final acceptance testing.
    b. Horizontal Cabling
        i. Horizontal cabling will be tested IAW TIA-568 requirements to include:
            1. A permanent link test from the termination device in the EF, TER, and TR(s) to each individual modular jack. The performance testing will include the following tests:
                - Wire map.
                - Length (physical vs. electrical, and length requirements).
                - Insertion loss.
                - Near-end crosstalk (NEXT) loss.
                - Power sum near-end crosstalk (PSNEXT) loss.
                - Equal-level far-end crosstalk (ELFEXT).
                - Power sum equal-level far-end crosstalk (PSELFEXT).
                - Return loss.
                - Propagation delay.
                - Delay skew.
    c. Multi-Pair Copper Cabling
        i. Each pair will be tested IAW TIA-568 requirements to include:
            1. Wire map (pin-to-pin continuity).
            2. Continuity to remote end.
            3. Crossed pairs.
            4. Reversed pairs.
            5. Split pairs.

6. Shorts between two or more conductors.

d. Single-Mode Fiber Optic Cabling
    i. Each fiber strand will be tested IAW the requirements of UFC 3-580-01.
        1. Each fiber strand will be tested end-to-end, including termination devices.
        2. The testing method will comply with TIA 526-7A using the single jumper method.
        3. All tests will be conducted at both the 1310 nanometer (nm) and 1550 nm wavelengths.
        4. All tests will be bi-directional.
        5. All connectors and bulkheads will be thoroughly cleaned prior to performing any testing.
    ii. Two separate tests will be conducted on each fiber strand.
        1. Optical Loss (a.k.a. Power Meter)
            a. Three-second auto-test optical loss measurement of each strand of fiber with distance measurement and optical loss budget calculation.
        2. Optical Time Domain Reflectometer (OTDR)
            a. A minimum 0.63 mile (1 kilometer) long launch and receive cable will be used for all OTDR testing.
            b. Optical Return Loss (ORL) with graphical view of each fiber strand.
e. Telecommunications Bonding System
    i. All testing will be conducted IAW TIA-607 requirements using the two-point ground/continuity testing method.
    ii. The test will be performed in the following areas:
        1. PBB/SBB to the electrical ground in Distributors.
        2. PBB/SBB to the structural metal.
        3. PBB to SBB(s).
        4. Structural metal to the electrical ground.
    iii. The maximum value for resistance between any point in the telecommunications bonding system will be 100 milliohms unless long TBC and/or BBC conductor runs are present. In the case of long TBB and BBC conductor runs, the resistance of the conductor shall be factored into the total resistance. For example, 1 km of a 3/0 AWG conductor has a resistance of 0.2028 ohms. (0.06180 ohms per 1000 ft).

Part 4 Test Reports Delivery

1. The test reports will be reviewed, approved, and stamped by a BICSI RCDD. The RCDD stamp will be on the test report title page. The test reports will be delivered in one consolidated PDF document. Both the summary and detailed test reports will be included for all cables tested. All summary and detailed test reports will indicate the cable label and cable ID of the cable tested. All detailed test reports will include the date of calibration for the test instrument used.
2. The test report will be formatted and will include all required items as listed in the ARNEC.

Testing Equipment

Manufacturer Data Sheets

(NOTE: Insert Testing Equipment Data Sheets in this Section)

SPECIFICATION 33 82 00.00 48

Telecommunications Outside Plant (OSP) Final Acceptance Test Plan

Project: Anywhere, USA Army Reserve Center

Test Plan Rev. 0

Date: May 8, 2024

Prepared By: **The Best Low-Voltage Company, LLC**

Reviewed By: **Steve Smith, RCDD**

NOTE: THIS IS A SAMPLE TEST PLAN ONLY. IT IS NOT INTENDED TO BE REPRESENTATIVE OF THE TEST REQUIREMENTS FOR ALL PROJECTS. THE CONTRACTOR'S ACTUAL TEST PLAN MUST BE CUSTOMZED FOR THEIR PROJECT AND MUST INCLUDE THE TESTING REQUIREMENTS AS SPECIFIED IN THE CONTRACT SPECIFICATIONS OF THAT PROJECT.

Part 1 Testing Objectives

1. The objective of this test plan is to document the test equipment, testing methodology, and process for the delivery of the test reports. All test equipment will be calibrated and recertified no more than one year prior to conducting any test. Certificates of calibration for each piece of test equipment listed in part 2 will be provided with the final acceptance test reports. This test plan has been developed IAW the contract specifications for this project.

Part 2 Test Instruments

Manufacturer	Model	Used to Test
		Single-Mode Fiber (Optical Loss)
		Single-Mode Fiber (Optical Time Domain Reflectometer)
		Multi-Pair Copper
		Maintenance Hole/Hand Hole Grounding/Bonding System

Part 3 Testing Methodology

1. All testing will be conducted IAW the requirements listed in the ARNEC, UFC 3-580-01, and applicable TIA standards.
2. Visual Inspection.
    a. Prior to conducting any testing, multi-pair copper cabling, single mode fiber cabling, and all maintenance hole grounding/bonding components will be visually inspected. This visual inspection will include:
        i. Cabling and components will be inspected for any rips, tears, stretch marks, irregular bends, and other deformities.
        ii. Proper labeling of all cabling and components
        iii. Proper cable placement, terminations, bonding connections, and required cable slack.
3. Failed Test Reports
    a. Failed test reports will not be submitted. Any cabling or component that fails any test will have the issue(s) corrected and the testing re-done until a passing test result is obtained.
4. Cabling Testing
    a. Multi-Pair Copper Cabling
        i. Each pair will be tested IAW TIA-568 requirements to include:
            1. Wire map (pin-to-pin continuity).
            2. Continuity to remote end.
            3. Crossed pairs.
            4. Reversed pairs.
            5. Split pairs.
            6. Shorts between two or more conductors.
    b. Single-Mode Fiber Cabling
        i. Each fiber strand will be tested IAW the requirements of UFC 3-580-01.
            1. Each fiber strand will be tested end-to-end, including termination devices.
            2. The testing method will comply with TIA 526-7A using the single jumper method.
            3. All tests will be conducted at both the 1310 nm and 1550 nm wavelengths.
            4. All tests will be bi-directional.
            5. All connectors and bulkheads will be thoroughly cleaned prior to performing any testing.
        ii. Two separate tests will be conducted on each fiber strand.
            1. Optical Loss (a.k.a. Power Meter)
                a. Three-second auto-test optical loss measurement of each strand of fiber with distance measurement and optical loss budget calculation.

2. Optical Time Domain Reflectometer (OTDR)
    a. A minimum 0.63 mile (1 kilometer) long launch and receive cable will be used for all OTDR testing.
3. Optical Return Loss (ORL) with graphical view of each fiber strand.

5. Maintenance Hole Grounding/Bonding System
    a. All testing will be conducted IAW TIA-607 requirements using the three-pole fall-of-potential method.
    b. The maximum value for resistance will be 25 ohms.
6. Duct Proofing
    a. All conduits must be proofed prior to the installation of any components (e.g., mule tape, inner-duct, cable).
    b. Conduct all mandrel tests after ducts have been cleaned.
    c. Proofing a conduit consists of pulling a test mandrel through the duct to ensure the integrity and alignment of the ducts.
    d. Ducts must be proofed with a test mandrel that is approximately 12 inches (300 millimeters) in length. The width of the test mandrel can be no more than 0.5 inches (13 millimeters) less than the duct inside diameter.
    e. A U.S. government representative must be present to witness the tests.
    f. Ducts shall be sealed and/or plugged immediately after the ducts have been proofed.

Part 4 Test Reports Delivery

1. All test reports will be reviewed and approved by the low-voltage contractor's RCCD. The test reports will be delivered in one consolidated PDF document. Both the summary and detailed test reports will be included for all cables tested. All summary and detailed test reports will indicate the cable label and cable ID of the cable tested. Interbuilding cabling testing shall include the building and room identifiers. All detailed test reports will include the date of calibration for the test instrument and the date the test was conducted.
    a. This document will include the following items formatted as described:
        i. Title Page with low-voltage contractor's RCDD stamp.
        ii. Table of Contents. The Table of Contents will indicate the page numbers for each section.
        iii. Separate sections (with header page for each section) for the training building test reports.
            1. The telecommunications equipment room (TER) section will contain:
                a. Multi-pair copper cabling test reports for each pair terminated in the TER to the Vehicle Maintenance Shop (VMS) TR.
                b. Single-mode fiber optical loss (power meter) test reports for each fiber strand from the TER to the VMS TR.
                c. Single-mode OTDR test reports for each fiber strand from the TER to the VMS TR.
        iv. Maintenance hole (with header page) grounding/bonding system test report.
        v. Documentation of the approved mandrel testing.

Testing Equipment

Manufacturer Data Sheets

(NOTE: Insert Testing Equipment Data Sheets in this Section)

THE DIAGRAMS AND FIGURES PROVIDED IN THIS APPENDIX PROVIDE ADDITIONAL REQUIREMENTS AND GUIDANCE. THE PURPOSE OF THESE DIAGRAMS IS TO SHOW REQUIRED COMPONENTS, MOUNTING HEIGHTS, TYPICAL ROOM AND WALL, RACK LAYOUTS, LABELING REQUIREMENTS, ETC.

APPENDIX C

ARNEC

U.S. ARMY RESERVE

NETWORK ENTERPRISE CENTER

INFRASTRUCTURE TECHNICAL CRITERIA

DIAGRAMS AND DETAILS

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.01

SYMBOL				OUTLET DESCRIPTION	JACK QUANTITY
WALL MOUNTED	ABOVE CEILING MOUNTED	FURNITURE MOUNTED	FLOOR MOUNTED		
				STANDARD OUTLET	1 JACK
X				STANDARD OUTLET	“X” DENOTES NUMBER OF REQUIRED JACKS
	WAP			WIRELESS ACCESS POINT (WAP) OUTLET (ABOVE ACCESSIBLE CEILING SPACE)	2 JACKS
WAP				WIRELESS ACCESS POINT (WAP) OUTLET (HIGH HEIGHT CEILING/OPEN CEILING)	2 JACKS
			X	FLOOR BOX OUTLET	“X” DENOTES NUMBER OF REQUIRED JACKS
IDS				IDS PANEL	2 CABLES (SEE ARNEC SECTION, APPENDIX A)
DDC				DIRECT DIGITAL CONTROL SYSTEM (DDC) PANEL CABLE	1 CABLE (SEE ARNEC, APPENDIX A)
W				WALL PHONE OUTLET	1 JACK
MFD				MULTI-FUNCTION DEVICE OUTLET	2 JACKS
		M		MODULAR FURNITURE OUTLET	1 JACK
		M“X”		MODULAR FURNITURE OUTLET	“X” DENOTES NUMBER OF REQUIRED JACKS
TV				SMART TV OUTLET (INSTALL ON WALL BEHIND TV LOCATION. MOUNTING HEIGHT PER DESIGN)	1 JACK

OUTLET SYMBOL LEGEND

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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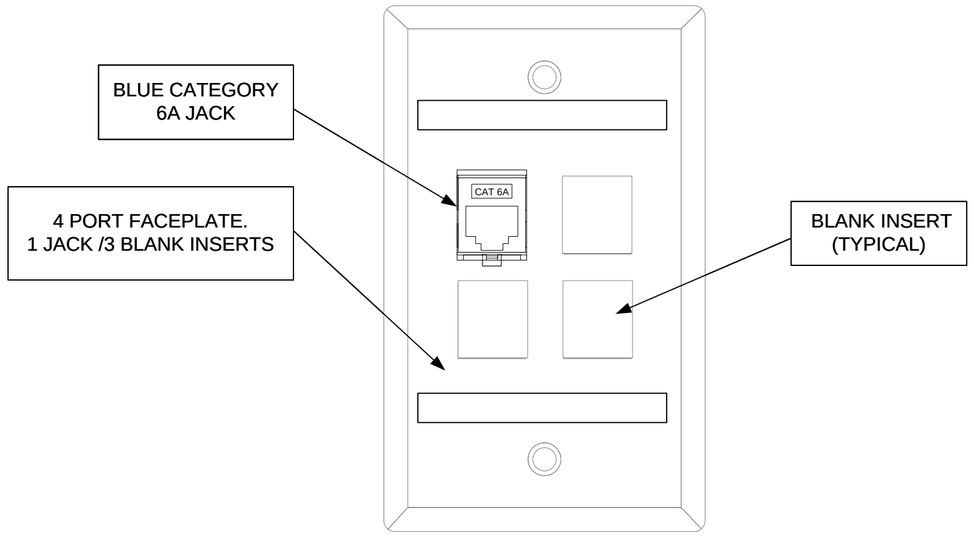
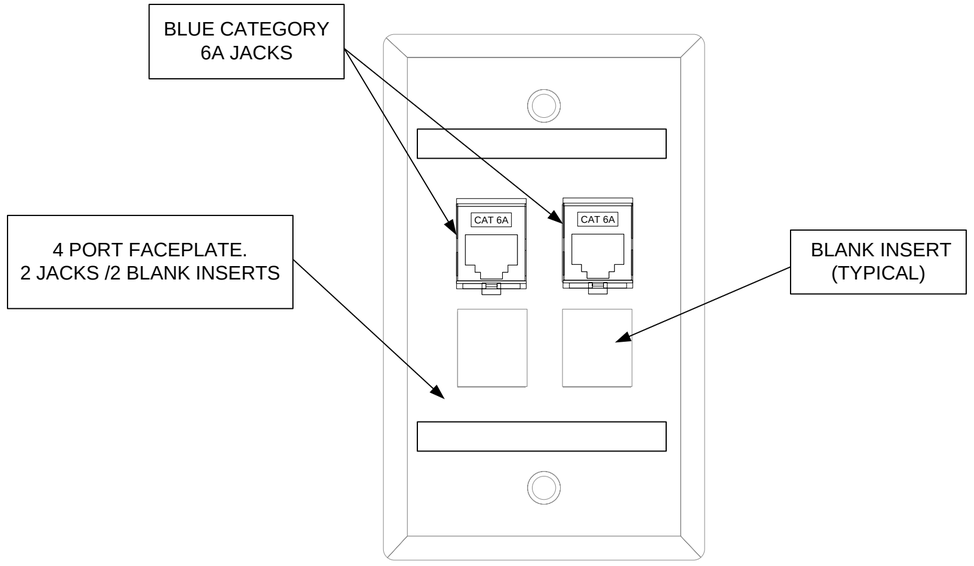
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

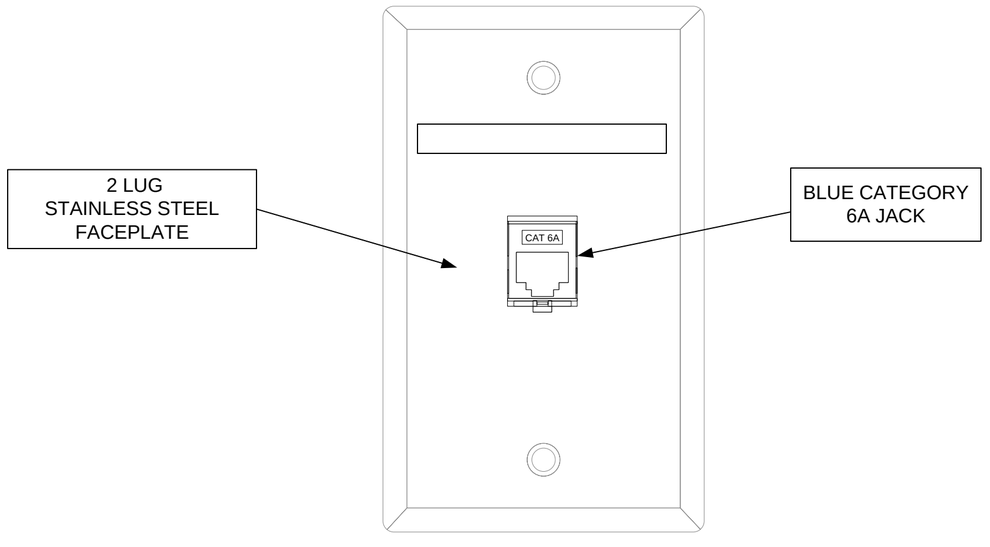
C.02



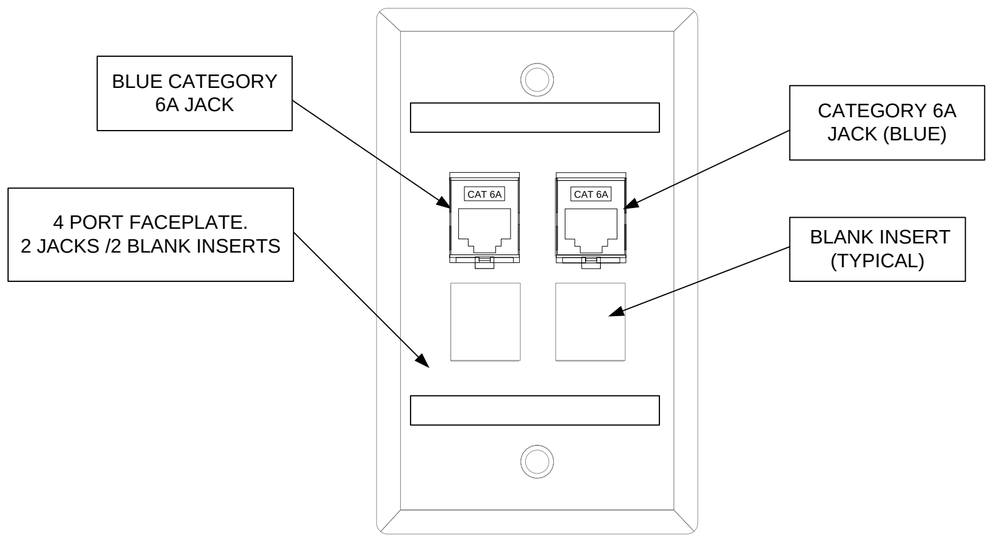
1 STANDARD OUTLET



2 WIRELESS ACCESS POINT (WAP) OUTLET



3 WALL PHONE OUTLET



4 MFD OUTLET

OUTLET FACEPLATE TYPES

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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U.S. ARMY RESERVE
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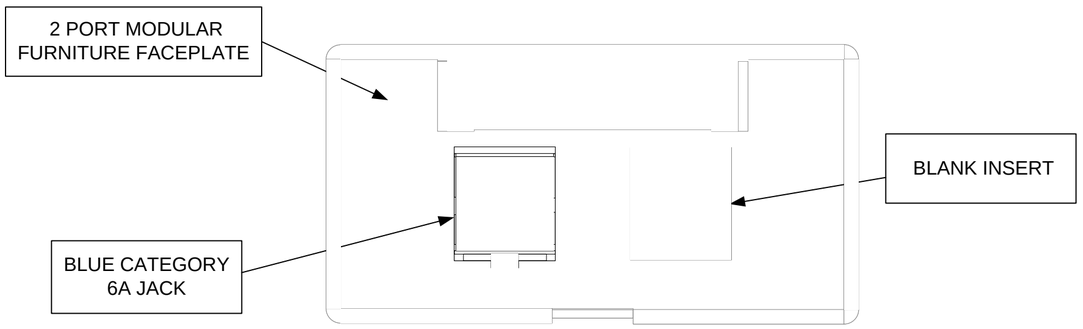
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.03



1

MODULAR FURNITURE OUTLET

OUTLET FACEPLATE TYPES

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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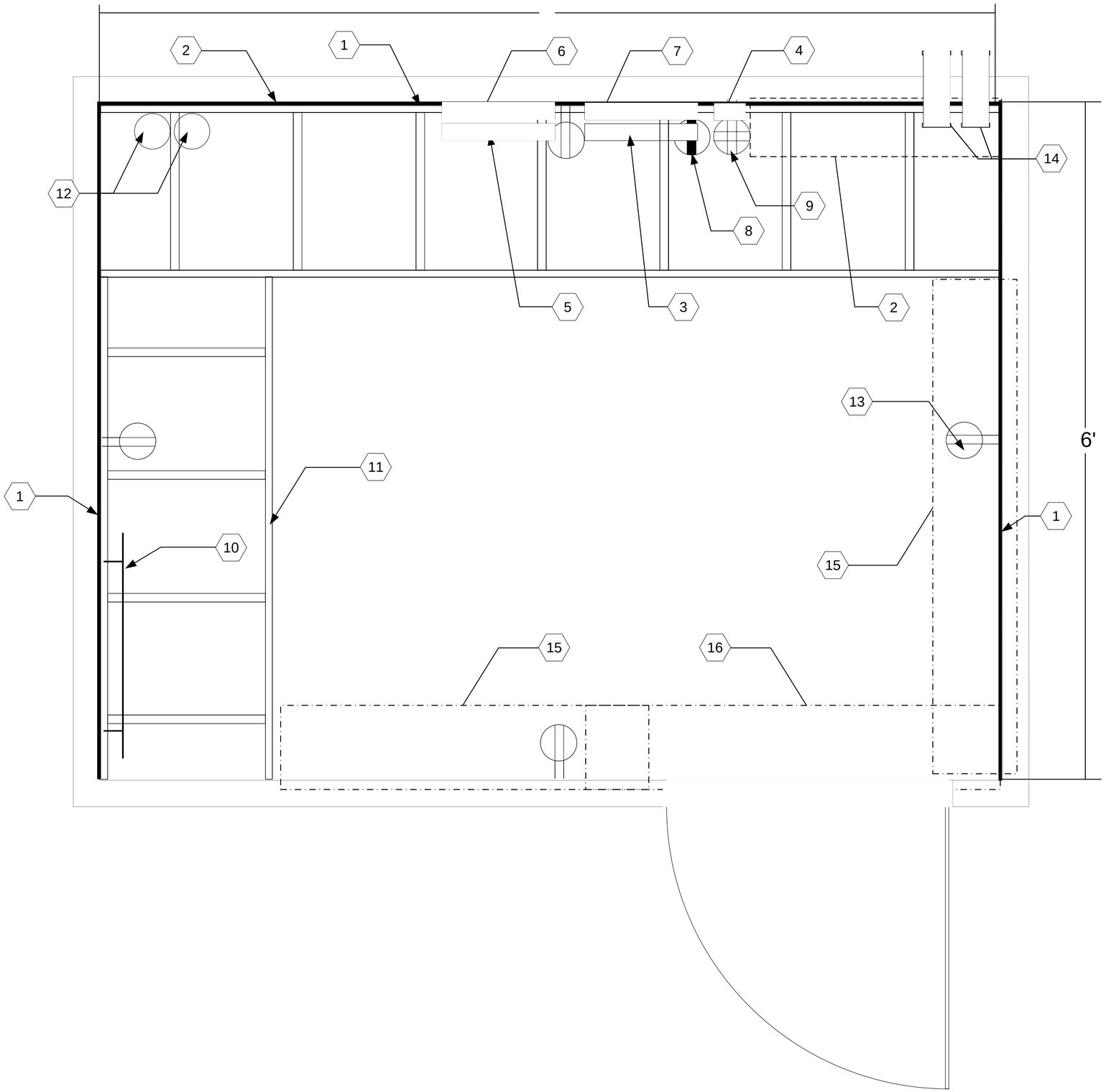
DIAGRAM AND DETAILS

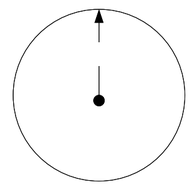
C.04



1. PLYWOOD BACKBOARD (3 OF 4 WALLS)
2. SPACE RESERVED FOR SERVICE PROVIDER INSTALLED EQUIPMENT
3. SERVICE PROVIDER INSTALLED BUILDING ENTRANCE PROTECTOR FOR COPPER BACKBONE CABLE
4. SERVICE PROVIDER COPPER BACKBONE TERMINATION BLOCK
5. SERVICE PROVIDER INSTALLED WALL MOUNTED FOPP
6. WALL MOUNTED FOPP FOR 12 STRAND FOC
7. STANDARD 110 BLOCK FOR 25 PAIR BACKBONE COPPER
8. NEMA L5-15R POWER RECEPTACLE
9. DOUBLE DUPLEX NEMA 5-20R POWER RECEPTACLE
10. PBB (MOUNT AS CLOSE AS PRACTICAL TO ELECTRICAL SUB-PANEL
11. HORIZONTAL LADDER RACK (TYPICAL OF ALL SHOWN)
12. CONDUIT TO SPPOC
13. NEMA 5-20 DUPLEX CONVENIENCE RECEPTACLE (TYPICAL OF ALL SHOWN)
14. STANDARD WALL SLEEVES OR SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING WALL SLEEVES (AS REQUIRED PER TECHNICAL CRITERIA)
15. SPACE RESERVED FOR ELECTRICAL SUB PANEL, HVAC EQUIPMENT, ACCESS CONTROL PANEL (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)
16. SPACE RESERVED FOR HVAC EQUIPMENT (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

PLAN NORTH



TYPICAL EF AERIAL DIAGRAM

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

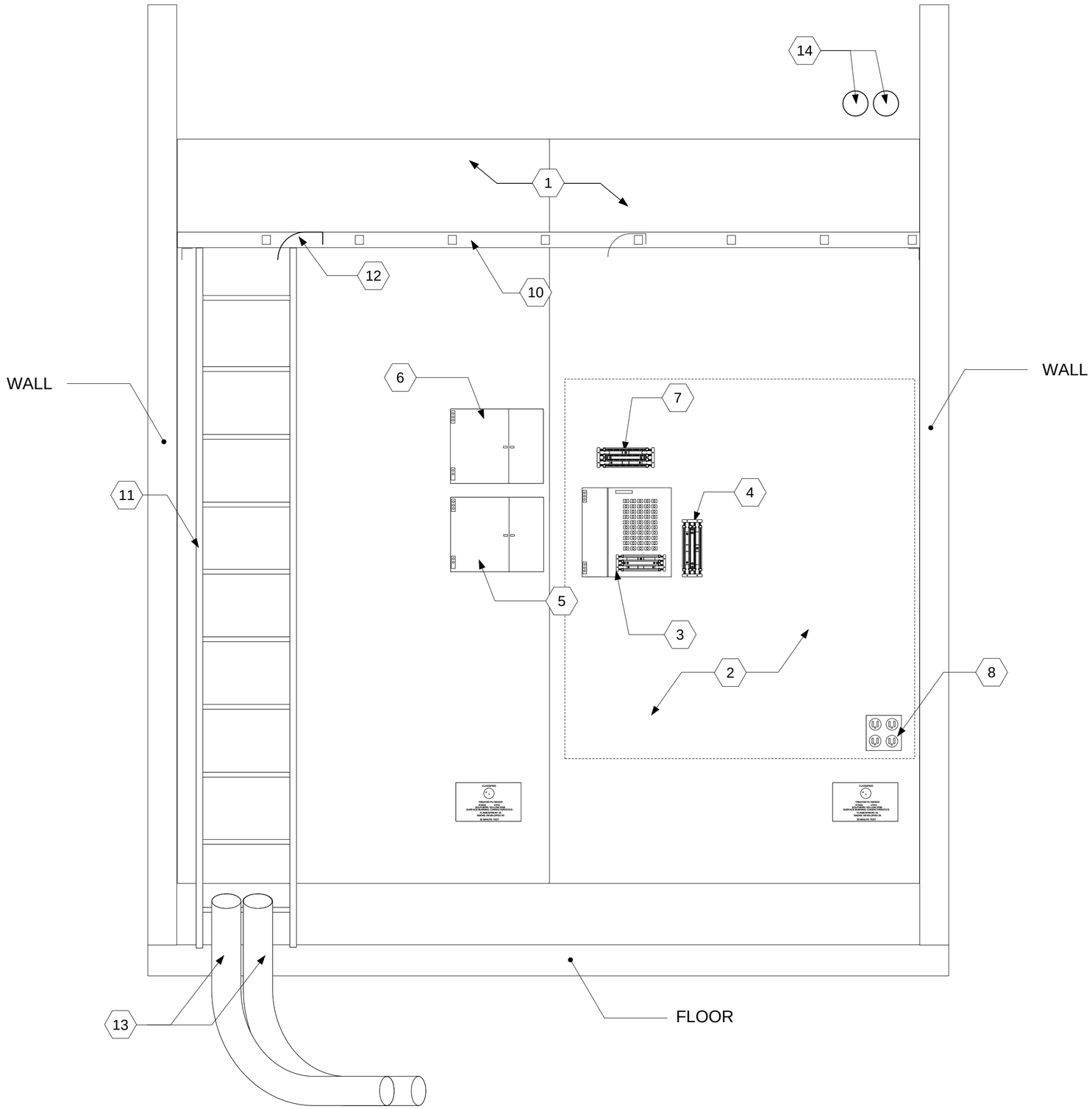
REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.05



TYPICAL EF WALL ELEVATION DIAGRAM (PLAN NORTH WALL)

SHEET KEY NOTES

1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. SPACE RESERVED FOR SERVICE PROVIDER INSTALLED EQUIPMENT
3. SERVICE PROVIDER INSTALLED BUILDING ENTRANCE PROTECTOR FOR COPPER BACKBONE CABLE
4. SERVICE PROVIDER INSTALLED COPPER TERMINATION BLOCK
5. SERVICE PROVIDER INSTALLED WALL MOUNTED FOPP
6. WALL MOUNTED FOPP FOR 12 STRAND FOC
7. 110 BLOCK FOR 25 PAIR ISP COPPER BACKBONE CABLE
8. DOUBLE DUPLEX NEMA 5-20R POWER RECEPTACLE
9. NEMA L5-15R POWER RECEPTACLE
10. HORIZONTAL LADDER RACK
11. VERTICAL LADDER RACK
12. CABLE RADIUS DROP OUTS (WATERFALL SUPPORTS)
13. CONDUIT TO SPPOC
14. STANDARD WALL/CEILING SLEEVES OR SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING WALL SLEEVES (AS REQUIRED PER TECHNICAL CRITERIA)

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

ARMY RESERVE

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPR.
2			

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.06

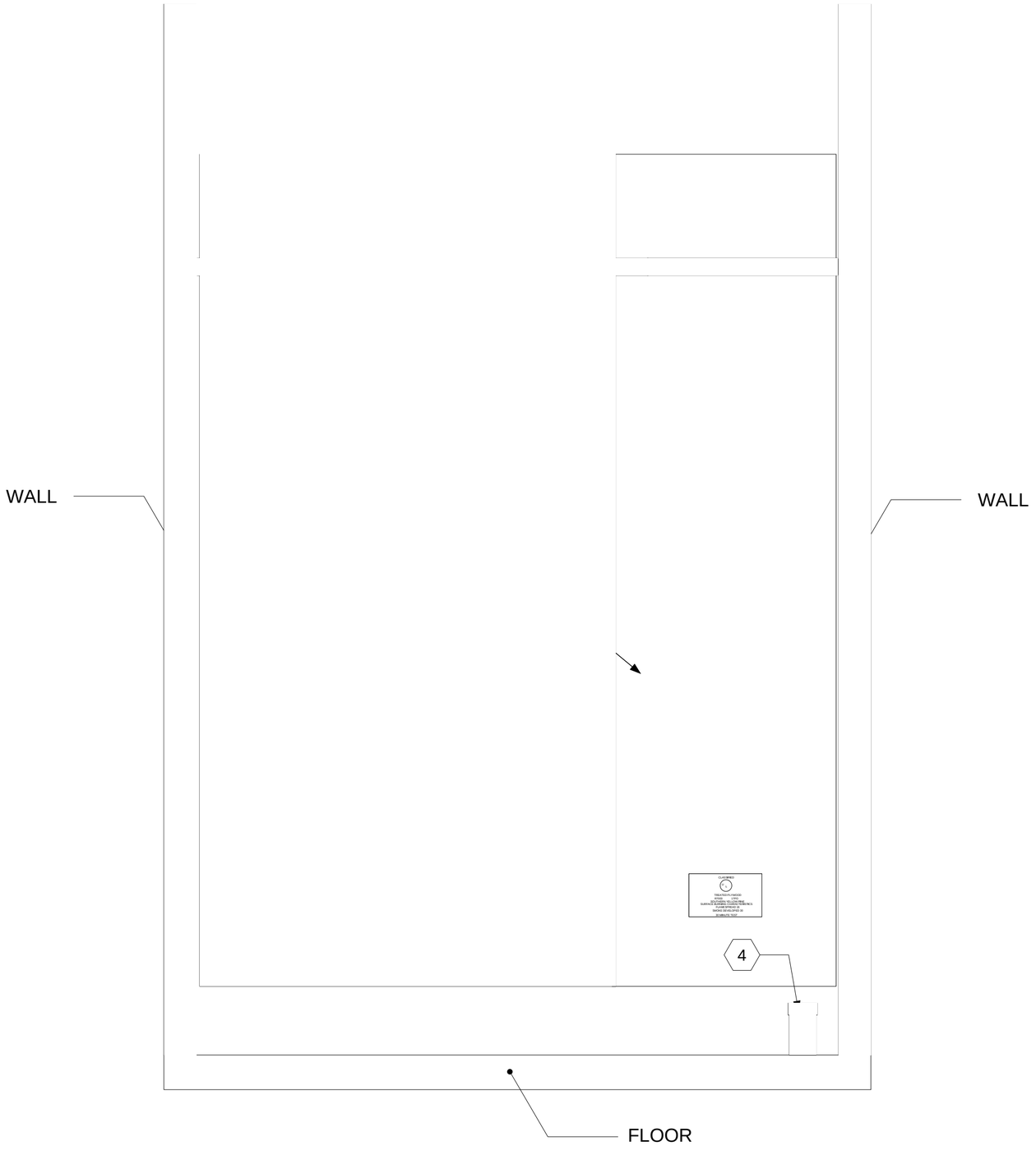
1 PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)

2 PBB

3 HORIZONTAL LADDER RACK

4 CONDUIT TO SPPOC

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.



TYPICAL EF WALL ELEVATION DIAGRAM (PLAN WEST WALL)

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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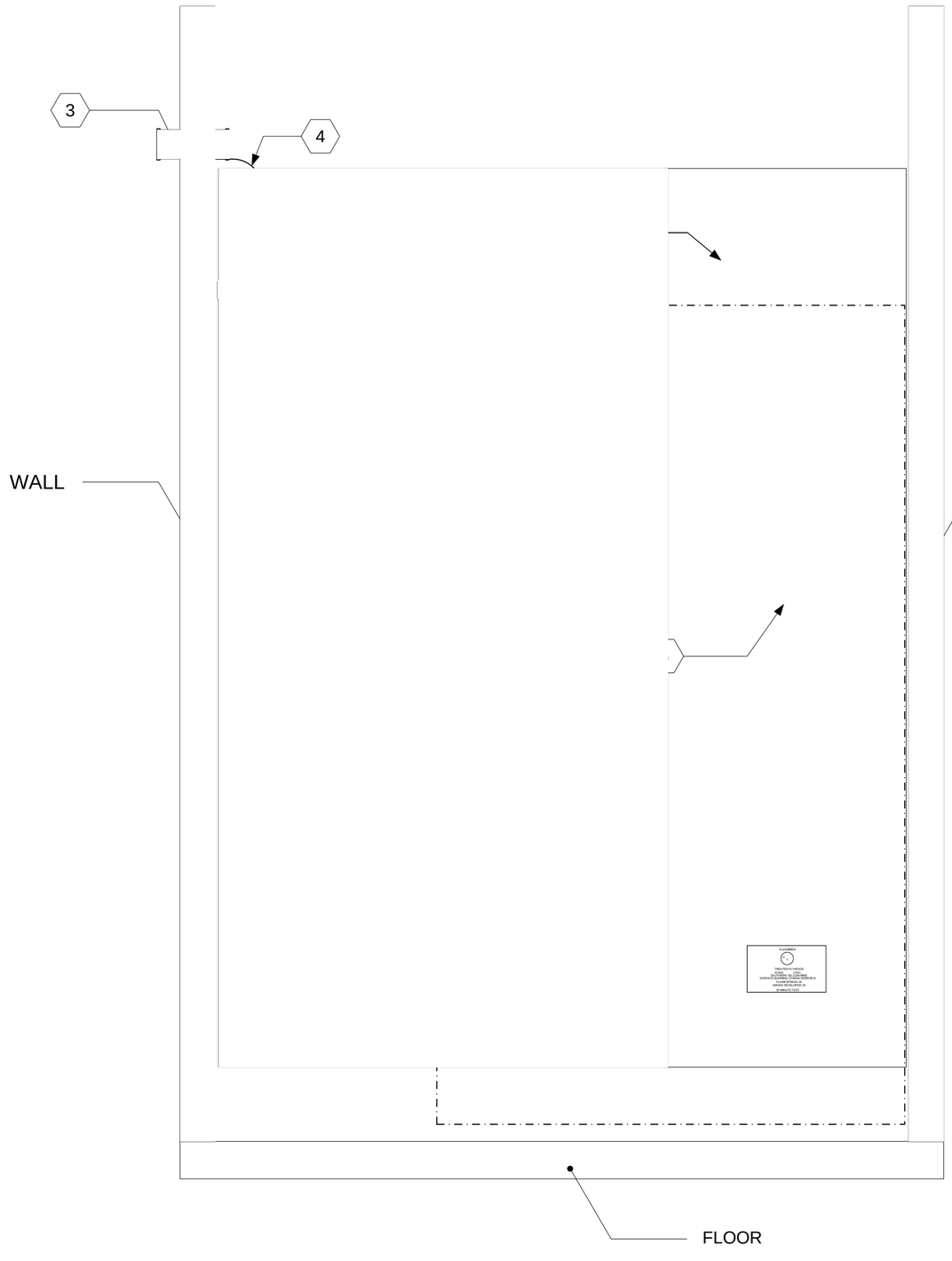
U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.07



1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. HORIZONTAL LADDER RACK
3. STANDARD WALL SLEEVES OR SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING WALL SLEEVES (AS REQUIRED PER TECHNICAL CRITERIA)
4. CABLE RADIUS DROP OUTS (WATERFALL SUPPORTS)
5. SPACE RESERVED FOR ELECTRICAL SUB PANEL, ACCESS CONTROL PANEL (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

TYPICAL EF WALL ELEVATION DIAGRAM (PLAN EAST WALL)

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

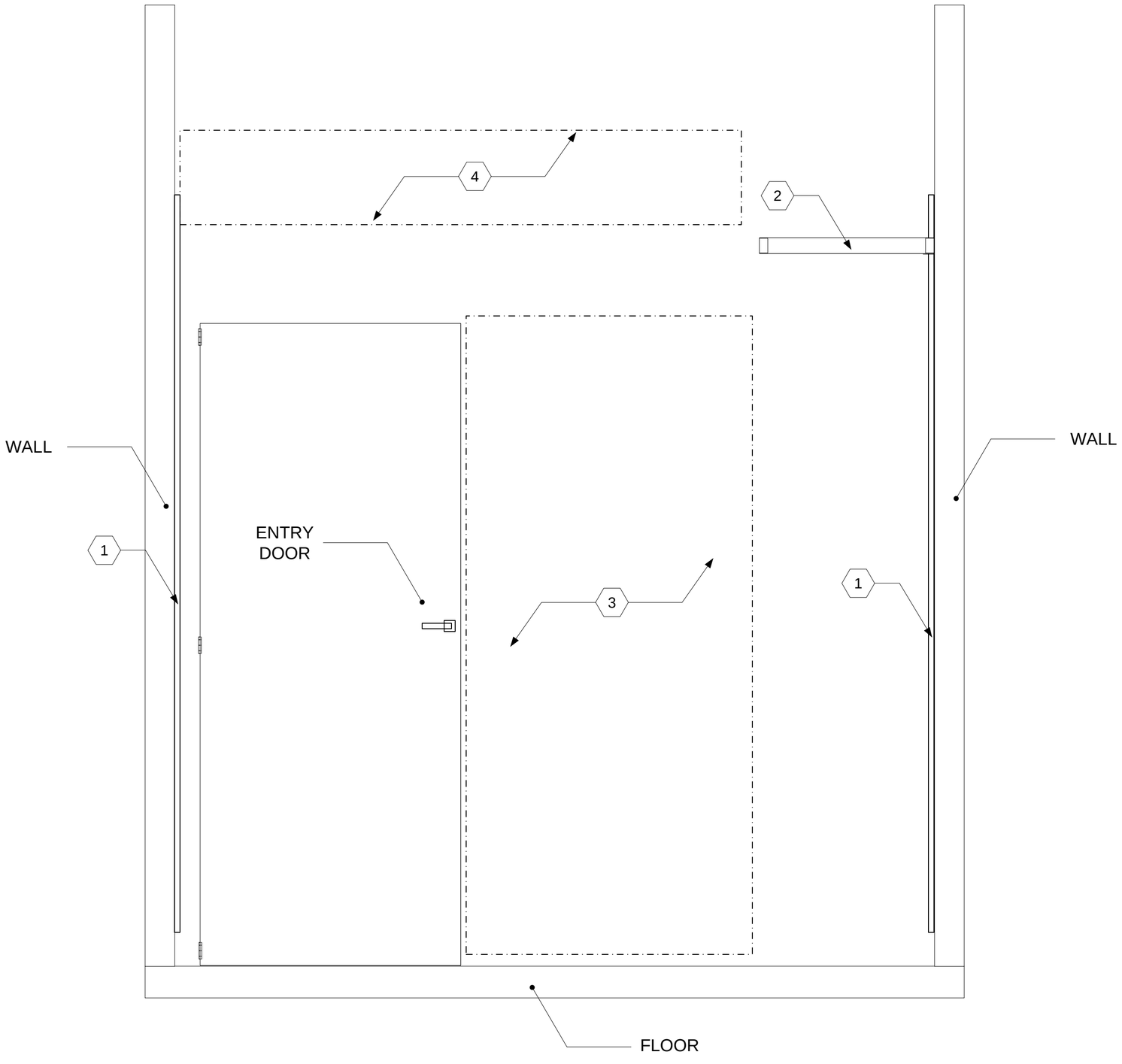
REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE NETWORK ENTERPRISE CENTER INFRASTRUCTURE TECHNICAL CRITERIA DIAGRAM AND DETAILS

C.08



SHEET KEY NOTES

1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. HORIZONTAL LADDER RACK
3. SPACE RESERVED FOR ELECTRICAL SUB PANEL AND OR ACCESS CONTROL PANEL (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)
4. SPACE RESERVED FOR HVAC EQUIPMENT (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

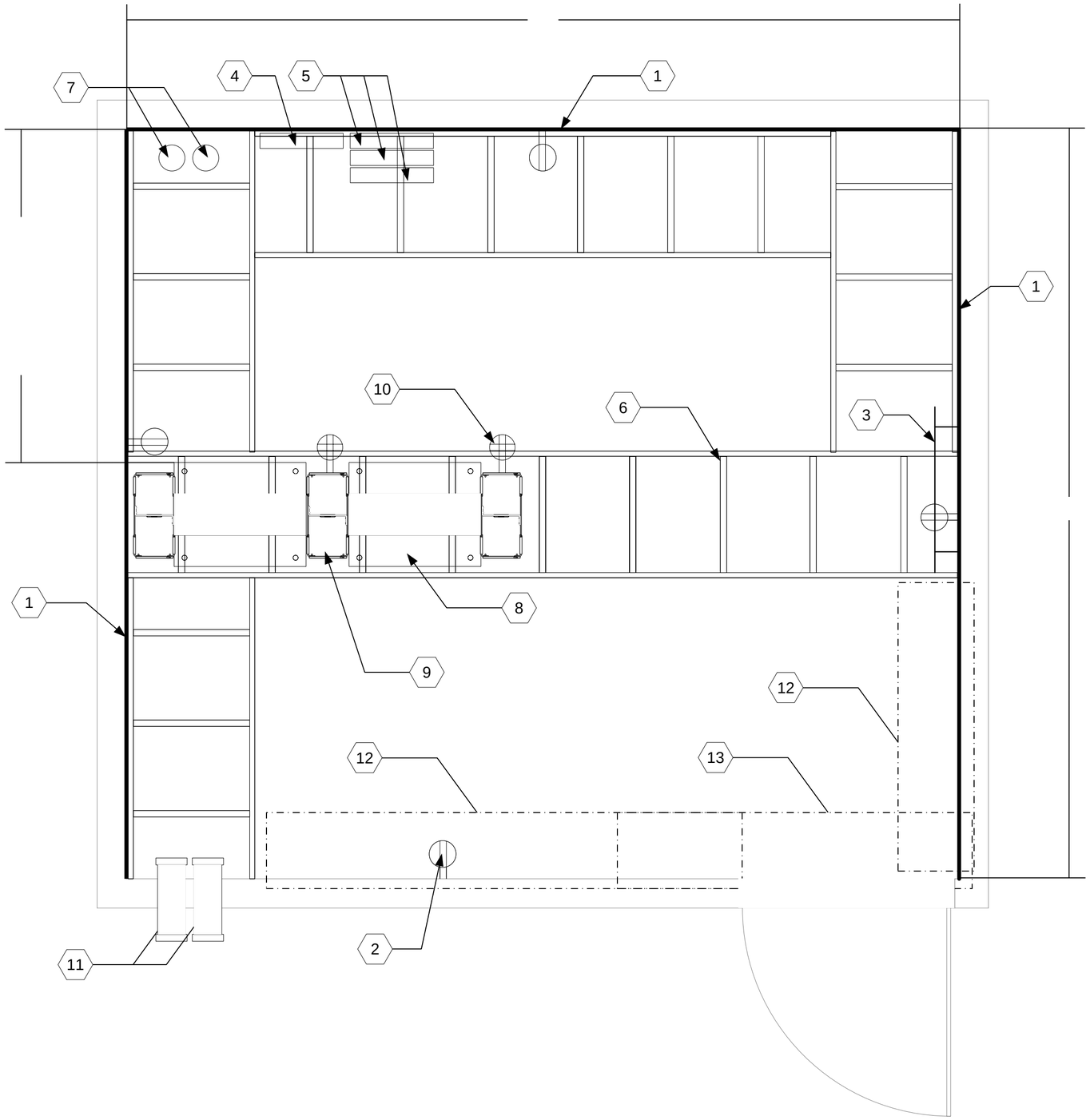
APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.09

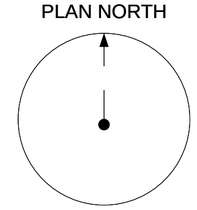
TYPICAL EF WALL ELEVATION DIAGRAM (PLAN SOUTH WALL)



1. PLYWOOD BACKBOARD (3 OF 4 WALLS)
2. NEMA 5-20 DUPLEX CONVENIENCE RECEPTACLE (TYPICAL OF ALL SHOWN)
3. SBB (LOCATE AS CLOSE AS PRACTICAL TO THE ELECTRICAL SUBPANEL WHILE REMAINING UNDERNEATH OF THE LADDER RACK)
4. PET FOR OSP COPPER BACKBONE CABLE
5. 25 PAIR PRE-CONNECTORIZED 110 BLOCKS FOR COPPER BACKBONE CABLE TERMINATION
6. HORIZONTAL LADDER RACK
7. OSP CONDUITS TO BUILDING XXX TR XXX
8. TELECOMMUNICATIONS EQUIPMENT RACK (TYPICAL OF ALL SHOWN)
9. VERTICAL WIRE MANAGERS (TYPICAL OF ALL SHOWN)
10. EQUIPMENT RACK RECEPTACLES (TYPICAL OF ALL SHOWN)
11. STANDARD WALL SLEEVES OR SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING WALL SLEEVES (AS REQUIRED PER TECHNICAL CRITERIA)
12. SPACE RESERVED FOR ELECTRICAL SUB PANEL AND OR ACCESS CONTROL PANEL (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)
13. SPACE RESERVED FOR HVAC EQUIPMENT (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

PLAN NORTH



TYPICAL TER AERIAL DIAGRAM

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

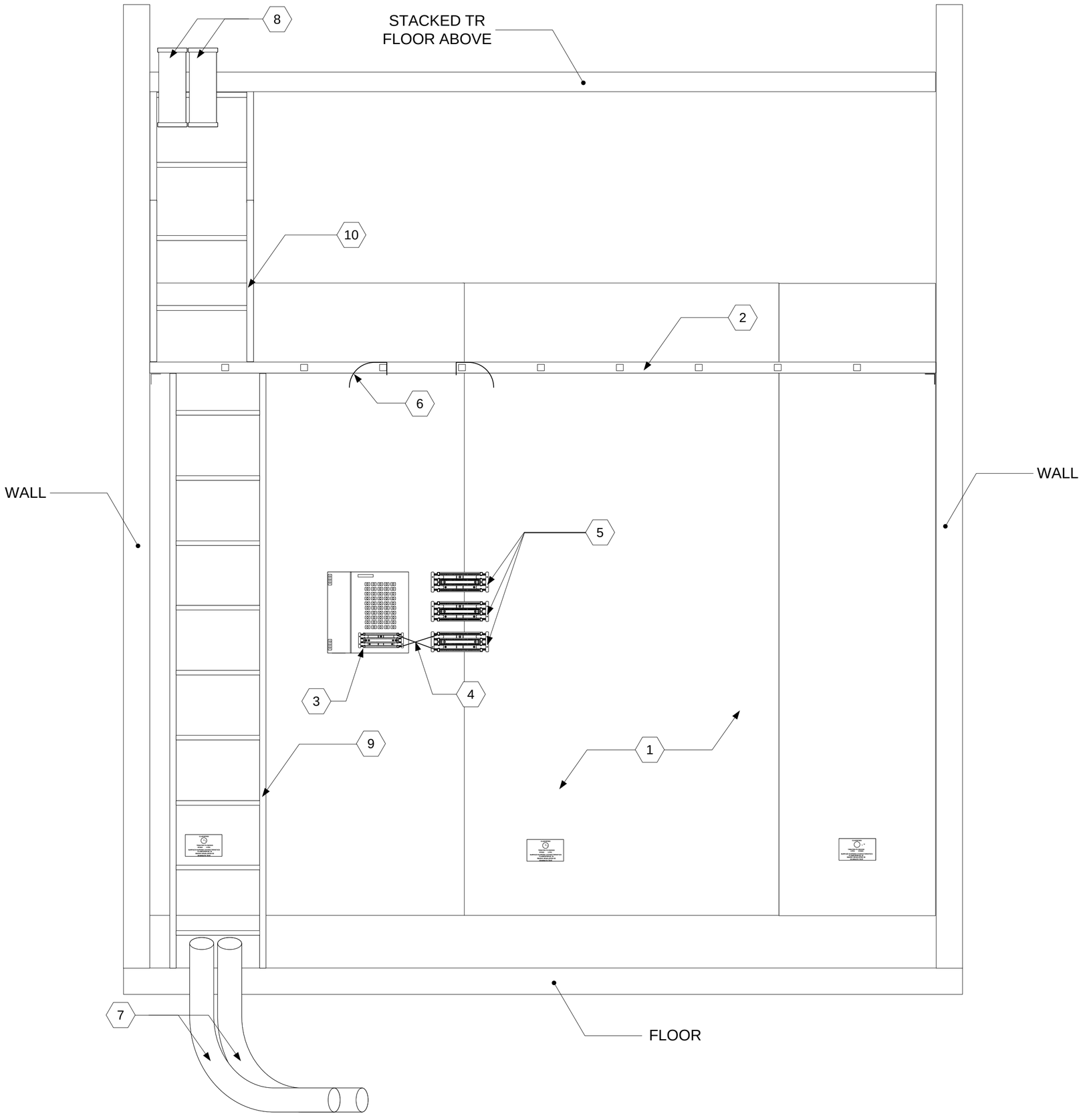
REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.10



SHEET KEY NOTES

1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. HORIZONTAL LADDER RACK
3. PET FOR OSP COPPER BACKBONE CABLE
4. 25 PAIR EXTENTION FROM BET TO 25 PAIR PRE-CONNECTORIZED 110 BLOCK
5. 25 PAIR PRE-CONNECTORIZED 110 BLOCK FOR 25 PAIR COPPER BACKBONE CABLE
6. CABLE RADIUS DROP OUTS (WATERFALL SUPPORTS) TYPICAL OF ALL SHOWN
7. CONDUITS TO OTHER BUILDING TR
8. SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING FLOOR SLEEVES (IF APPLICABLE FOR STACKED TR ABOVE)
9. VERTICAL LADDER RACK

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

TYPICAL TER WALL ELEVATION DIAGRAM (PLAN NORTH WALL)

ARMY RESERVE

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

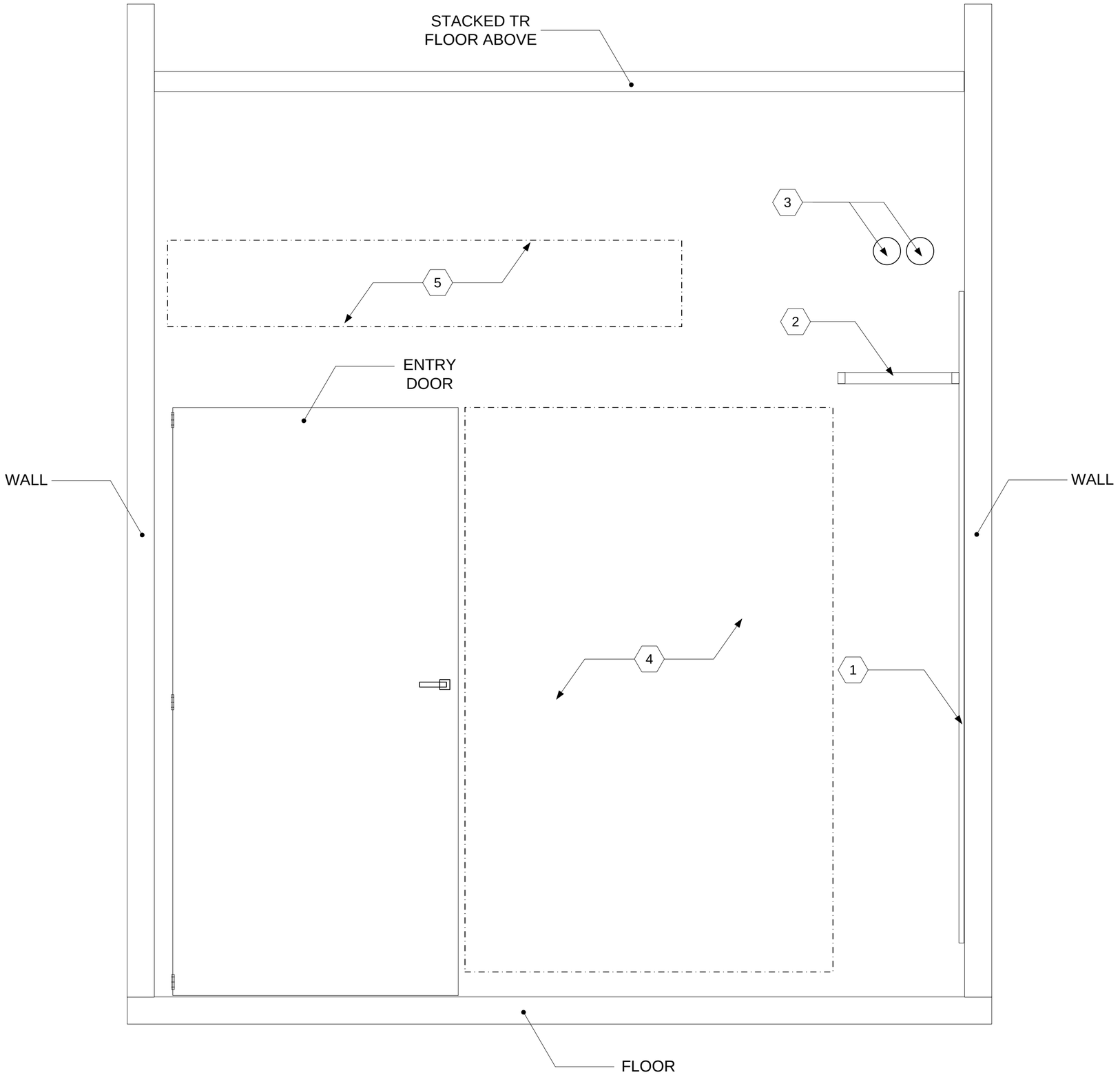
REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.11



SHEET KEY NOTES

1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. HORIZONTAL LADDER RACK
3. STANDARD WALL SLEEVES OR SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING WALL SLEEVES (AS REQUIRED PER TECHNICAL CRITERIA)
4. SPACE RESERVED FOR ELECTRICAL SUB PANEL AND OR ACCESS CONTROL PANEL (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)
5. SPACE RESERVED FOR HVAC EQUIPMENT (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

TYPICAL TER WALL ELEVATION DIAGRAM (PLAN SOUTH WALL)

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

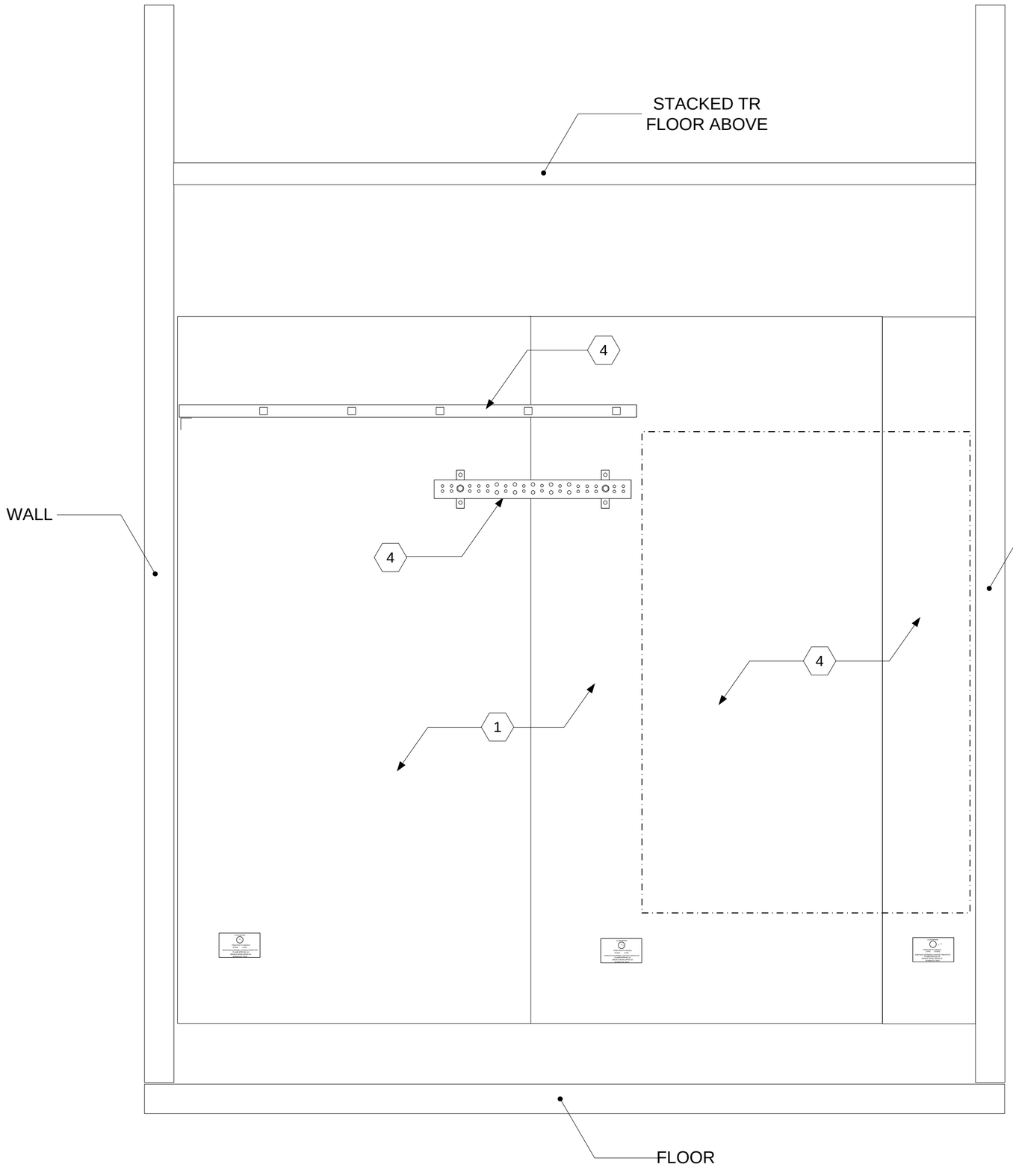
REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.12



SHEET KEY NOTES

1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. SBB
3. HORIZONTAL LADDER RACK
4. SPACE RESERVED FOR ELECTRICAL SUBPANEL (NO LADDER RACK CAN BE INSTALLED ABOVE ELECTRICAL SUBPANEL)

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

TYPICAL TER WALL ELEVATION DIAGRAM (PLAN EAST WALL)

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

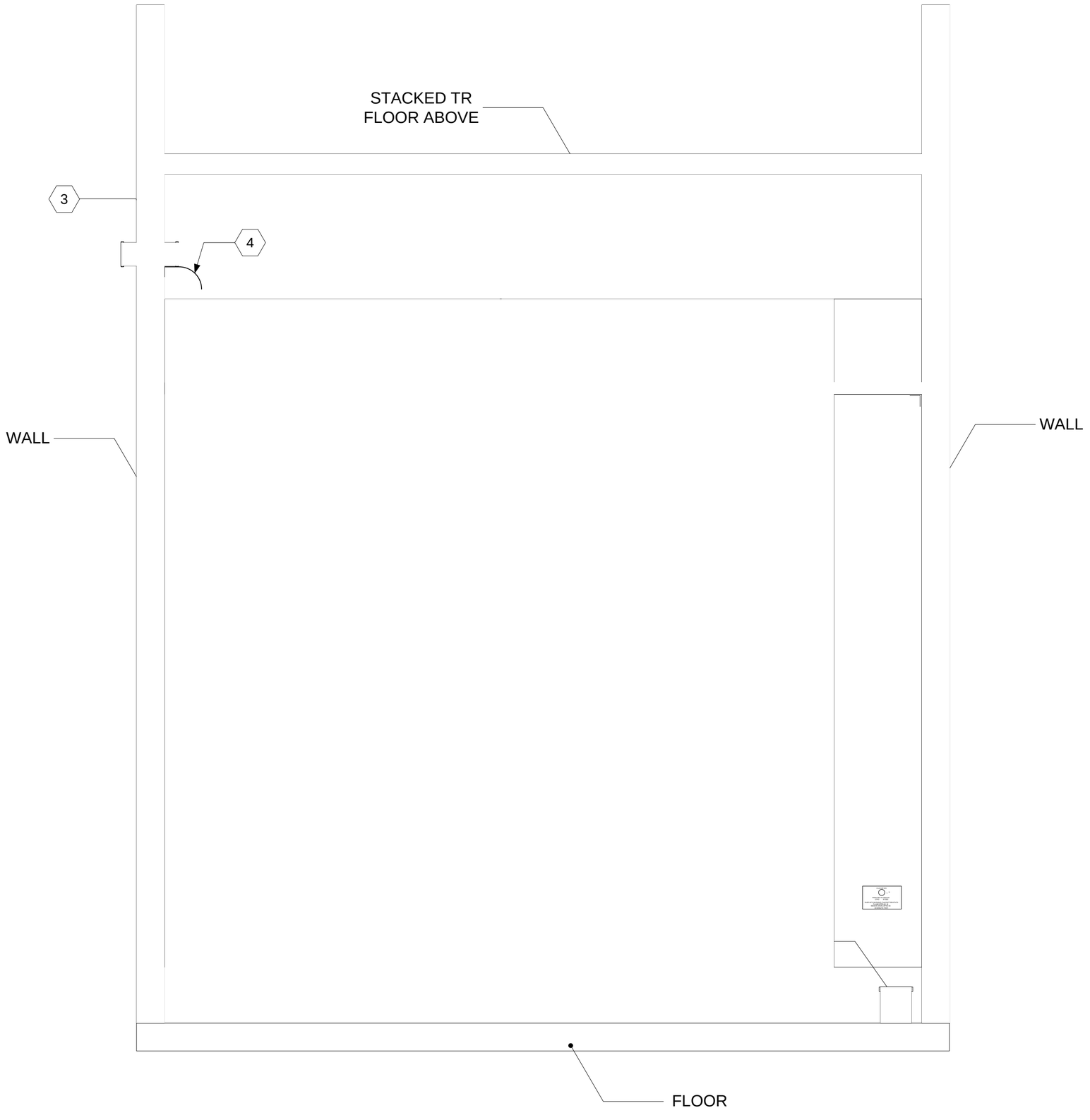
REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.13



1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. HORIZONTAL LADDER RACK
3. STANDARD WALL SLEEVES OR SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING WALL SLEEVES (AS REQUIRED PER TECHNICAL CRITERIA)
4. CABLE RADIUS DROP OUTS (WATERFALL SUPPORTS)
5. OSP CONDUITS TO OTHER BUILDING TR

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

TYPICAL TER WALL ELEVATION DIAGRAM (PLAN WEST WALL)

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

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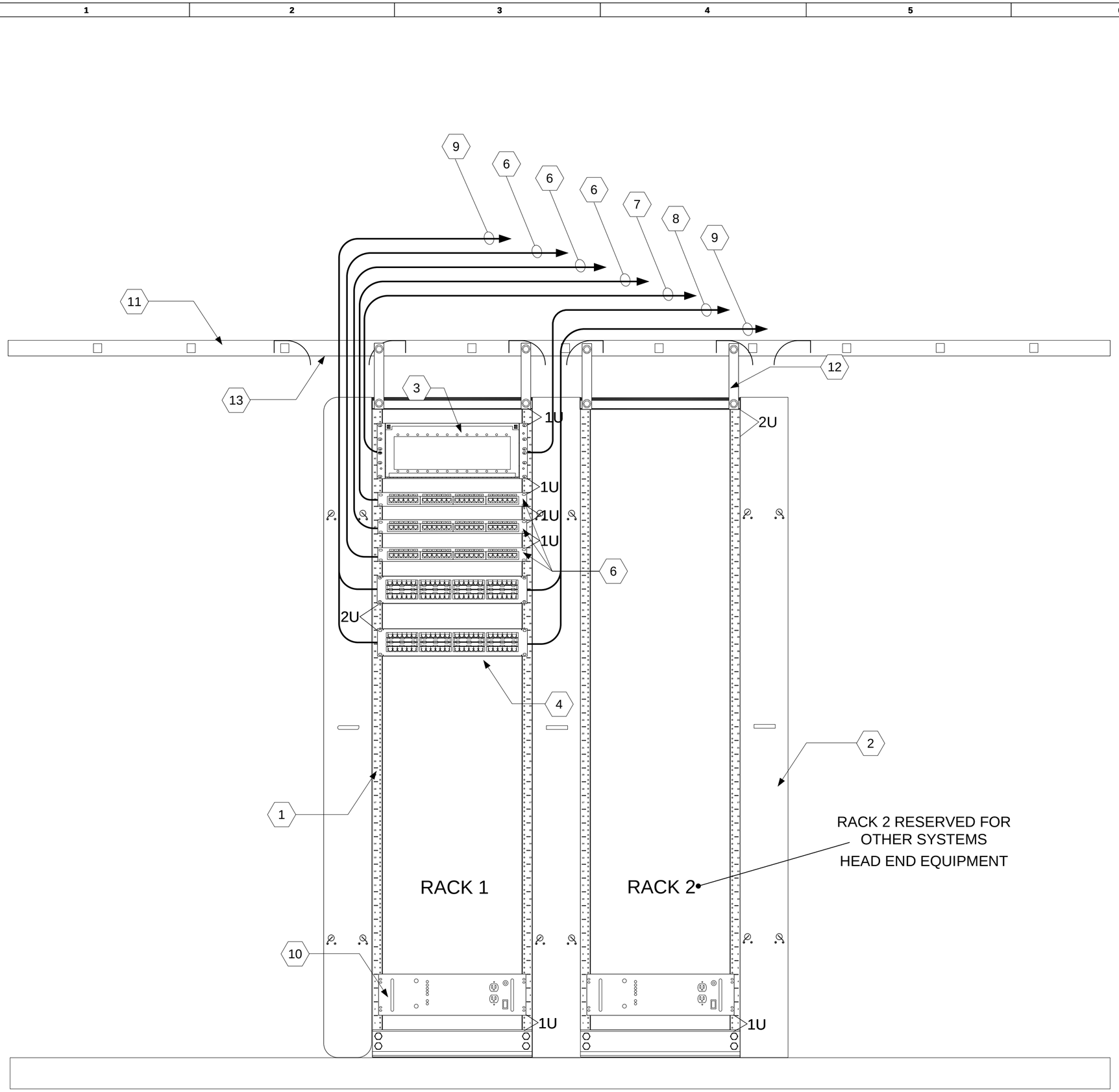
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.14



TYPICAL TER RACK FRONT ELEVATION DIAGRAM

SHEET KEY NOTES

1. 2 POST EQUIPMENT RACK (TYPICAL OF ALL SHOWN). RACK 2 TO REMAIN EMPTY AS A SPARE
2. VERTICAL WIRE MANAGER (TYPICAL OF ALL SHOWN)
3. 4U FIBER PATCH PANEL
4. 48 PORT PATCH PANEL FOR CATEGORY 6A CABLES (TYPICAL OF ALL SHOWN)
5. 24 PORT 8P2C TELCO PATCH PANEL
6. 25 PAIR AMPHENOL COPPER BACKBONE CABLE TO WALL MOUNTED 110 BLOCK (TYPICAL OF ALL SHOWN)
7. OSP/ISP 24 STRAND FOC TO OTHER TR(S)
8. 24 STRAND FOC TO EF
9. CATEGORY 6A HORIZONTAL CABLE
10. LINE CONDITIONER (GFGI)
11. HORIZONTAL LADDER RACK
12. 6 INCH RACK ELEVATION KITS (TYPICAL OF ALL SHOWN)
13. RADIUS DROP OUT KITS (TYPICAL OF ALL SHOWN)

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
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DIAGRAM AND DETAILS

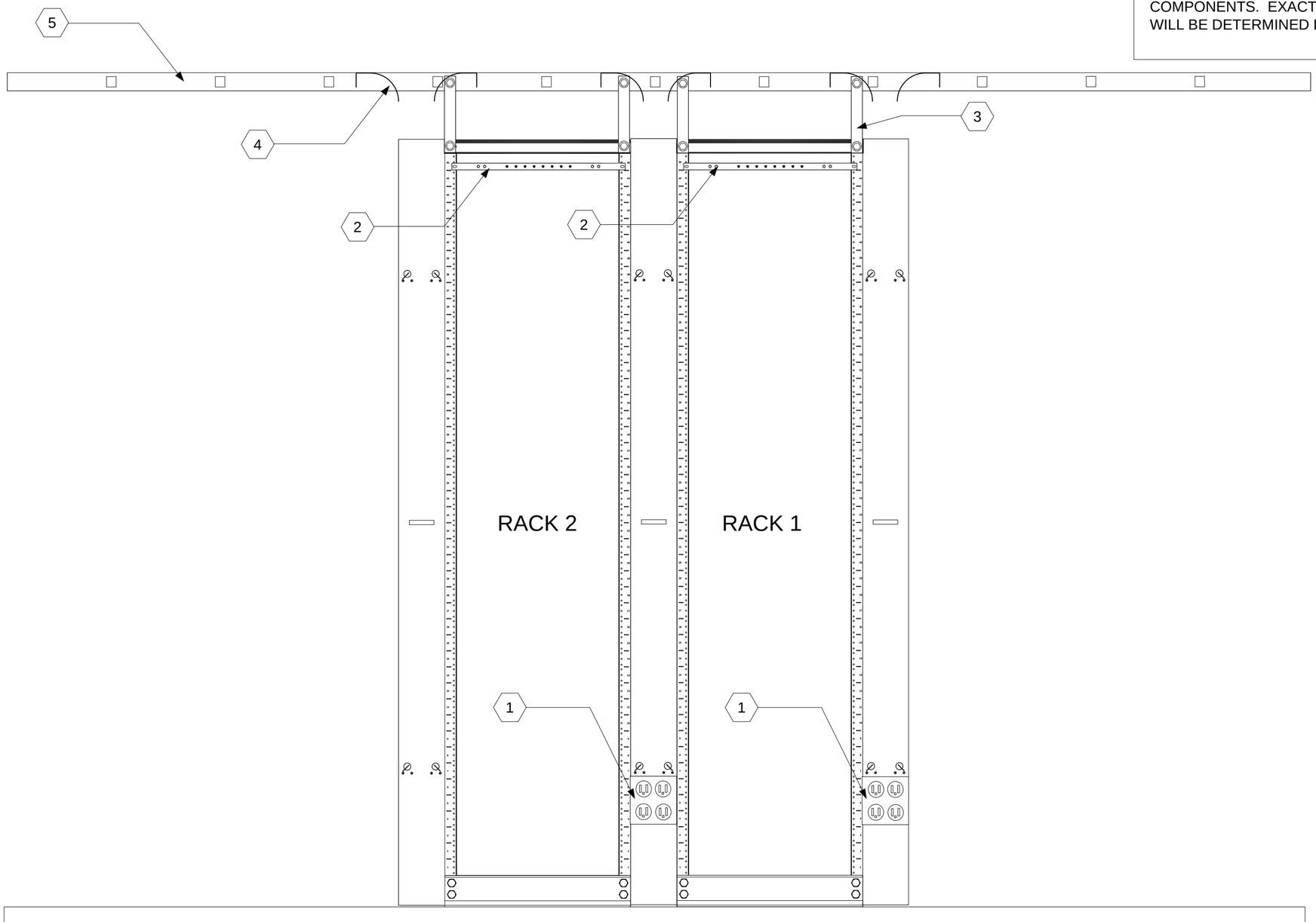
C.15

SHEET KEY NOTES

1. DOUBLE DUPLEX NEMA 5-20R RECEPTACLES (TYPICAL OF ALL SHOWN)
2. RBB
3. 6 INCH RACK ELEVATION KITS (TYPICAL OF ALL SHOWN)
4. RADIUS DROP OUT KITS (TYPICAL OF ALL SHOWN)
5. HORIZONTAL LADDER RACK

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.



TYPICAL TER RACK REAR ELEVATION DIAGRAM

ARMY RESERVE

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

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LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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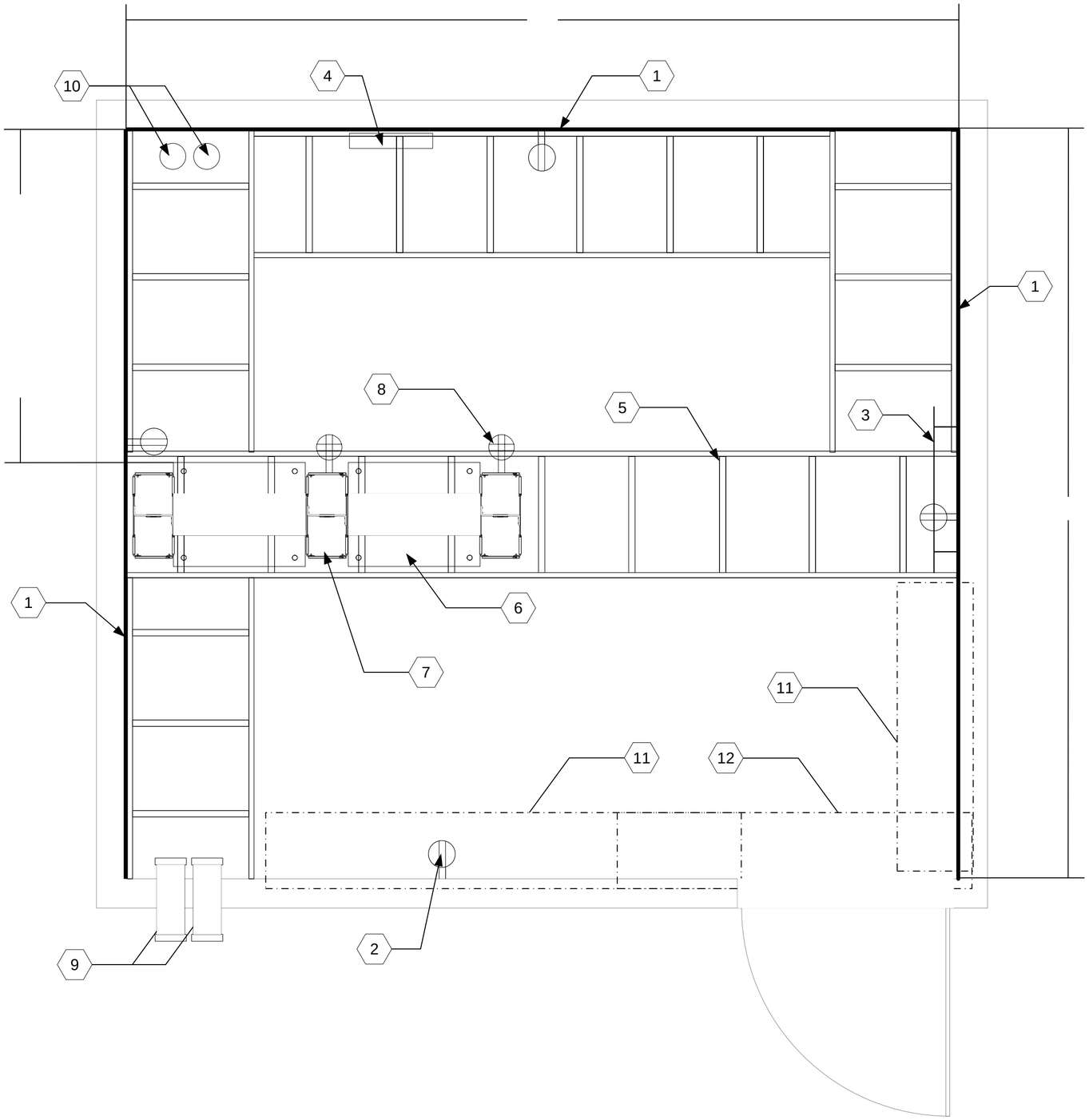
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

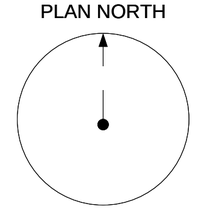
C.16



1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. NEMA 5-20 DUPLEX CONVENIENCE RECEPTACLE (TYPICAL OF ALL SHOWN)
3. SBB (LOCATE AS CLOSE AS PRACTICAL TO THE ELECTRICAL SUBPANEL WHILE REMAINING UNDERNEATH OF THE LADDER RACK)
4. 25 PAIR PRE-CONNECTORIZED 110 BLOCK FOR COPPER BACKBONE CABLE TERMINATION
5. HORIZONTAL LADDER RACK
6. TELECOMMUNICATIONS EQUIPMENT RACK (TYPICAL OF ALL SHOWN)
7. VERTICAL WIRE MANAGERS (TYPICAL OF ALL SHOWN)
8. EQUIPMENT RACK RECEPTACLES (TYPICAL OF ALL SHOWN)
9. STANDARD WALL SLEEVES OR SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING WALL SLEEVES (AS REQUIRED PER TECHNICAL CRITERIA)
10. SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING FLOOR SLEEVES TO TER/TR BELOW (IF APPLICABLE)
11. SPACE RESERVED FOR ELECTRICAL SUB PANEL AND OR ACCESS CONTROL PANEL (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)
12. SPACE RESERVED FOR HVAC EQUIPMENT (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

PLAN NORTH



TYPICAL TR AERIAL DIAGRAM

ARMY RESERVE

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPR.

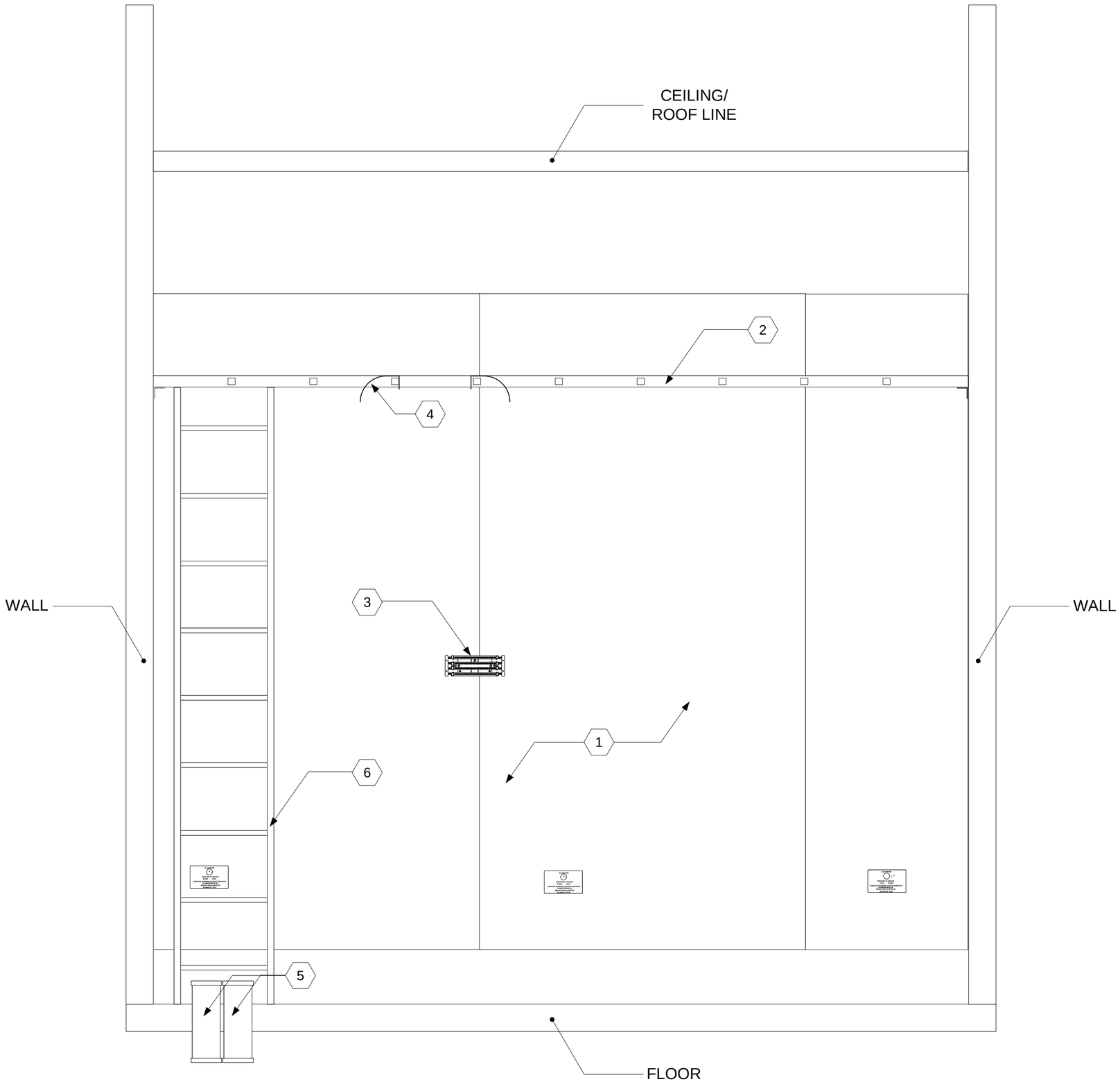
DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB
REVIEWED BY: ROBERT BABB
APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.17



SHEET KEY NOTES

1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. HORIZONTAL LADDER RACK
3. 25 PAIR PRE-CONNECTORIZED 110 BLOCK FOR COPPER BACKBONE CABLE TERMINATION
4. CABLE RADIUS DROP OUTS (WATERFALL SUPPORTS) TYPICAL OF ALL SHOWN
5. SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING FLOOR SLEEVES (IF APPLICABLE)
6. VERTICAL LADDER RACK

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

ARMY RESERVE

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

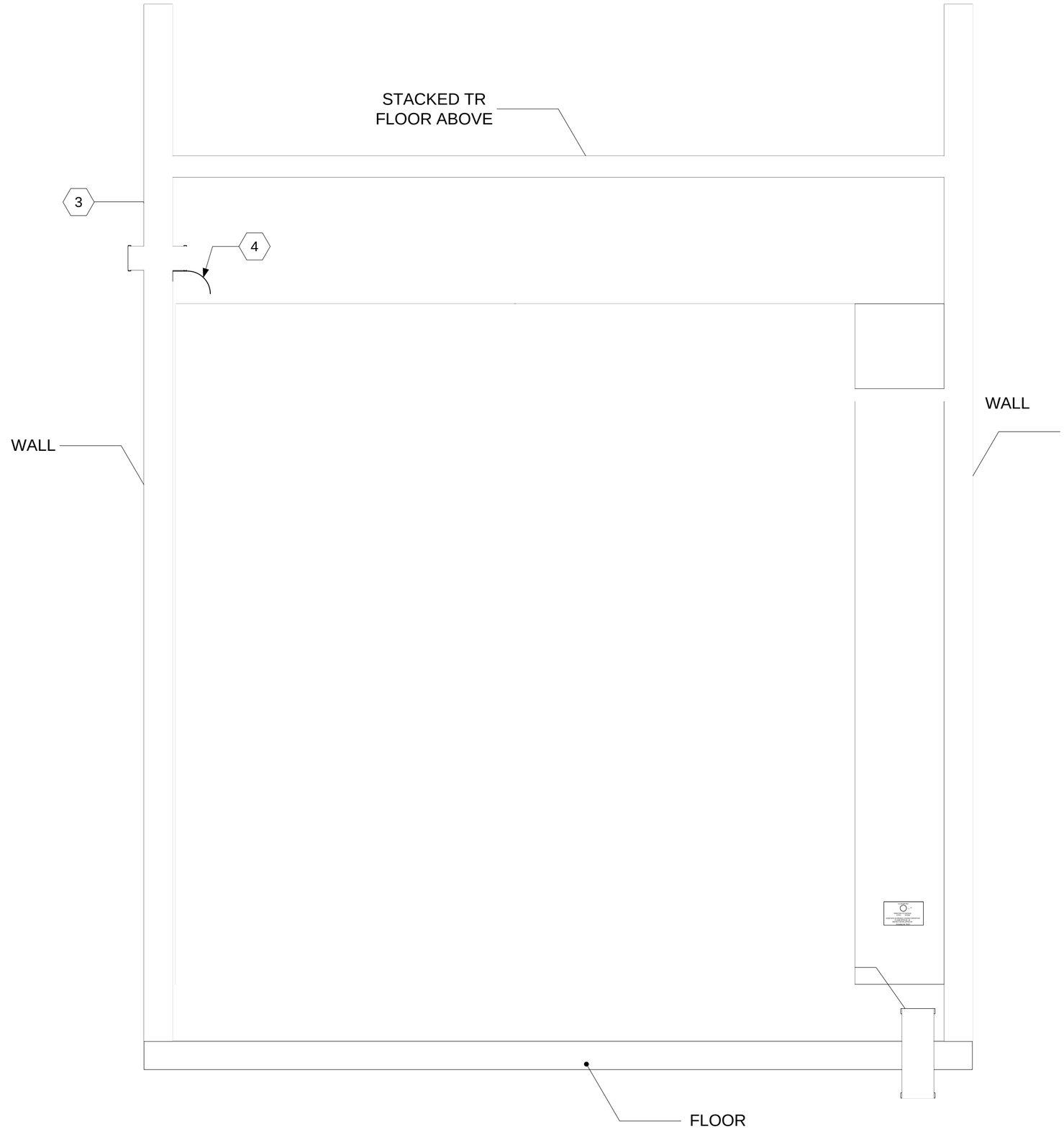
APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.18

TYPICAL TR WALL ELEVATION DIAGRAM (PLAN NORTH WALL)



1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. HORIZONTAL LADDER RACK
3. STANDARD WALL SLEEVES OR SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING WALL SLEEVES (AS REQUIRED PER TECHNICAL CRITERIA)
4. CABLE RADIUS DROP OUTS (WATERFALL SUPPORTS)
5. SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING FLOOR SLEEVES (IF APPLICABLE)

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

TYPICAL TER WALL ELEVATION DIAGRAM (PLAN WEST WALL)

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

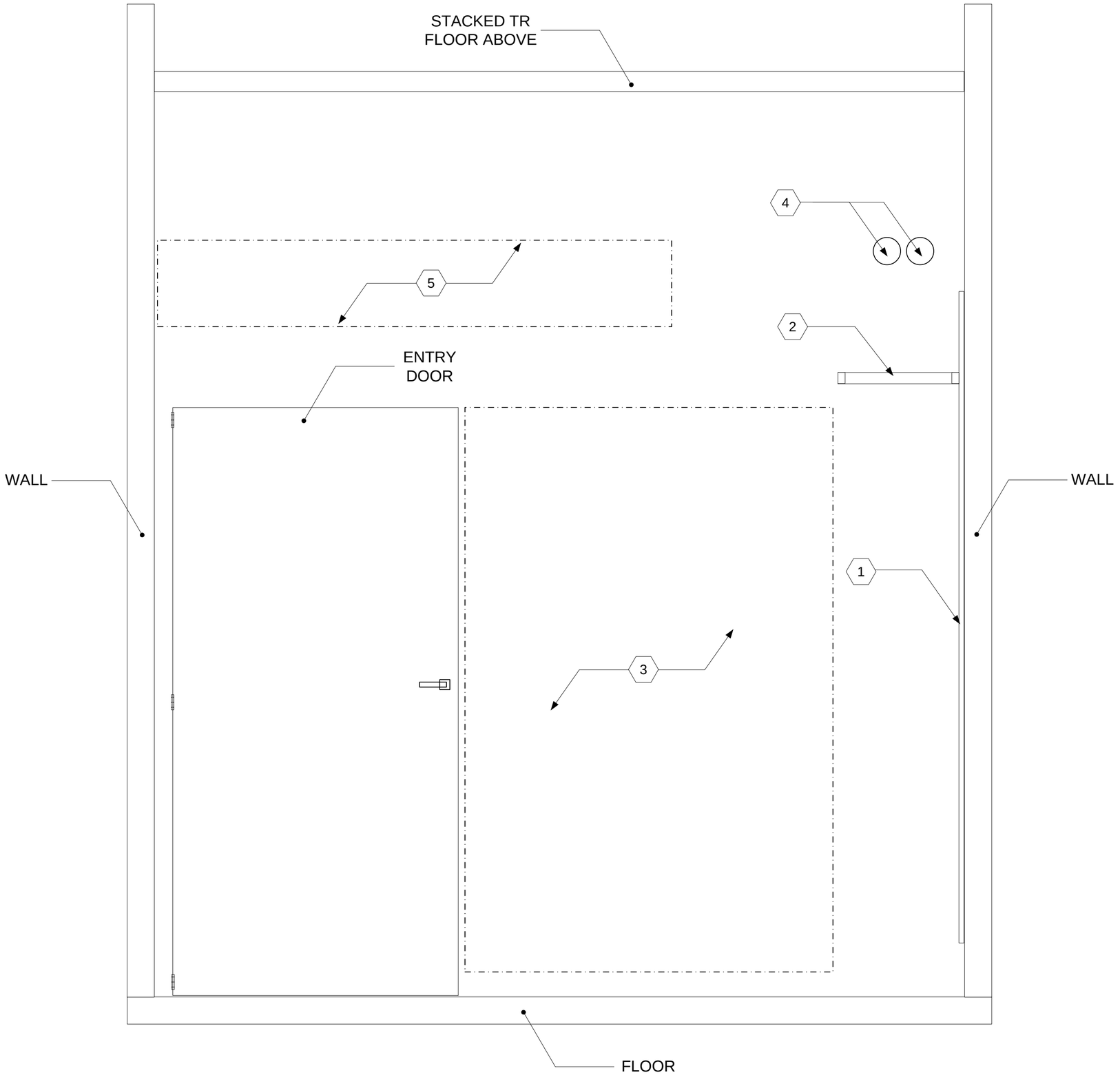
REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.19



SHEET KEY NOTES

1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. HORIZONTAL LADDER RACK
3. SPACE RESERVED FOR ELECTRICAL SUB PANEL, HVAC EQUIPMENT, ACCESS CONTROL PANEL (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)
4. STANDARD WALL SLEEVES OR SELF-SEALING, RE-ENTERABLE, MECHANICAL FIRE-STOPPING WALL SLEEVES (AS REQUIRED PER TECHNICAL CRITERIA)
5. SPACE RESERVED FOR HVAC EQUIPMENT (NO LADDER RACK CAN BE INSTALLED ABOVE OR BELOW THESE COMPONENTS)

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

TYPICAL TER WALL ELEVATION DIAGRAM (PLAN SOUTH WALL)

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
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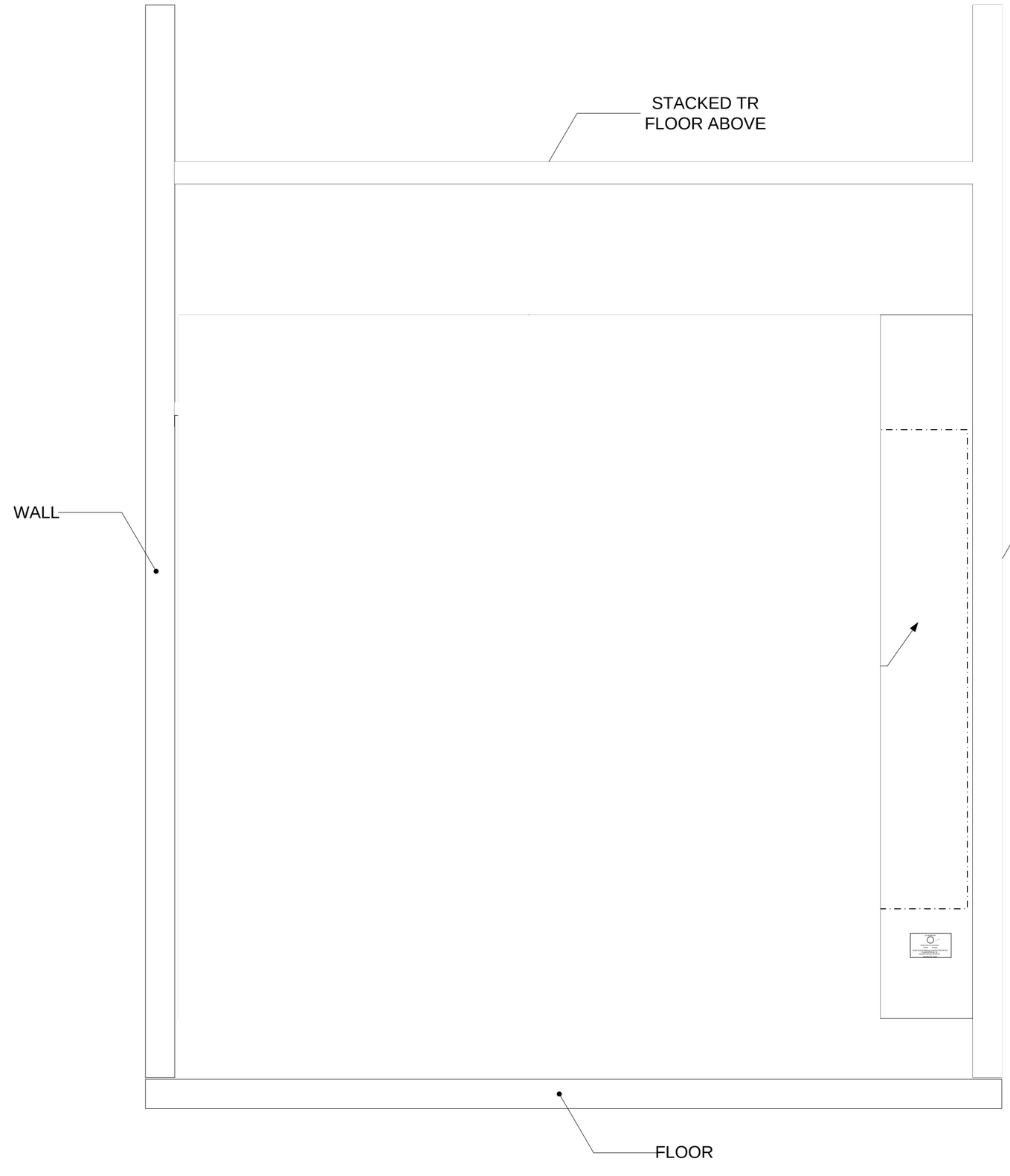
DIAGRAM AND DETAILS

C.20



1. PLYWOOD BACKBOARD (1 FIRE-RATED STAMP TO REMAIN VISIBLE ON EACH SHEET)
2. SBB
3. HORIZONTAL LADDER RACK
4. SPACE RESERVED FOR ELECTRICAL SUBPANEL (NO LADDER RACK CAN BE INSTALLED ABOVE ELECTRICAL SUBPANEL)

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

TYPICAL TER WALL ELEVATION DIAGRAM (PLAN EAST WALL)

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
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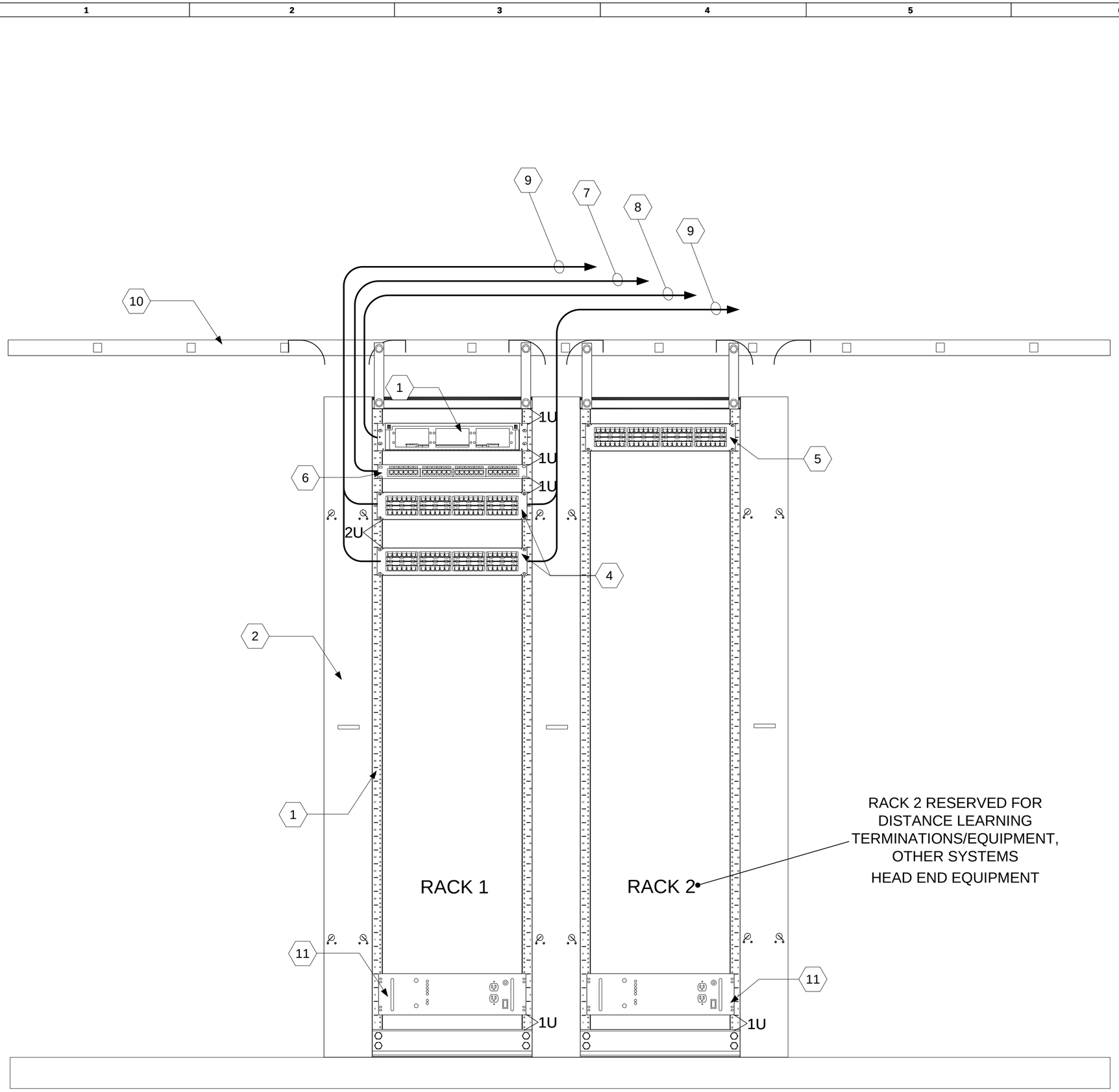
DIAGRAM AND DETAILS

C.21



SHEET KEY NOTES

1. 2 POST EQUIPMENT RACK (TYPICAL OF ALL SHOWN)
2. VERTICAL WIRE MANAGER (TYPICAL OF ALL SHOWN)
3. 2U FIBER PATCH PANEL
4. 48 PORT PATCH PANEL FOR CATEGORY 6A CABLES(TYPICAL OF ALL SHOWN)
5. 48 PORT PATCH PANEL FOR DISTANCE LEARNING CATEGORY 6A CABLES (IF APPLICABLE TO PROJECT)
6. 24 PORT 8P2C TELCO PATCH PANEL
7. 25 PAIR AMPHENOL COPPER BACKBONE CABLE TO WALL MOUNTED 110 BLOCK
8. ISP FOC TO TER
9. CATEGORY 6A HORIZONTAL CABLE
10. HORIZONTAL LADDER RACK
11. LCR2400 LINE CONDITIONER (GFGI)

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

TYPICAL TR RACK FRONT ELEVATION DIAGRAM

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
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TECHNICAL CRITERIA
DIAGRAM AND DETAILS

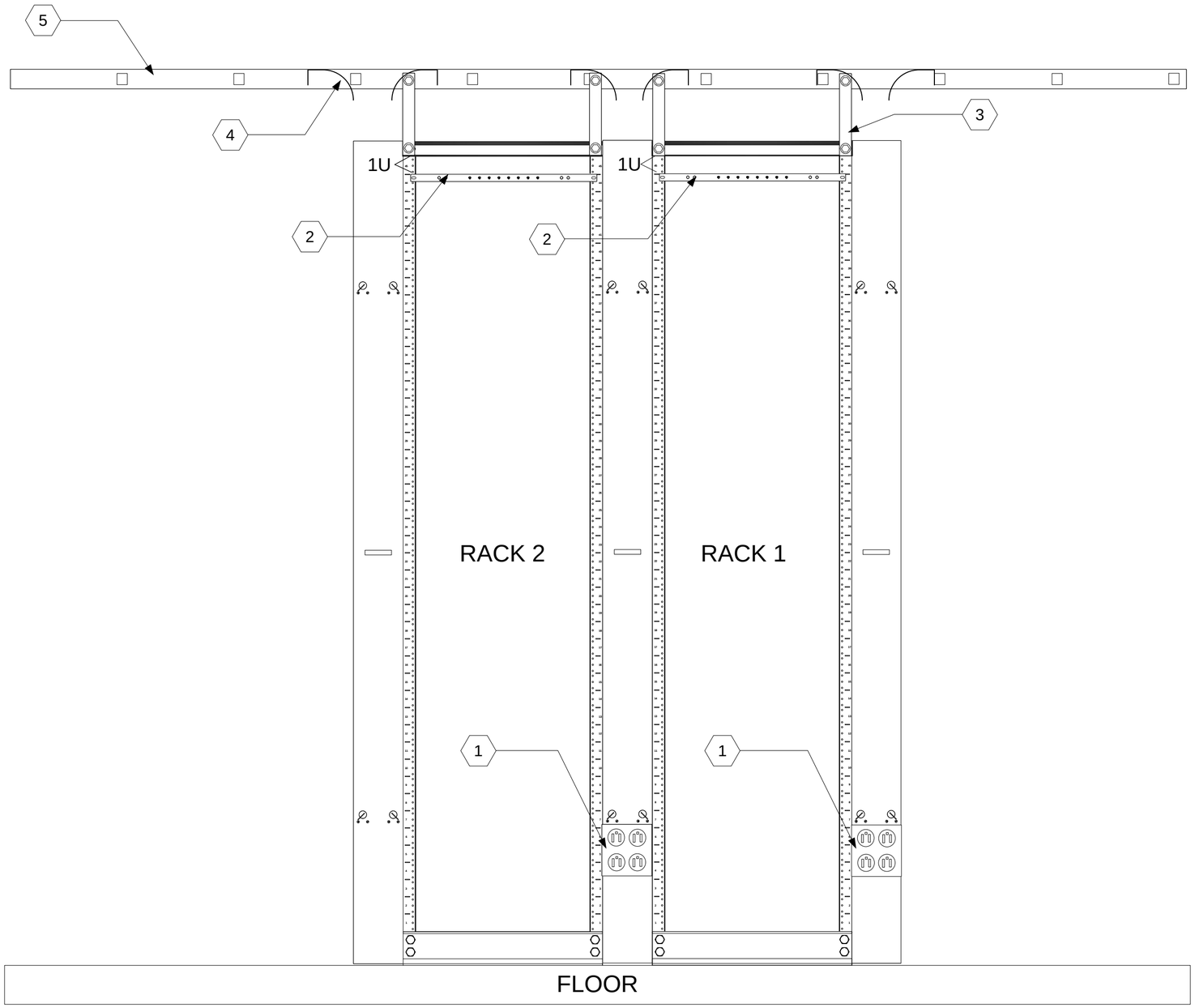
C.22

SHEET KEY NOTES

1. DOUBLE DUPLEX NEMA 5-20R RECEPTACLES (TYPICAL OF ALL SHOWN)
2. RBB
3. 6 INCH RACK ELEVATION KITS (TYPICAL OF ALL SHOWN)
4. RADIUS DROP OUT KITS (TYPICAL OF ALL SHOWN)
5. HORIZONTAL LADDER RACK

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.



TYPICAL STANDARD TR RACK REAR ELEVATION DIAGRAM

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

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REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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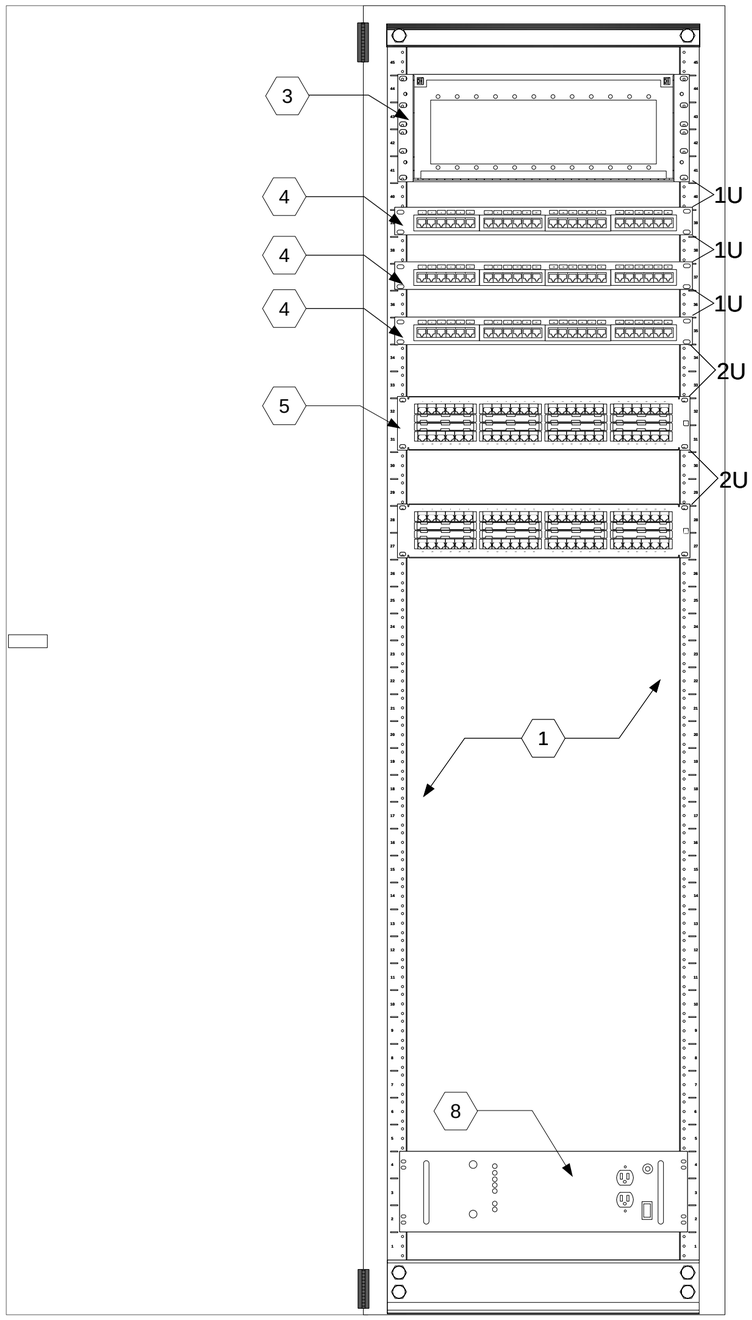
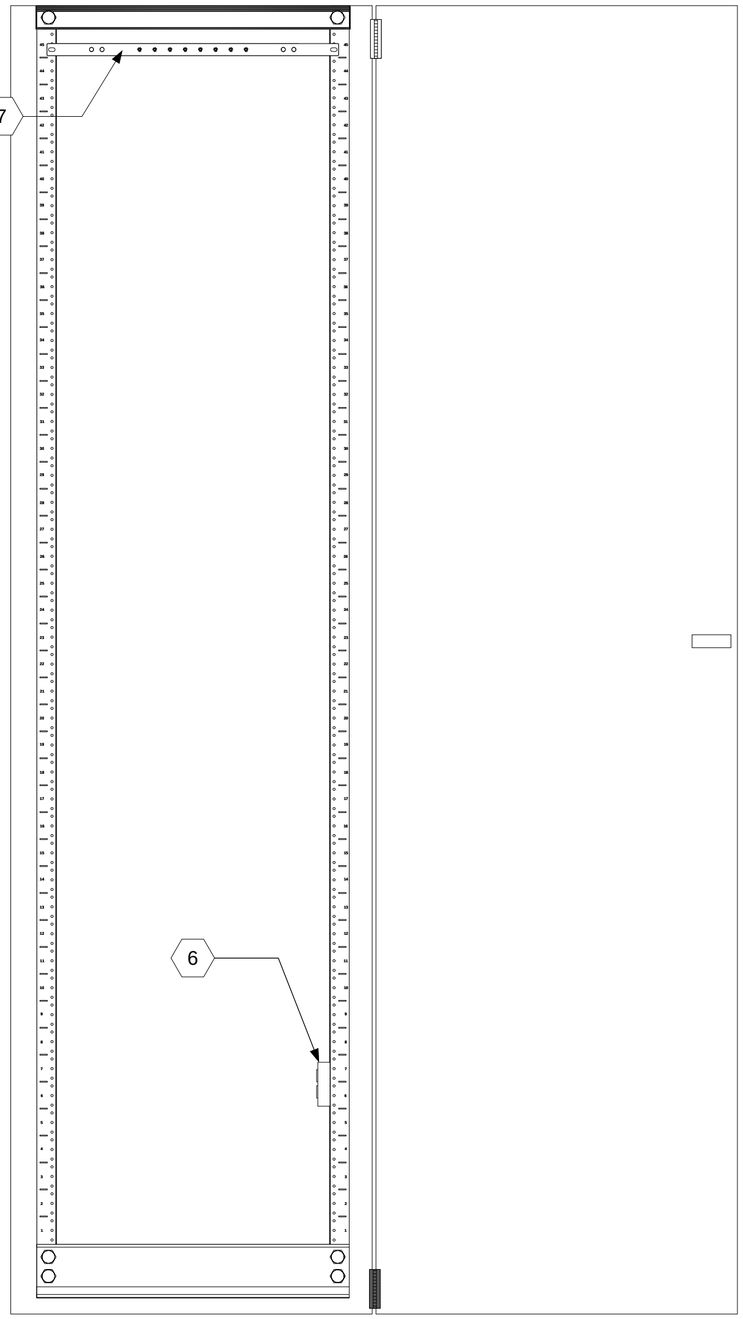
C.23



TELECOMMUNICATIONS CABINET FRONT VIEW



TELECOMMUNICATIONS CABINET REAR VIEW

SHEET KEY NOTES

1. TELECOMMUNICATIONS FLOOR MOUNTED CABINET
2. 2U HORIZONTAL WIRE MANAGEMENT
3. 4U FIBER PATCH PANEL
4. 24 PORT 8P2C TELCO PATCH PANEL
5. CATEGORY 6A PATCH PANEL (TYPICAL OF ALL SHOWN)
6. (1) DEDICATED DOUBLE DUPLEX NEMA 5-20R RECEPTACLES. MOUNT BOTTOM RECEPTACLE AT 12" AFF ON THE SIDE WITHIN THE CHANNEL OF THE CABINET
7. RBB
8. LCR2400 LINE CONDITIONER (GFGI)

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

TYPICAL TER FLOOR MOUNTED TELECOMMUNICATIONS CABINET DIAGRAM

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

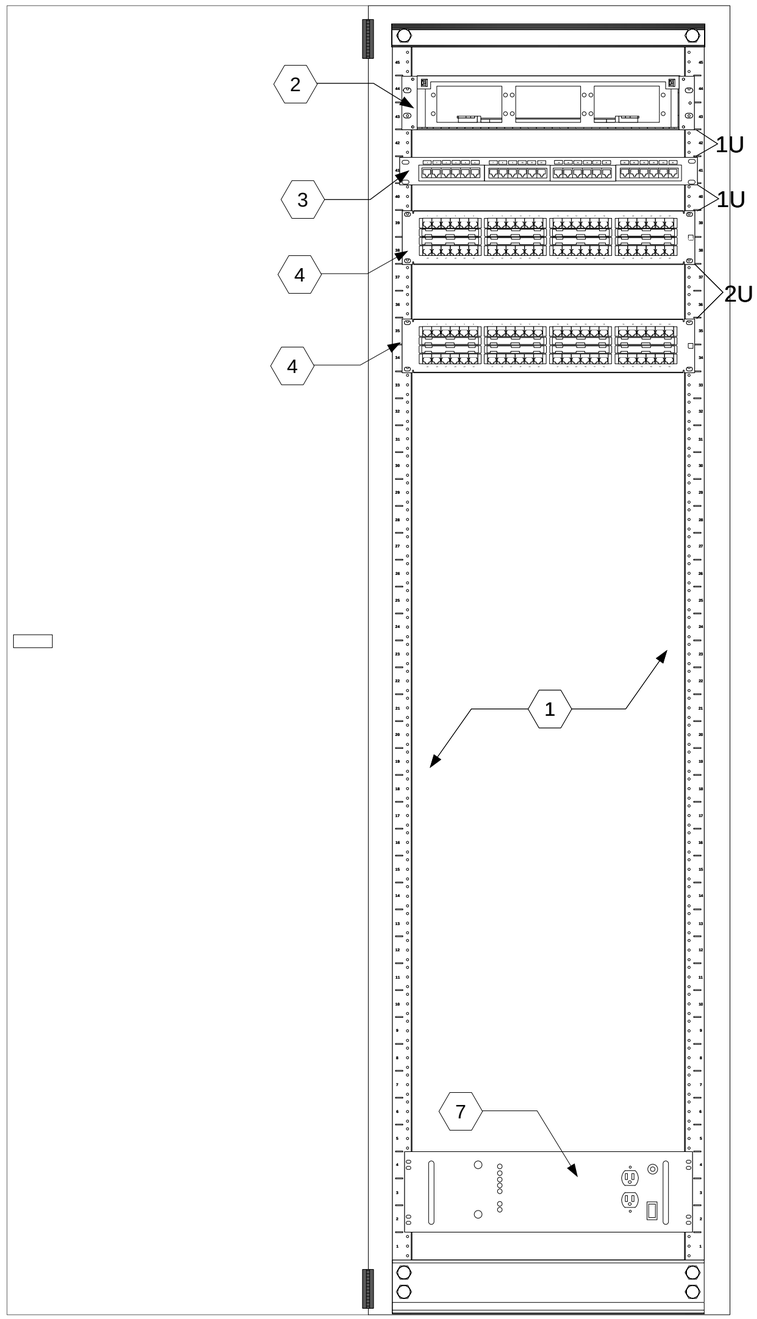
REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

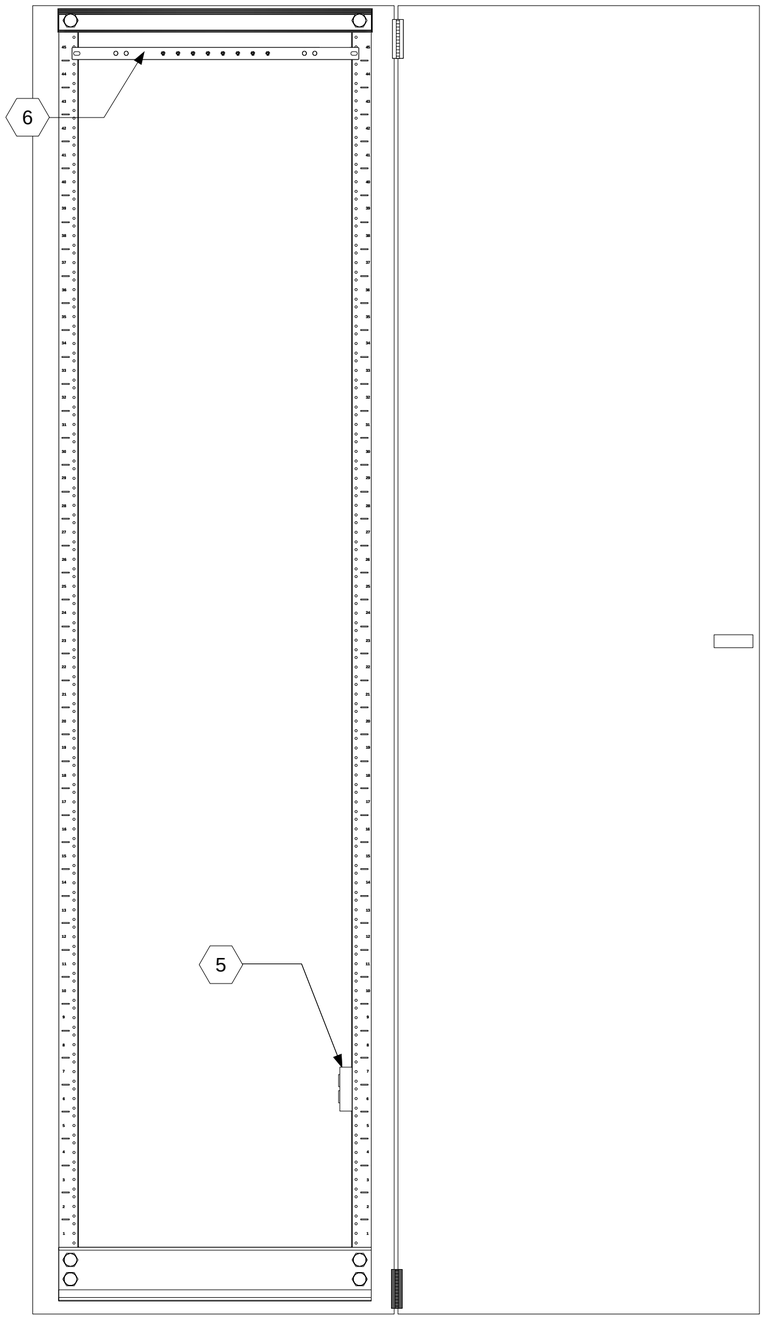
USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.24



TELECOMMUNICATIONS CABINET FRONT VIEW



TELECOMMUNICATIONS CABINET REAR VIEW

SHEET KEY NOTES

1. TELECOMMUNICATIONS FLOOR MOUNTED CABINET
2. 2U FIBER PATCH PANEL
3. 24 PORT 8P2C TELCO PATCH PANEL
4. CATEGORY 6A PATCH PANEL (TYPICAL OF ALL SHOWN)
5. (1) DEDICATED DOUBLE DUPLEX NEMA 5-20R RECEPTACLES. MOUNT BOTTOM RECEPTACLE AT 12" AFF ON THE SIDE WITHIN THE CHANNEL OF THE CABINET
6. RBB
7. LCR2400 LINE CONDITIONER (GFGI)

SHEET GENERAL NOTES

1. ALL DIAGRAMS ILLUSTRATE REQUIRED COMPONENTS. THE DIAGRAMS DO NOT NECESSARILY ILLUSTRATE THE QUANTITY REQUIRED OF EACH COMPONENT NOR THE ACTUAL LOCATION FOR THESE COMPONENTS. EXACT QUANTITY AND LOCATION WILL BE DETERMINED DURING THE DESIGN PROCESS.

TYPICAL TR FLOOR MOUNTED TELECOMMUNICATIONS CABINET DIAGRAM

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

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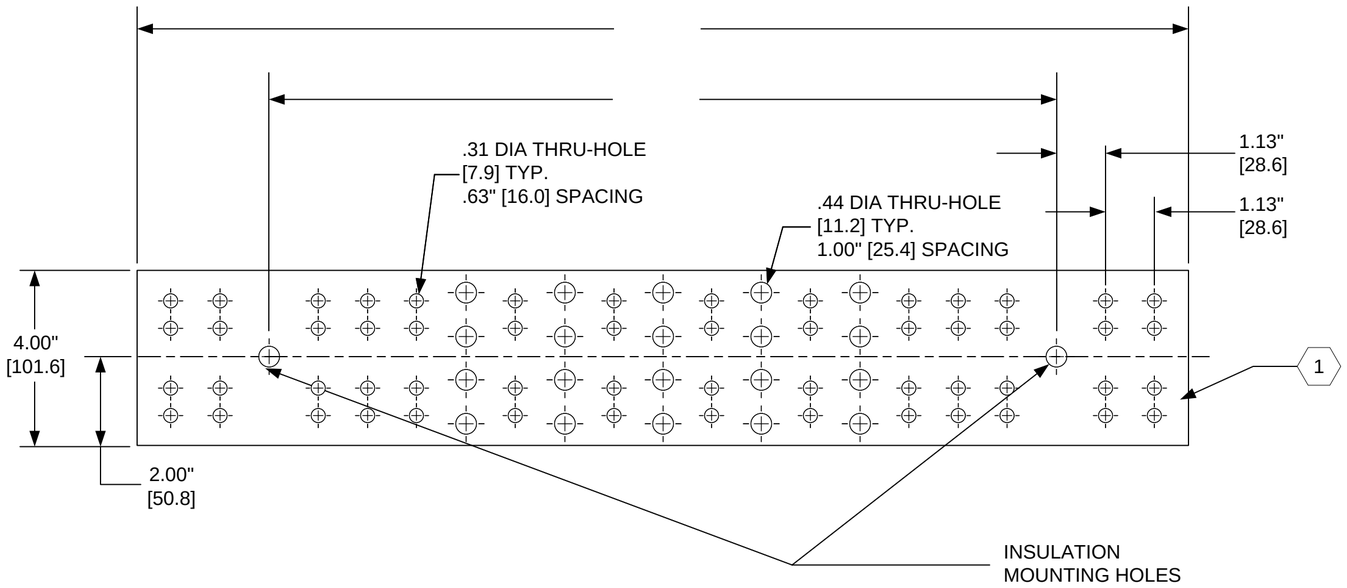
DIAGRAM AND DETAILS

C.25

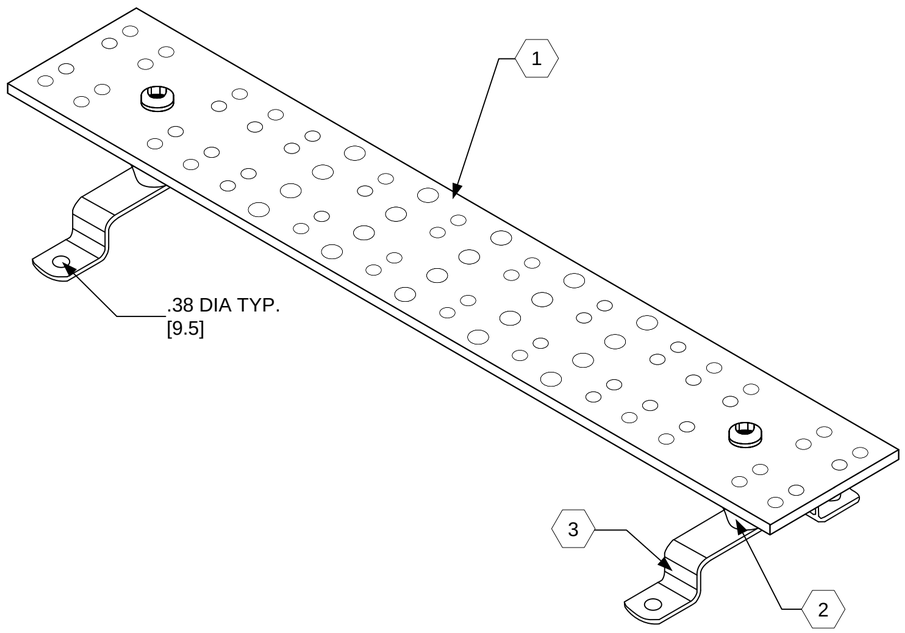
1 PBB

2 INSULATOR (TYPICAL OF ALL SHOWN)

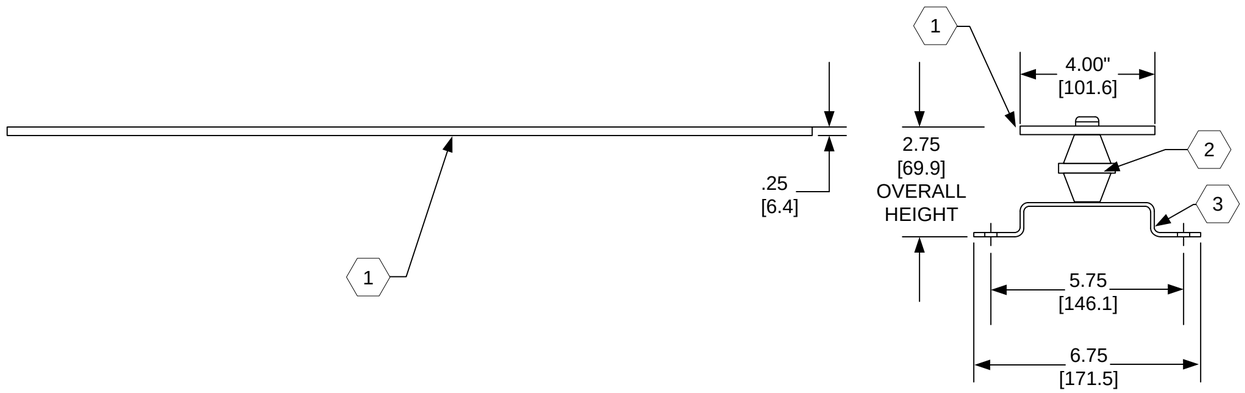
3 MOUNTING BRACKET (TYPICAL OF ALL SHOWN)



1 PBB FRONT VIEW DETAIL



2 PBB ISOMETRIC DETAIL



3 PBB SIDE VIEW DETAIL

TYPICAL TELECOMMUNICATION PRIMARY BUS BAR (PBB) ENLARGED DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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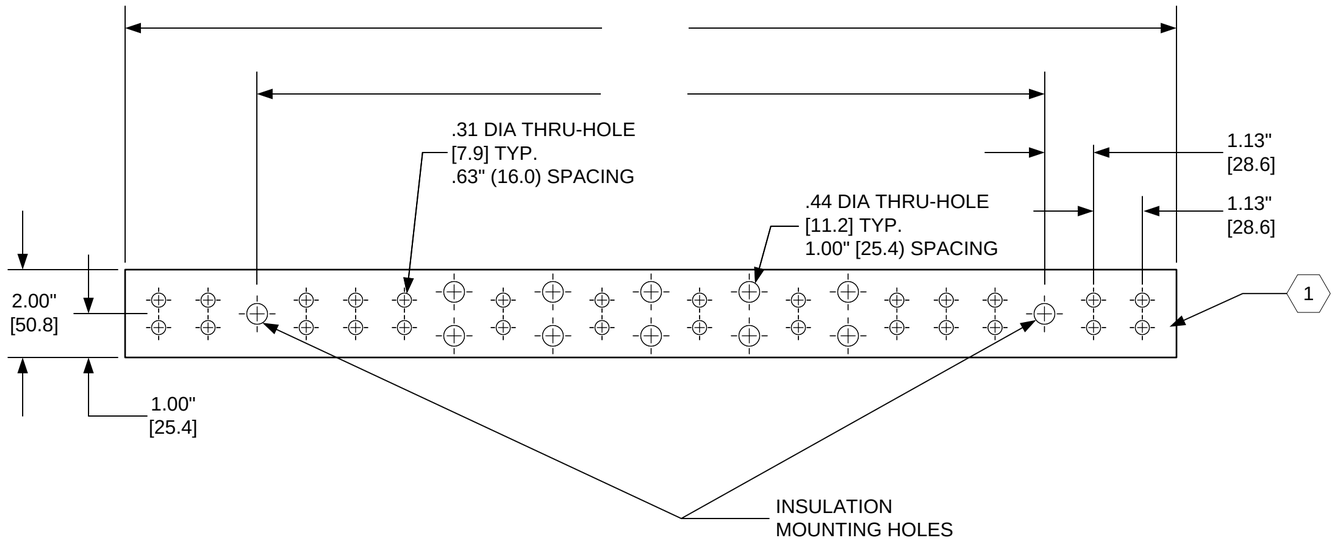
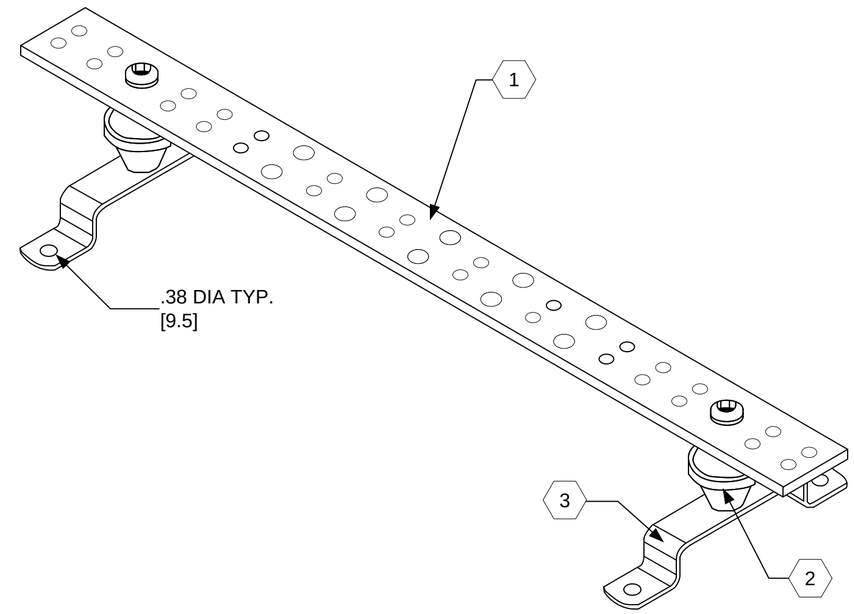
DIAGRAM AND DETAILS

C.26

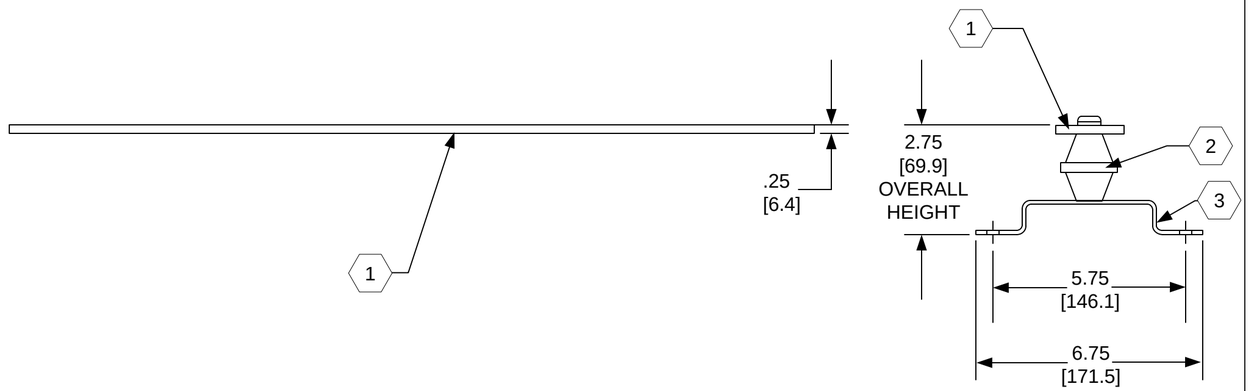
1	SBB
2	INSULATOR (TYPICAL OF ALL SHOWN)
3	MOUNTING BRACKET (TYPICAL OF ALL SHOWN)



1 SBB FRONT VIEW DETAIL



2 SBB ISOMETRIC DETAIL



3 SBB SIDE VIEW DETAIL

TYPICAL TELECOMMUNICATION SECONDARY BUS BAR (SBB) ENLARGED DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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NETWORK ENTERPRISE CENTER
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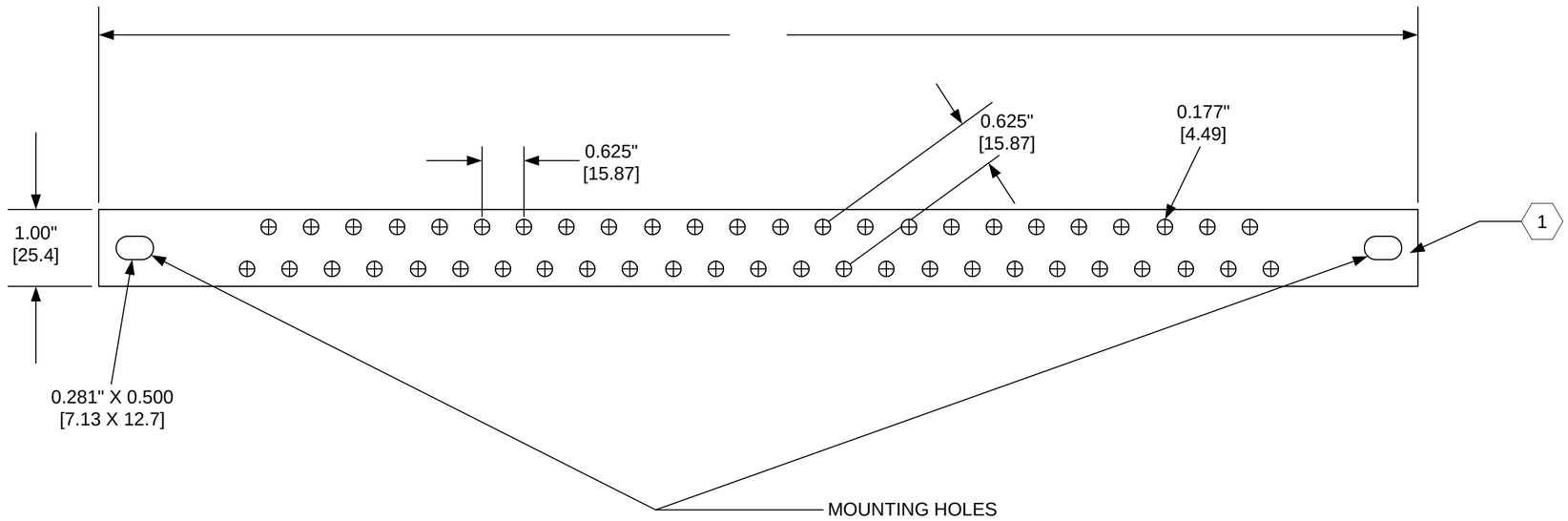
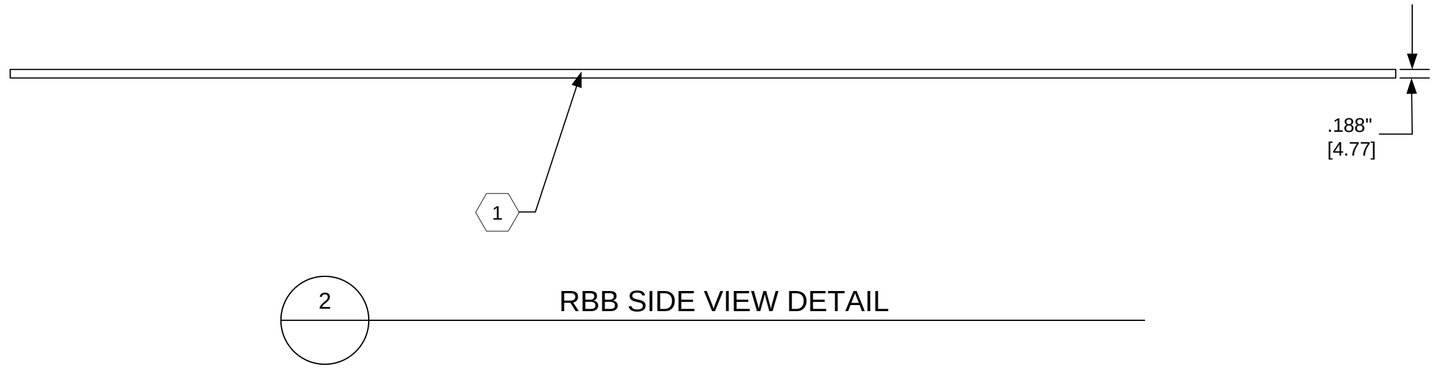
DIAGRAM AND DETAILS

C.27

1 RBB



1 RBB FRONT VIEW DETAIL



2 RBB SIDE VIEW DETAIL

TYPICAL TELECOMMUNICATION RACK BUS BAR (RBB) ENLARGED DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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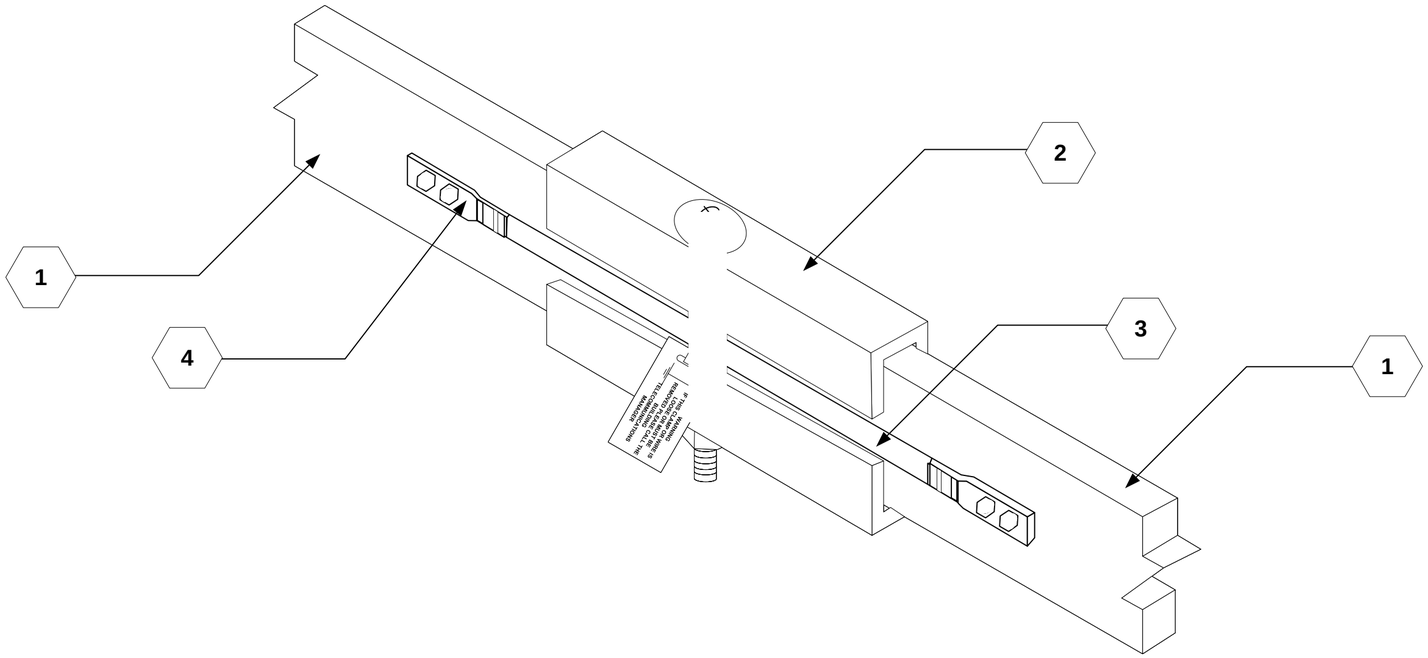
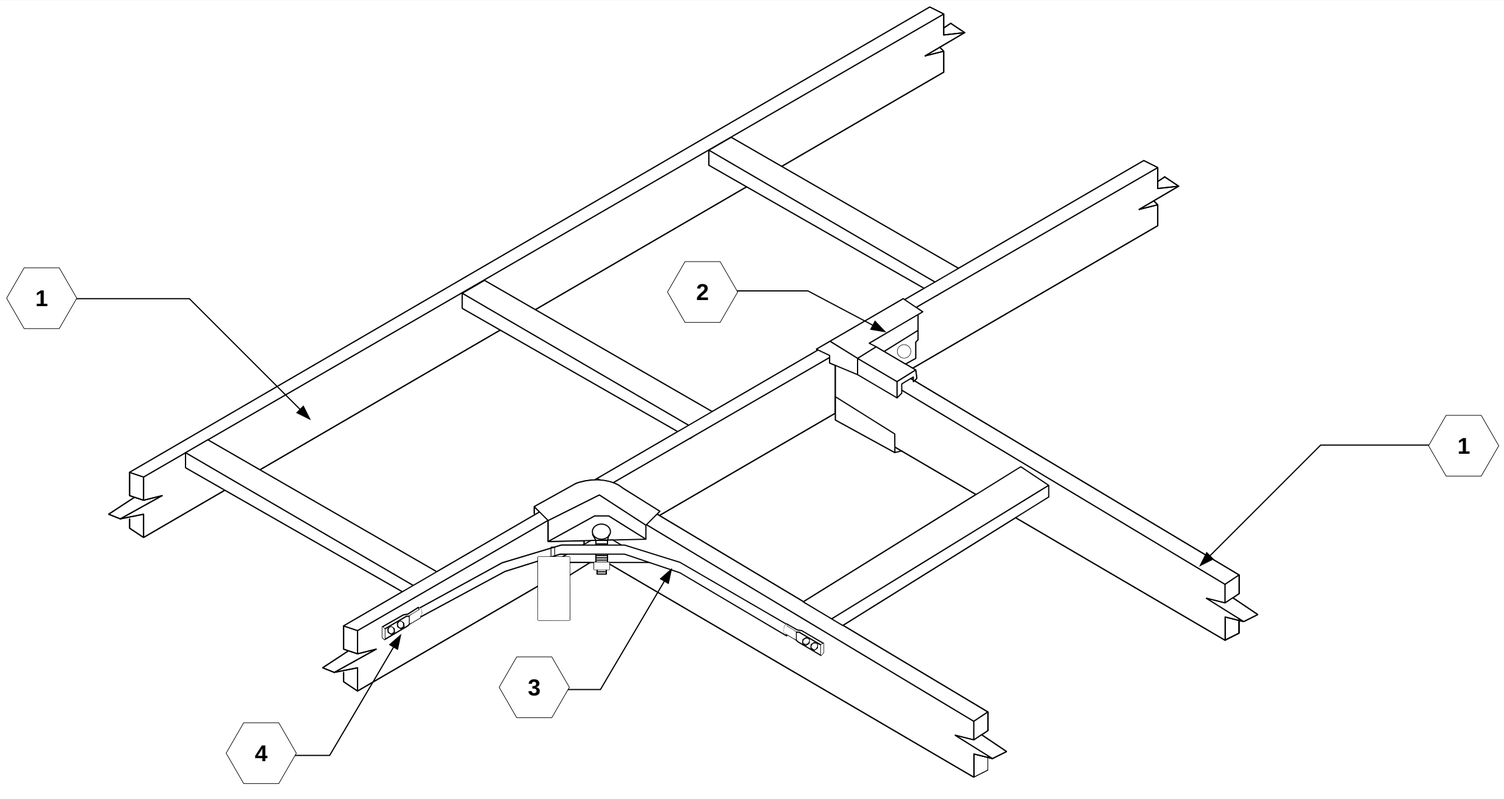
U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.28



1 LADDER RACK GROUNDING STRAP ENLARGED DETAIL

1. LADDER RACK SUPPORT SYSTEM SECTION
2. LADDER RACK SUPPORT SYSTEM SECTION CONNECTOR
3. BONDING CONDUCTOR
4. BONDING CONNECTOR WITH INSPECTION WINDOW



2 LADDER RACK GROUNDING STRAP ENLARGED DETAIL

TYPICAL LADDER RACK GROUNDING DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB
REVIEWED BY: ROBERT BABB
APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

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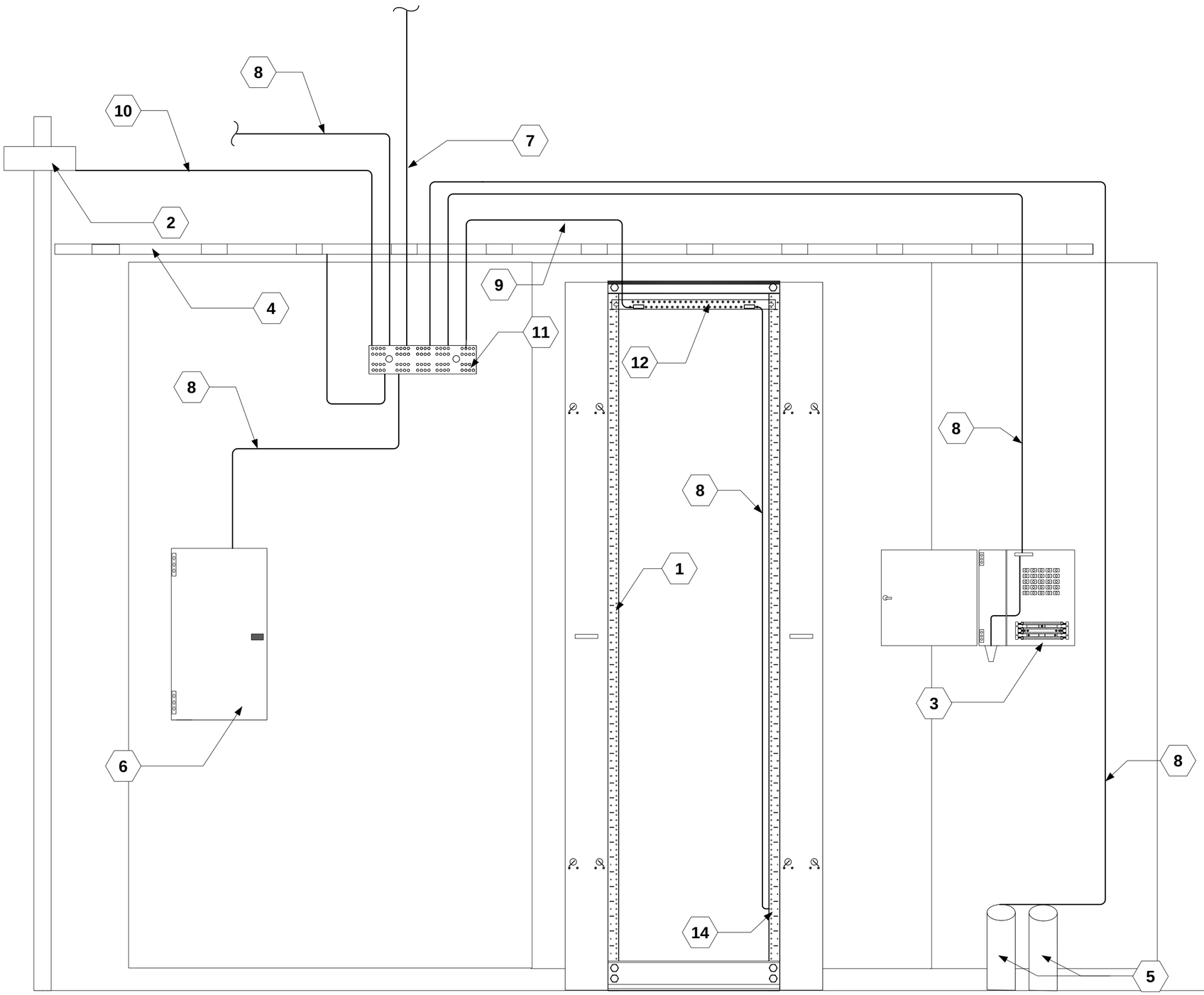

SHEET KEY NOTES

1. TELECOMMUNICATIONS RACKS / TELECOMMUNICATIONS CABINETS
2. WALL/FLOOR/CEILING SLEEVE/MECHANICAL FIRE STOP/OVERHEAD METALLIC CONDUIT
3. PROTECTOR ENTRANCE TERMINAL (PET)
4. LADDER RACK SUPPORT SYSTEM
5. METALLIC CONDUITS
6. ELECTRICAL SUBPANEL
7. BONDING CONDUCTOR TO BUILDING STEEL
8. TYPICAL METALLIC COMPONENT BONDING CONDUCTOR
9. RBC
10. TBB TO PBB (IF APPLICABLE)
11. PBB/SBB
12. RBB
13. TEBC
14. RACK INTEGRAL BONDING LUG CONNECTION

TYPICAL BONDING RISER DIAGRAM

ARMY RESERVE

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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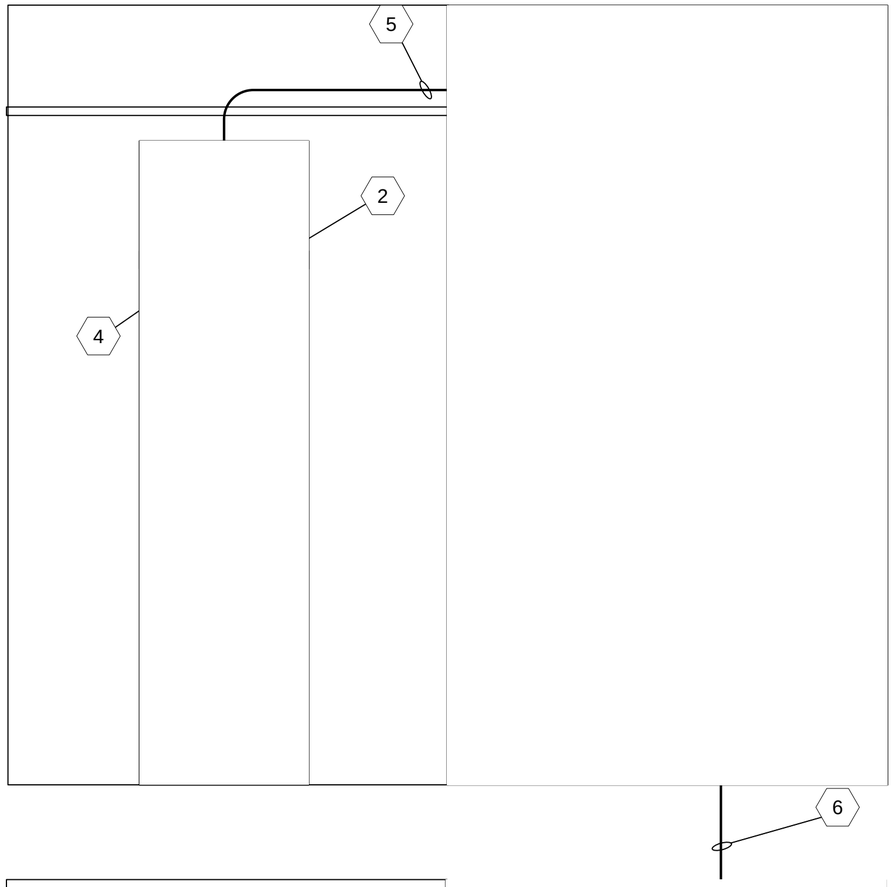
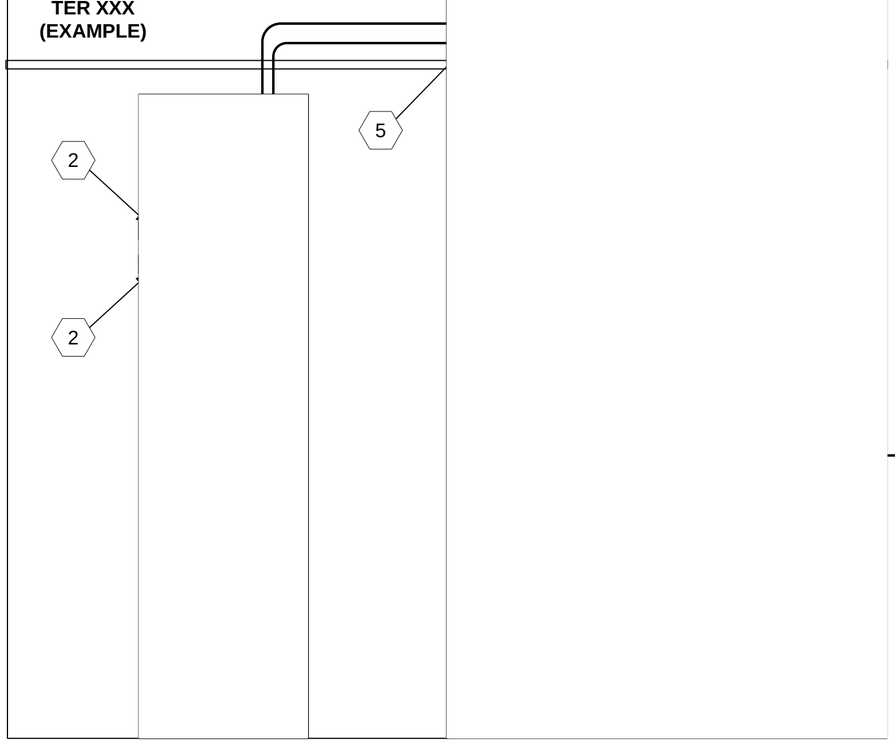
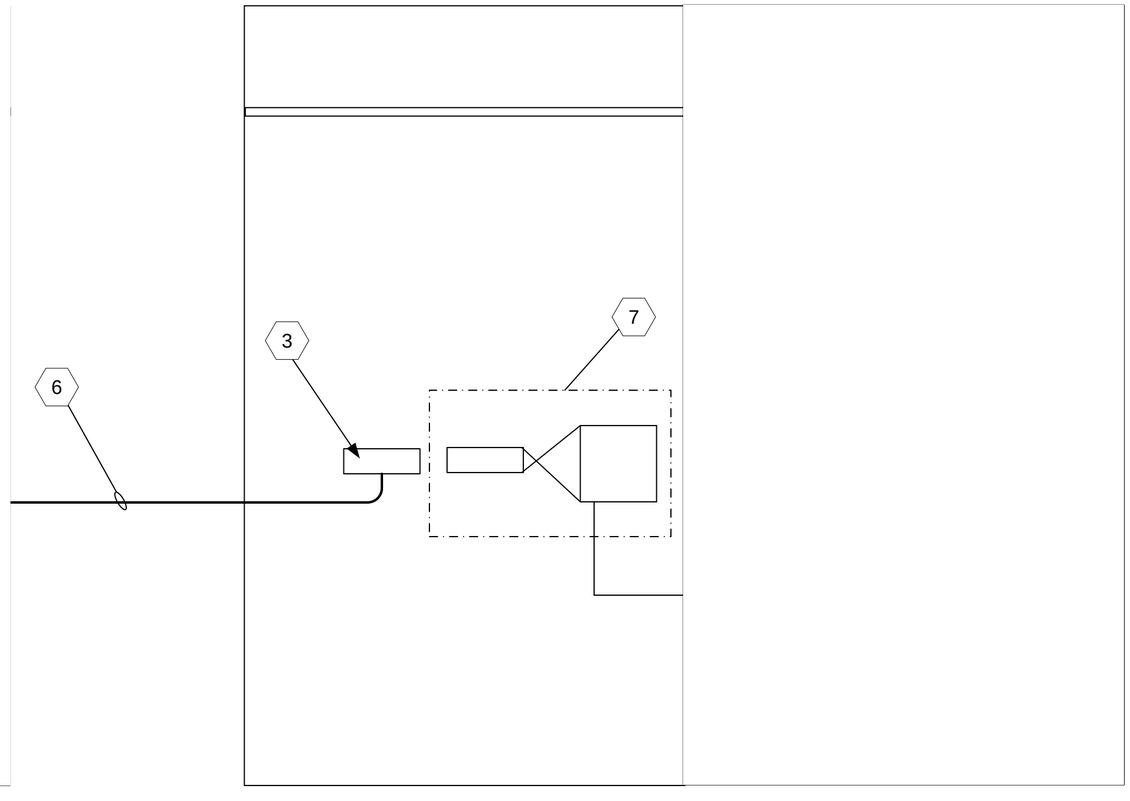
DIAGRAM AND DETAILS

C.30







1. WALL MOUNTED 25 PAIR PRE-CONNECTORIZED 110 BLOCK
2. RACK MOUNTED 24 PORT PATCH 8P2C TELCO PATCH PANEL
3. WALL MOUNTED STANDARD 110 BLOCK
4. AMPHENOL CABLE CONNECTION
5. 25 PAIR AMPHENOL CABLE
6. 25 PAIR ISP BACKBONE COPPER CABLE
7. SERVICE PROVIDER COPPER BACKBONE TERMINATION COMPONENTS (PROVIDED AND INSTALLED BY SERVICE PROVIDER)
8. SERVICE PROVIDER COPPER BACKBONE CABLE (PROVIDED AND INSTALLED BY SERVICE PROVIDER)
9. TYPICAL TELECOMMNUNICTAIONS EQUIPMENT RACK

1. THIS DIAGRAM IS MEANT TO SHOW THE LOGICAL RELATIONSHIP BETWEEN BACKBONE COPPER TERMINATION COMPONENTS. IT IS NOT MEANT TO SHOW THE EXACT LOCATION OF THE COMPONENTS WITHIN THE TELECOMMUNICATIONS SPACE.

25 PAIR COPPER BACKBONE INTRA-BUILDING TERMINATION RISER DIAGRAM

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

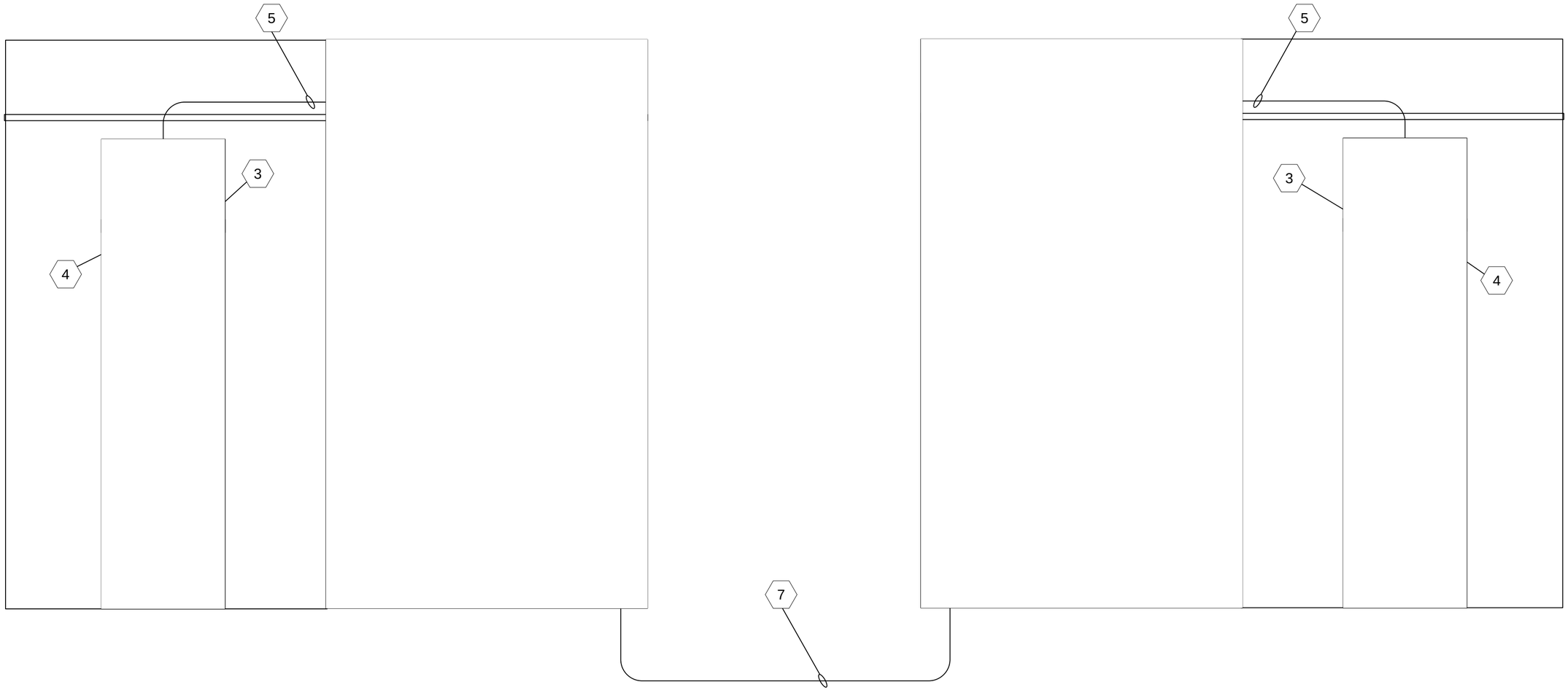
USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.31

1. WALL MOUNTED BET
2. WALL MOUNTED 25 PAIR PRE-CONNECTORIZED 110 BLOCK
3. RACK MOUNTED 24 PORT PATCH 8P2C TELCO PATCH PANEL
4. AMPHENOL CABLE CONNECTION
5. 25 PAIR AMPHENOL CABLE
6. 25 PAIR CROSS CONNECT CABLE
7. 25 PAIR OSP BACKBONE COPPER CABLE
8. TYPICAL TELECOMMNUNICTAIONS EQUIPMENT RACK

1. THIS DIAGRAM IS MEANT TO SHOW THE LOGICAL RELATIONSHIP BETWEEN BACKBONE COPPER TERMINATION COMPONENTS. IT IS NOT MEANT TO SHOW THE EXACT LOCATION OF THE COMPONENTS WITHIN THE TELECOMMUNICATIONS SPACE.



25 PAIR COPPER BACKBONE INTER-BUILDING TERMINATION RISER DIAGRAM

ARMY RESERVE

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

Distribution authorized to U.S. Government agencies and their contractors, for administrative and operational use.

LEAD DESIGNER: JOHN BABB

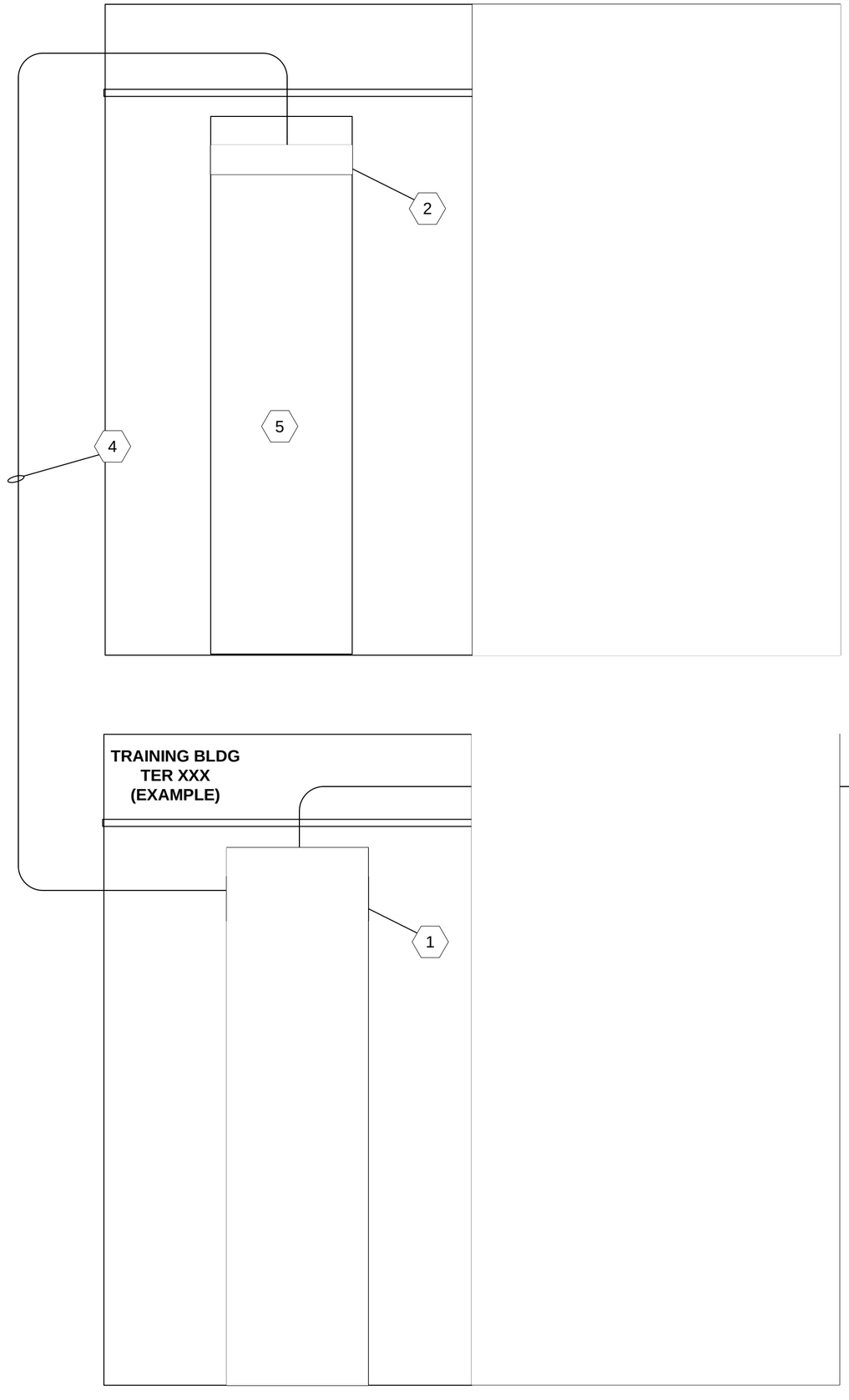
REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.32



1. 4RU RACK MOUNTED FOC PATCH PANEL
2. 2RU RACK MOUNTED FOC PATCH PANEL
3. WALL MOUNTED FOC PATCH PANEL
4. 24 STRAND ISP SM/OS2 FOC BACKBONE CABLE
5. TYPICAL TELECOMMNUNICTAIONS EQUIPMENT RACK
6. SERVICE PROVIDER BACKBONE FOC PATCH PANEL (PROVIDED AND INSTALLED BY SERVICE PROVIDER)
7. SERVICE PROVIDER BACKBONE FOC (PROVIDED AND INSTALLED BY SERVICE PROVIDER)

1. THIS DIAGRAM IS MEANT TO SHOW THE LOGICAL RELATIONSHIP BETWEEN FIBER OPTIC BACKBONE CABLE TERMINATION COMPONENTS. IT IS NOT MEANT TO SHOW THE EXACT LOCATION OF THE COMPONENTS WITHIN THE TELECOMMUNICATIONS SPACE.

FIBER OPTIC BACKBONE CABLE INTRA-BUILDING TERMINATION RISER DIAGRAM

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

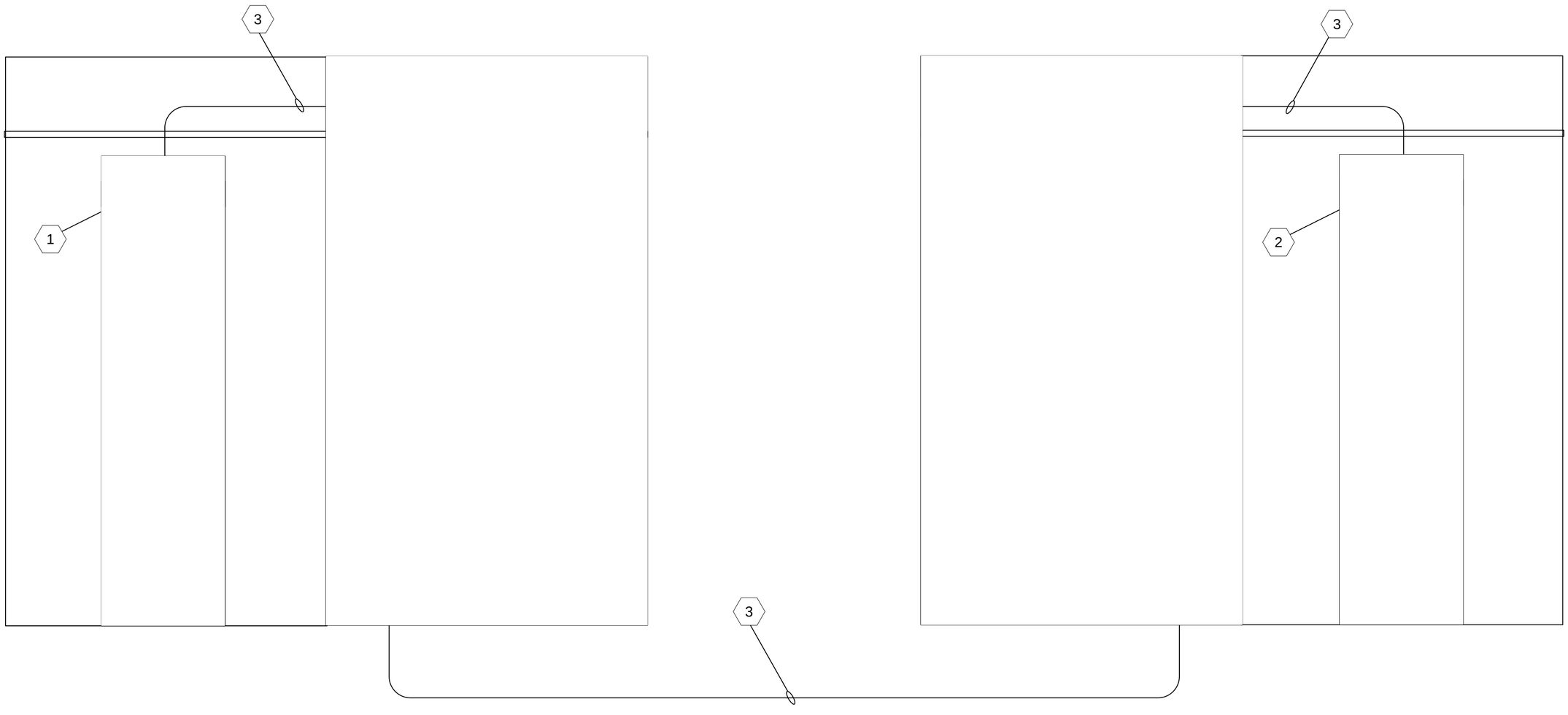
USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.33

1. 4RU FOC PATCH PANEL
2. 2RU FOC PATCH PANEL
3. SM/OS2 FOC BACKBONE CABLE
4. TYPICAL TELECOMMNUNICATIONS EQUIPMENT RACK

1. THIS DIAGRAM IS MEANT TO SHOW THE LOGICAL RELATIONSHIP BETWEEN BACKBONE FIBER TERMINATION COMPONENTS. IT IS NOT MEANT TO SHOW THE EXACT LOCATION OF THE COMPONENTS WITHIN THE TELECOMMUNICATIONS SPACE.



FIBER OPTIC BACKBONE CABLE INTER-BUILDING TERMINATION RISER DIAGRAM

ARMY RESERVE

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

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LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

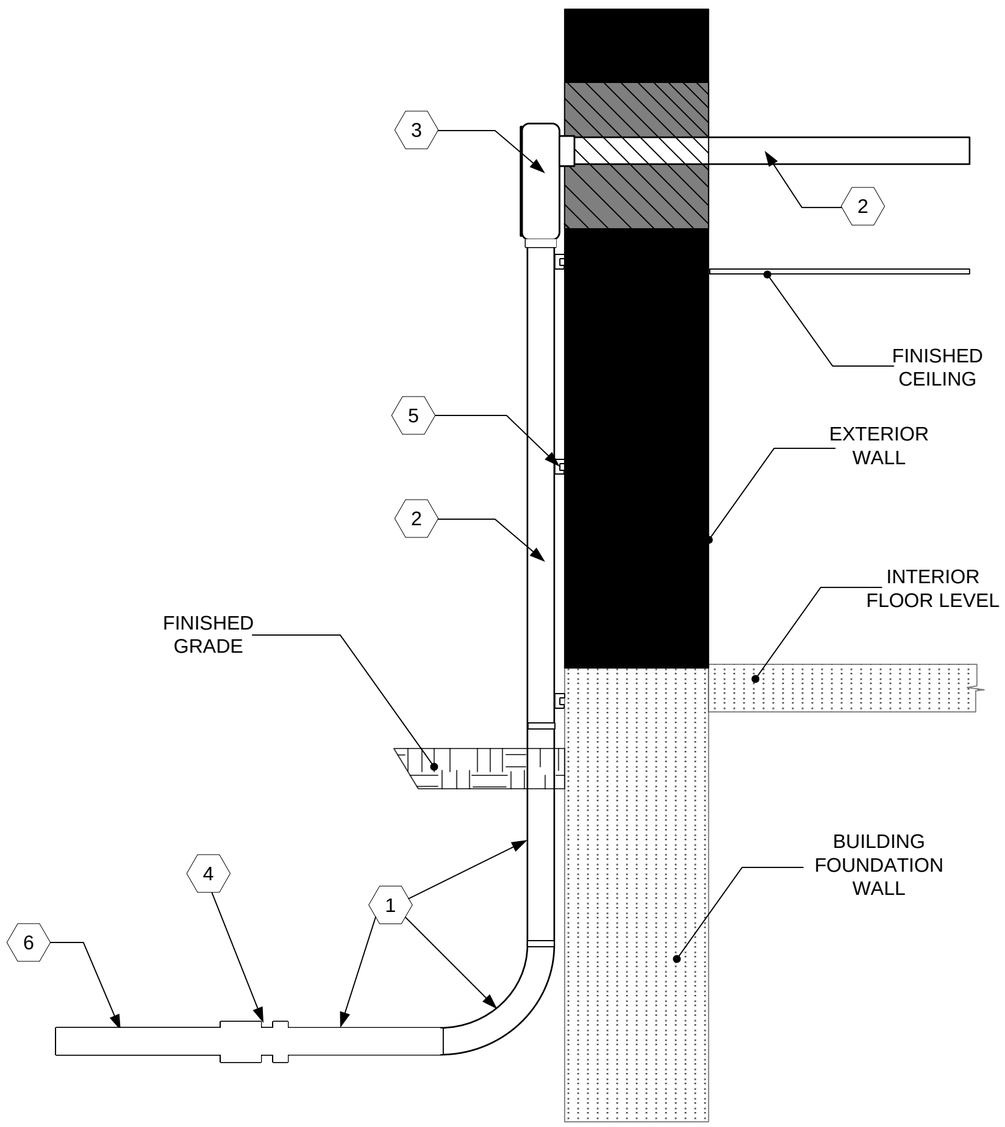
USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

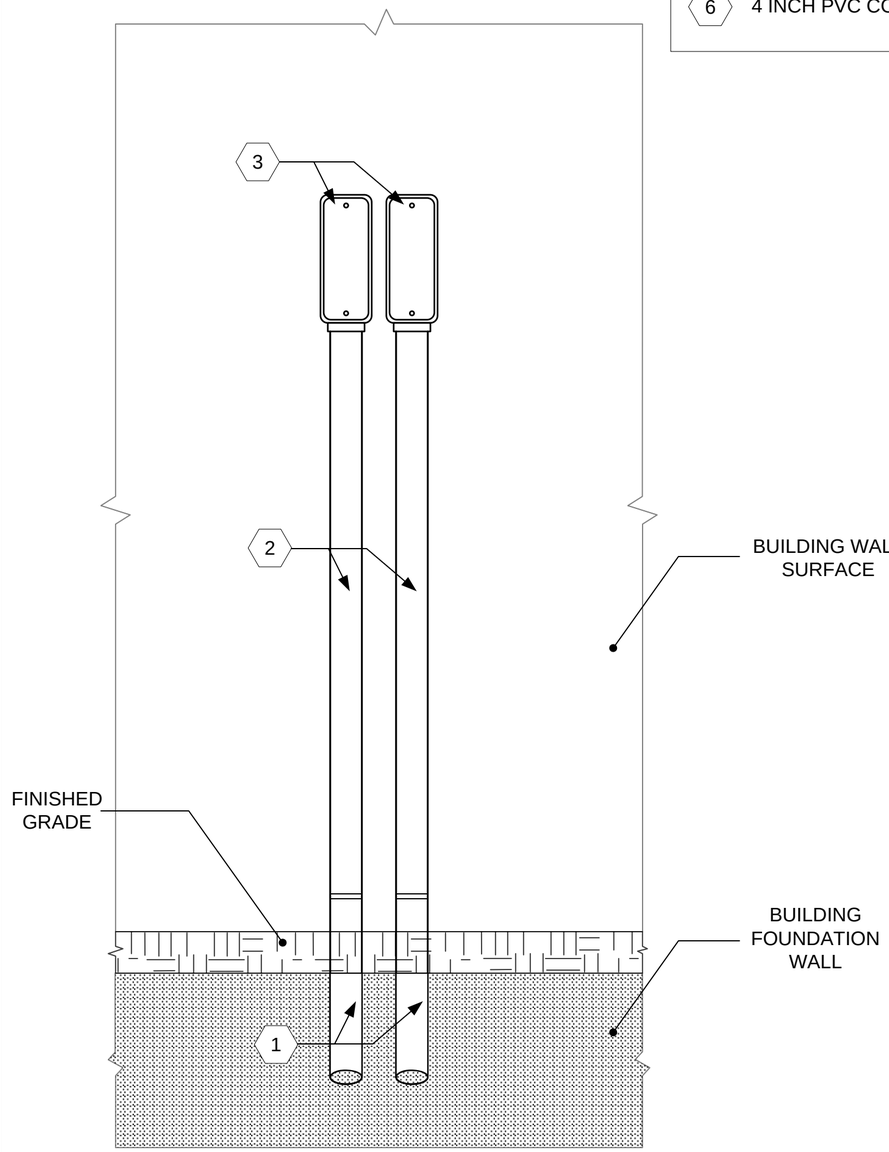
C.34

SHEET KEY NOTES

1. 4 INCH PVC COATED RGS. REQUIRED AT THE BEGINNING OF THE SWEEP AND UNTIL THE CONDUIT HAS BEEN SWEPT UP OUT OF THE EARTH
2. 4 INCH RMC/IMC
3. LB CONDUIT BODY
4. PVC TO RGS COUPLING
5. CONDUIT SUPPORTS (TYPICAL OF ALL SHOWN)
6. 4 INCH PVC CONDUIT



1 EXTERIOR BUILDING PENETRATION SIDE VIEW



2 EXTERIOR BUILDING PENETRATION FRONT VIEW

TYPICAL EXTERIOR BUILDING PENETRATION DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

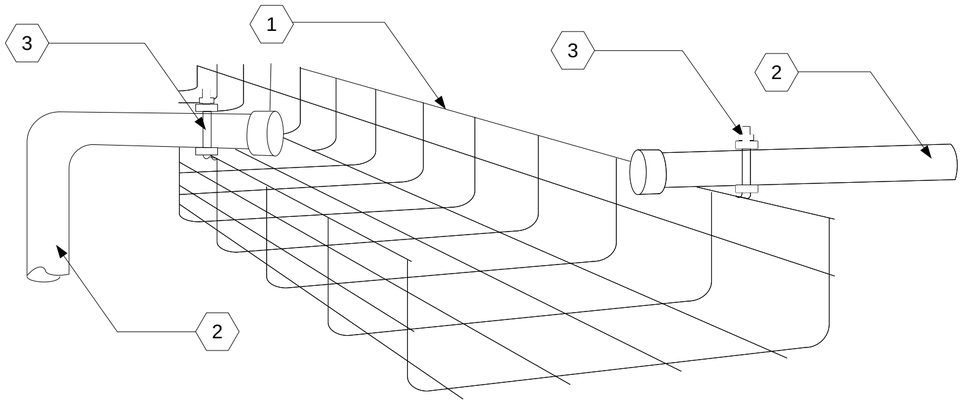
REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

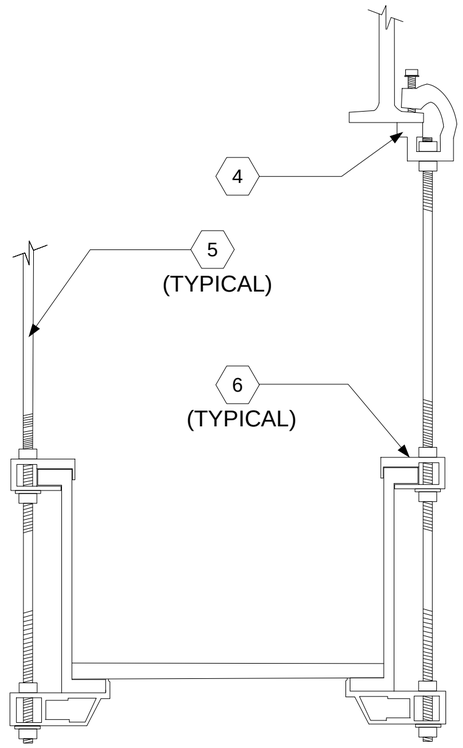
U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.35

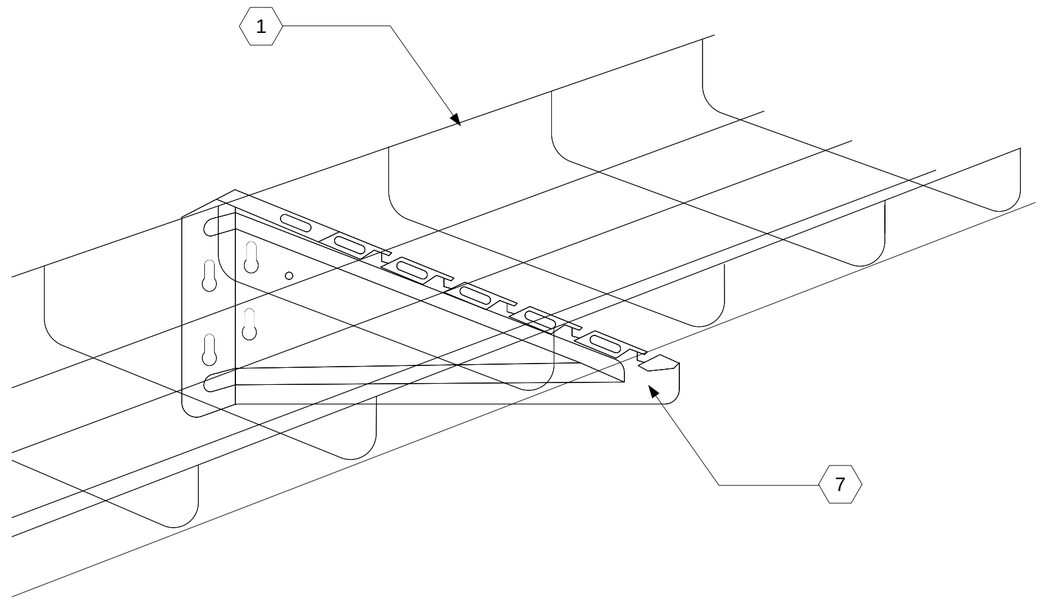


1 CONDUIT TO CABLE TRAY

1. BASKET STYLE CABLE TRAY
2. CONDUIT FROM OUTLET TO CABLE TRAY
3. BOND CONDUIT TO CABLE TRAY
4. BEAM CLAMP FOR CABLE TRAY SUPPORT
5. THREADED ROD (TYPICAL OF ALL SHOWN)
6. CABLE TRAY SUPPORTS (TYPICAL OF ALL SHOWN)
7. TRIANGLE CABLE TRAY SUPPORT BRACKET



2 CABLE TRAY SUPPORT DIAGRAM



3 CABLE TRAY SUPPORT DIAGRAM

TYPICAL CABLE TRAY ENLARGED DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

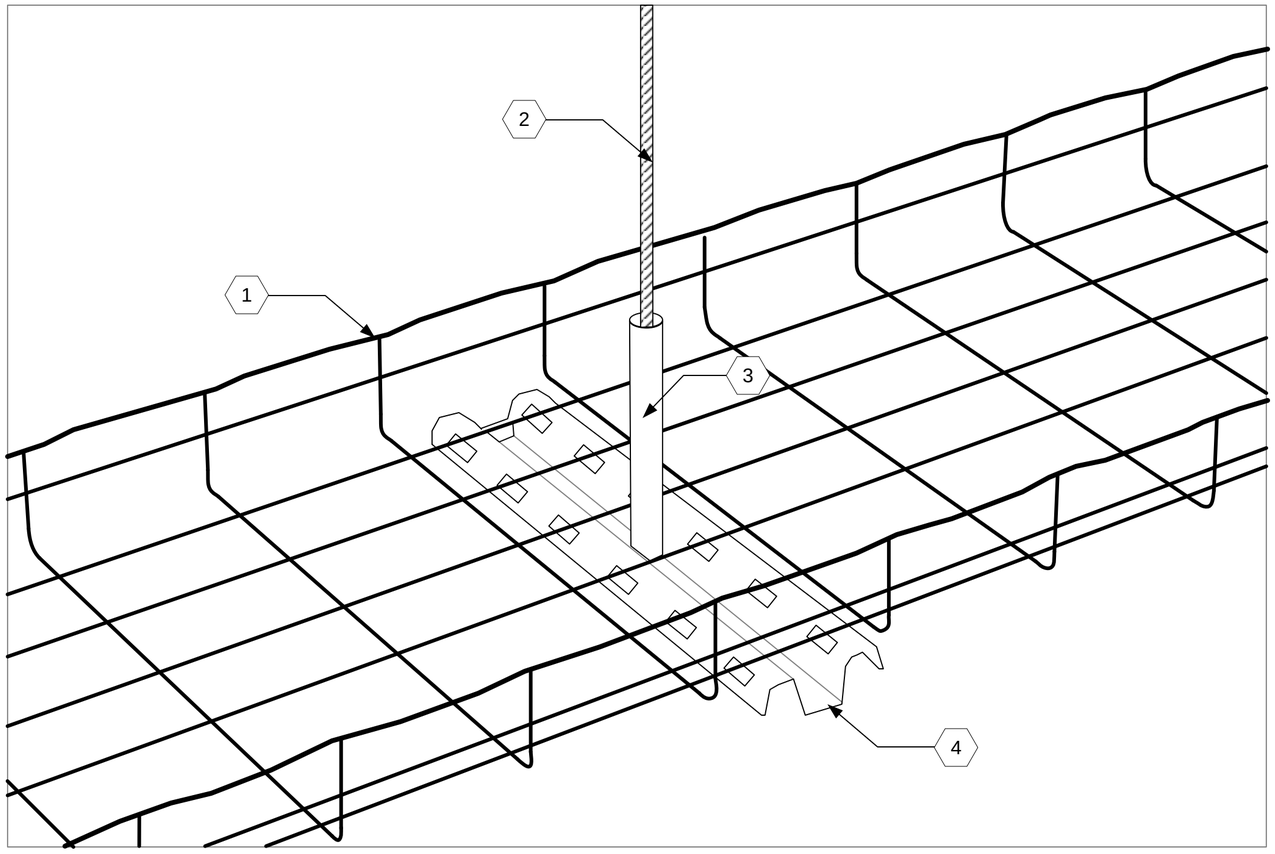
APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.36

1. BASKET STYLE CABLE TRAY
2. THREADED ROD TO CEILING
3. PROTECTIVE BUSHING. MINIMUM 2 INCHES ABOVE TOP OF CABLE TRAY SIDE WALLS
4. BOTTOM HANGER SUPPORT



2 CABLE TRAY SUPPORT DIAGRAM

TYPICAL CENTER HUNG CABLE TRAY ENLARGED DIAGRAMS

ARMY RESERVE

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

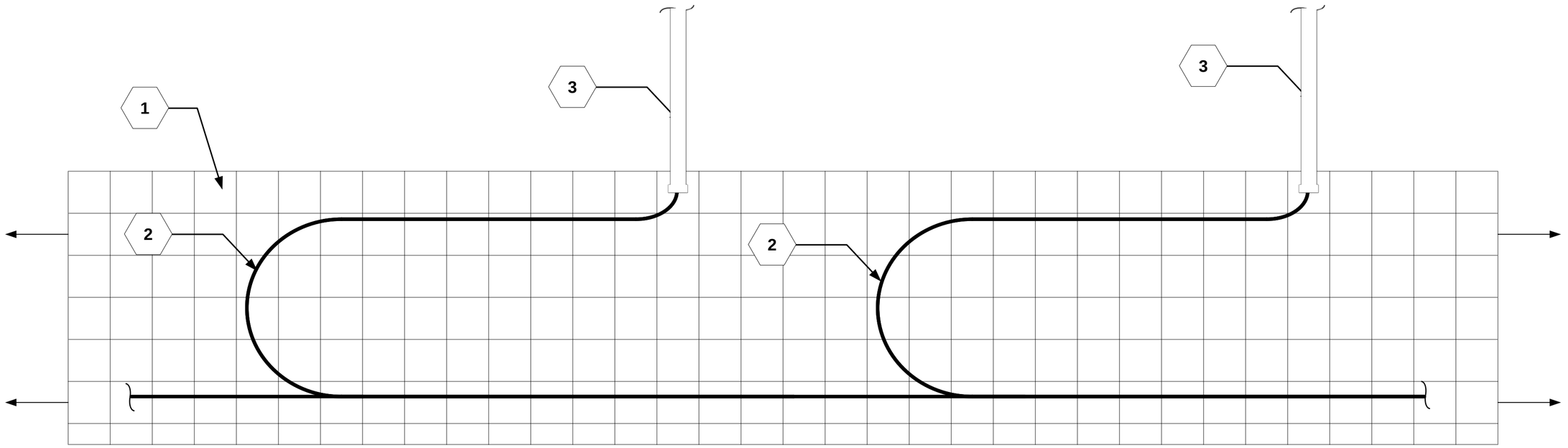
U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.38

1 WIRE MESH CABLE TRAY

2 CATEGORY 6A TEAR DROP CABLE SLACK

3 EMT CONDUIT TO OUTLET LOCATION



2 TYPICAL TEAR DROP CABLE ROUTING DIAGRAM

TYPICAL CABLE ROUTING EXAMPLE ENLARGED DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

LEAD DESIGNER: JOHN BABB

REVIEWED BY: ROBERT BABB

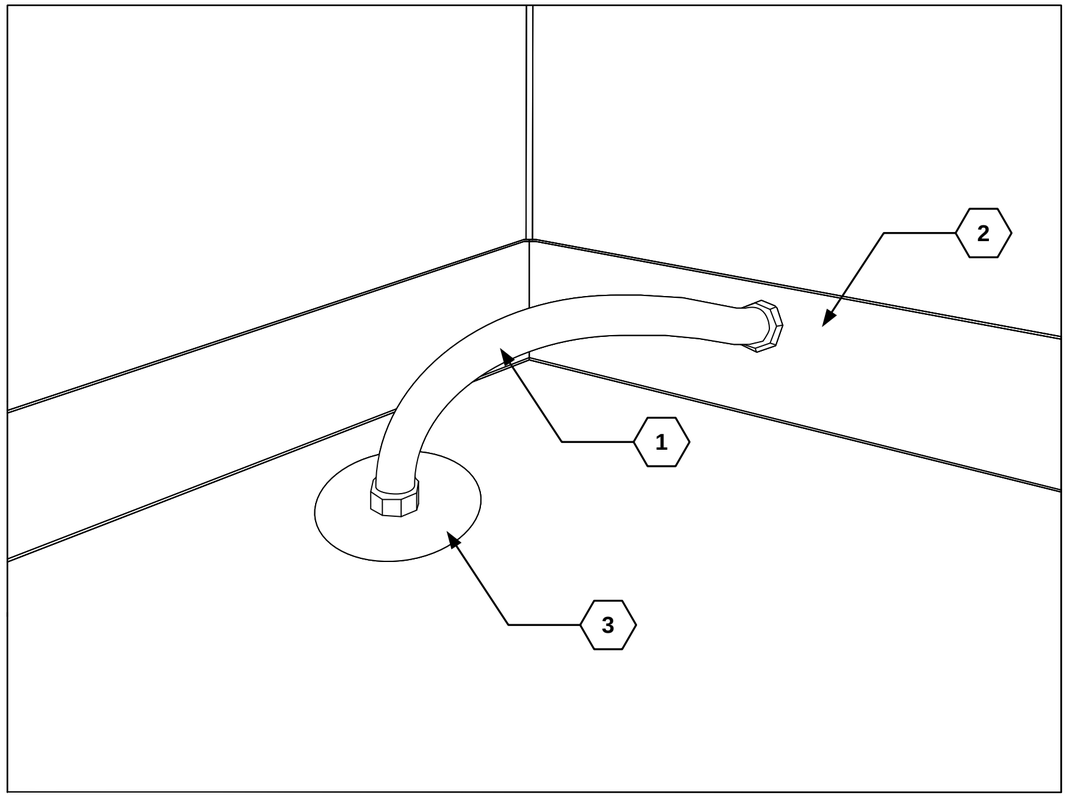
APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

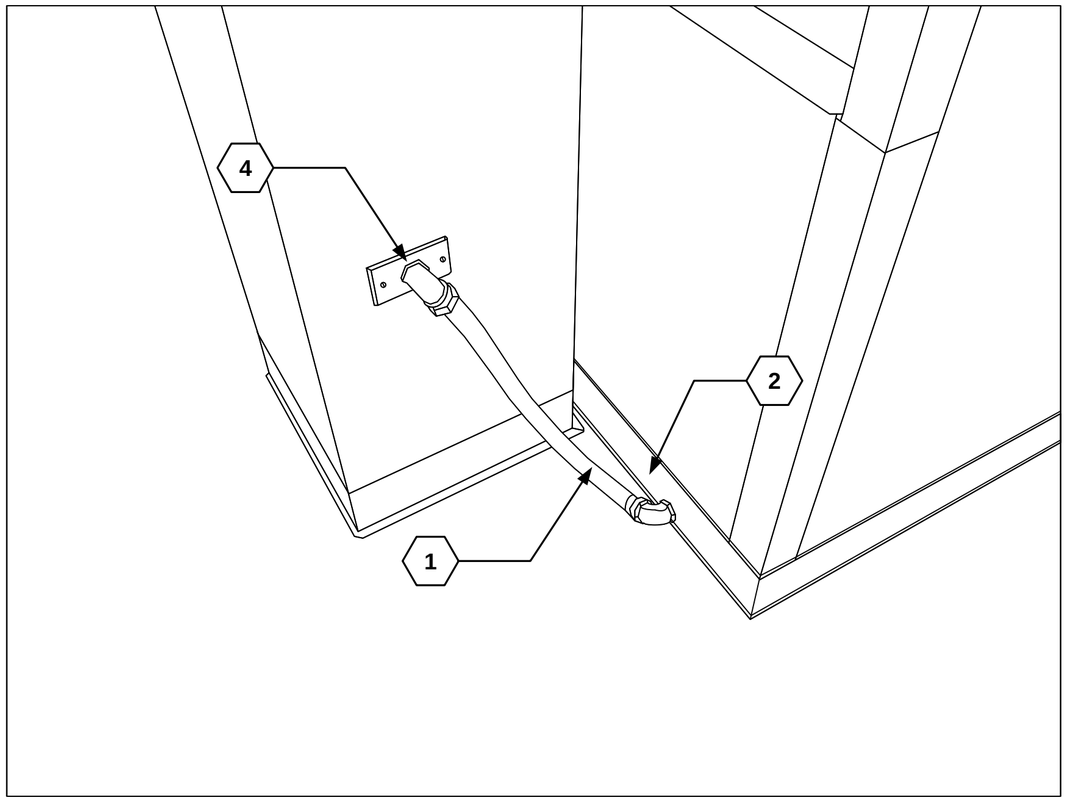
U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.39

1. FLEXIBLE METAL CONDUIT FROM FLOOR BOX TO ACOUSTIC PANEL RACEWAY
2. FURNITURE ACOUSTIC RACEWAY
3. FLOOR BOX OR POKE-THRU
4. WALL MOUNTED JUNCTION BOX



1 WHIP FROM FLOOR BOX/POKE-THRU TO KICK PLATE



2 WHIP FROM JUNCTION BOX TO KICK PLATE

TYPICAL FURNITURE WHIP DETAILS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

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INFRASTRUCTURE
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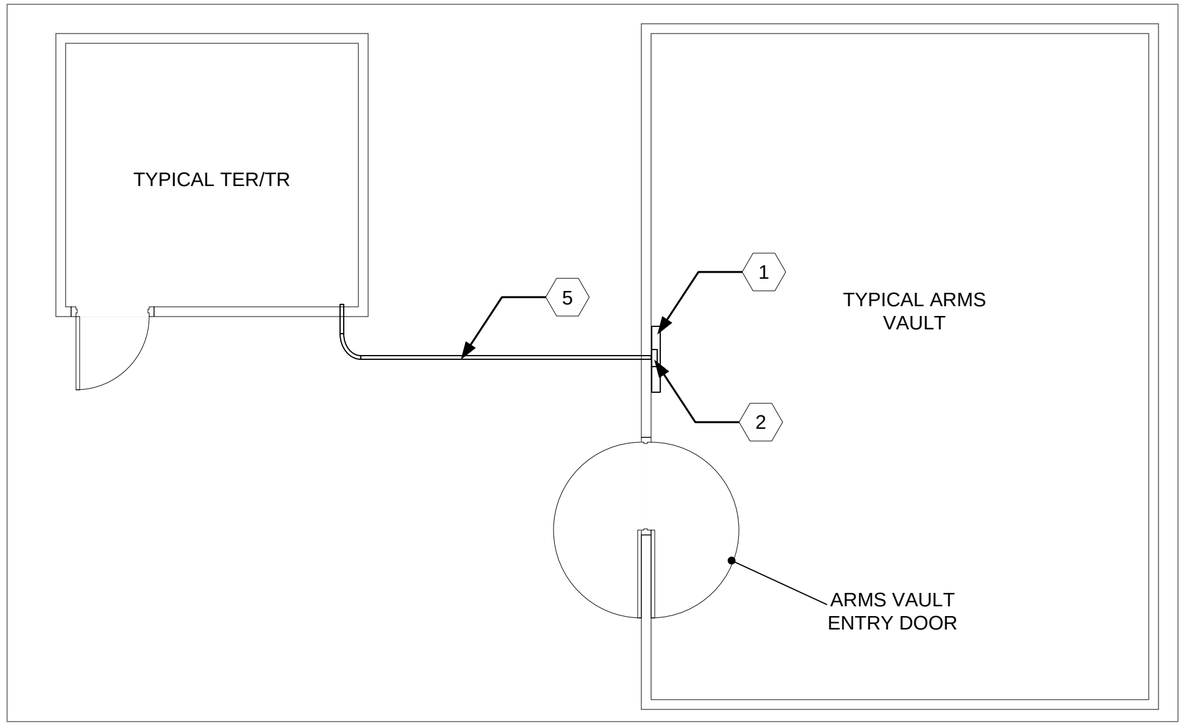
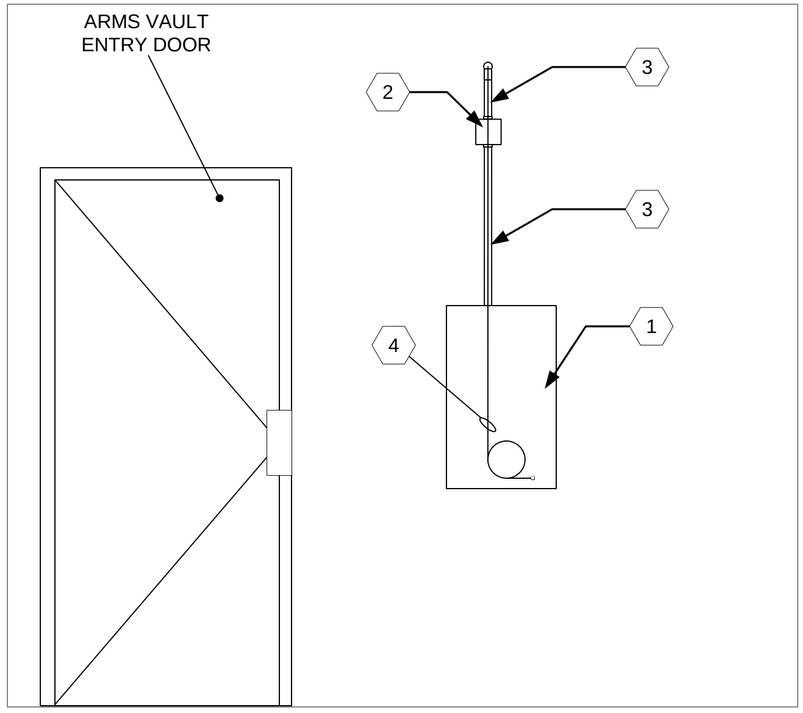
DIAGRAM AND DETAILS

C.40



2 ARMS VAULT TO TER/TR CONDUIT RUN



2 ARMS VAULT IDS PANEL CONDUIT/ CABLE LAYOUT

1. IDS PANEL
2. JUCNTION BOX
3. 1 INCH EMT CONDUIT
4. 2 CATEGORY 6A CABLES HOME RUN FROM TER/ TR. TERMINATE BOTH CABLES WITH 8P8C JACKS AND PROVIDE 8-12 INCHES OF SLACK WITHIN THE IDS PANEL
5. 1 INCH EMT CONDUIT HOMERUN FROM TER/TR TO ARMS VAULT JUNCTION BOX

TYPICAL ARMS VAULT IDS DETAILS

ARMY RESERVE

REVISIONS

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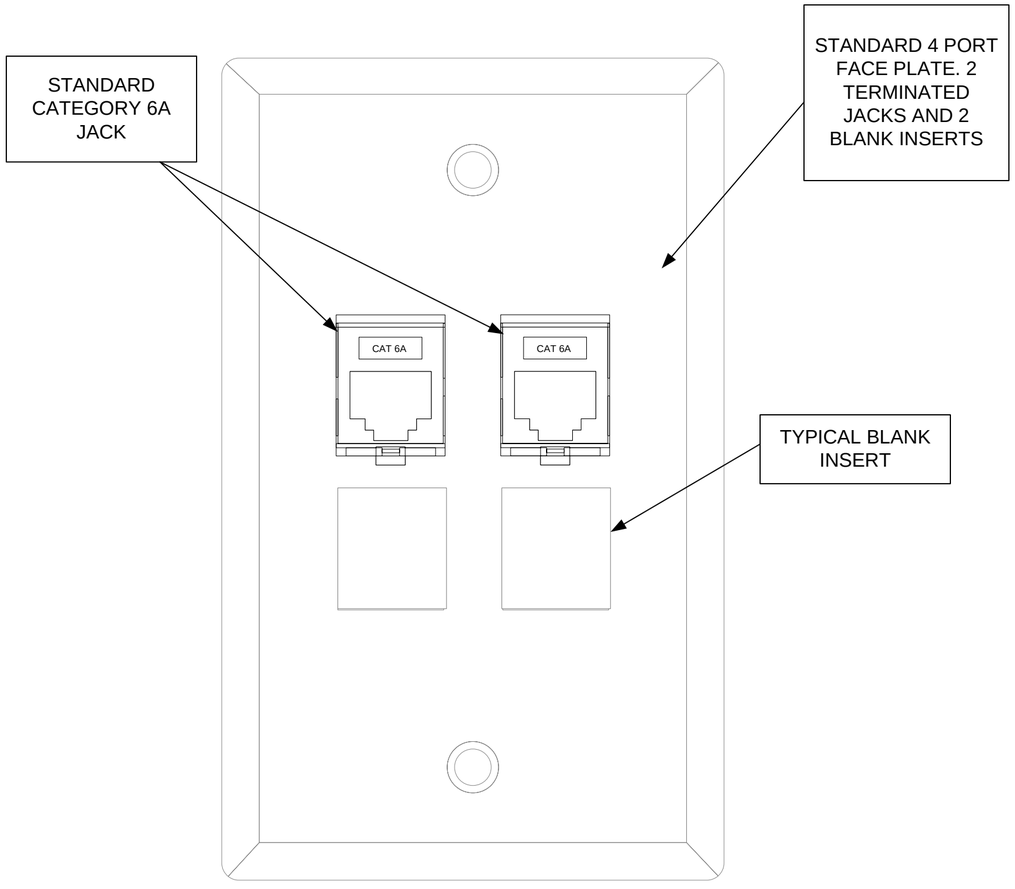
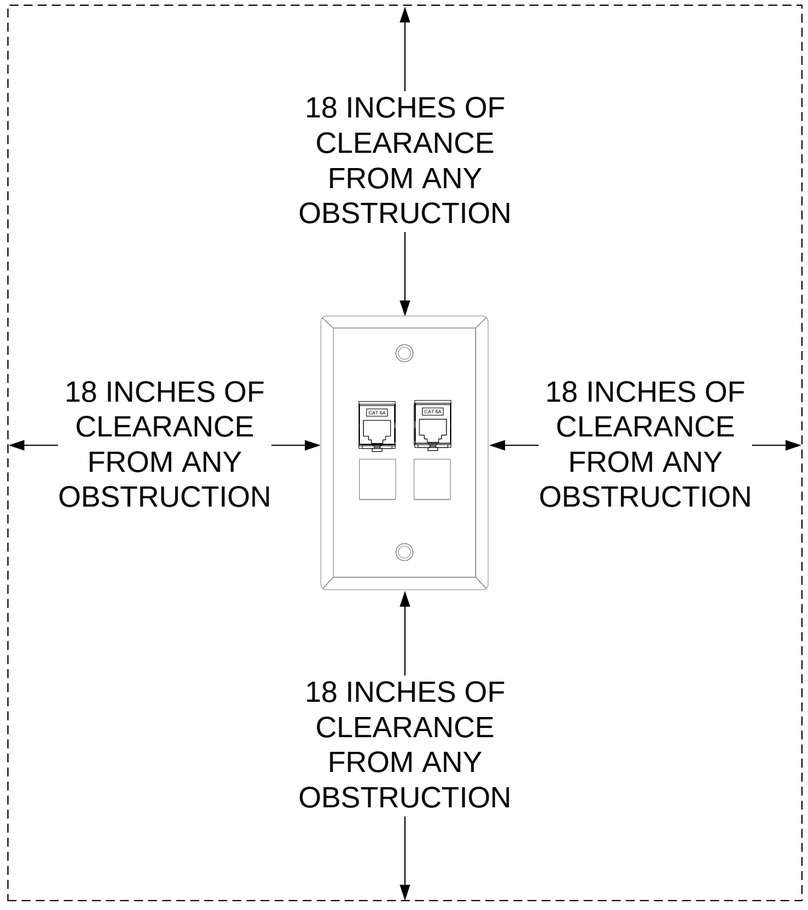
C.41



1 ABOVE AND BELOW CEILING WAP OUTLET



NOTE: 18 INCHES OF CLEARANCE DOES NOT APPLY TO ABOVE CEILING WAP OUTLETS.

2 WAP OUTLET CLEARANCE DIAGRAM

WAP OUTLET AND WAP OUTLET CLEARANCE DIAGRAMS

ARMY RESERVE

REVISIONS

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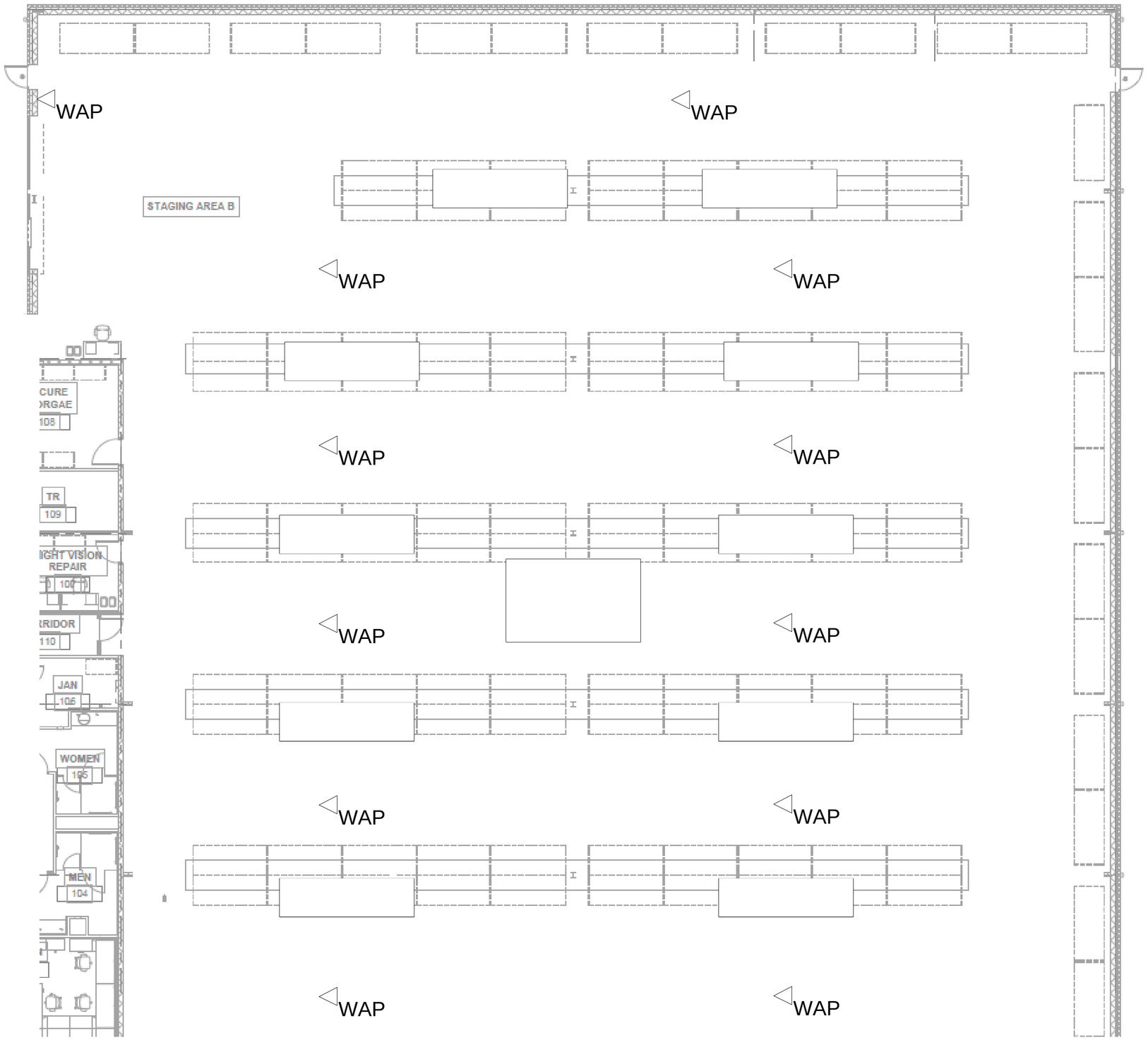
U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.42

1. WHEREVER POSSIBLE, WAP OUTLETS IN UNIT STORAGE SHOULD BE LOCATED WITHIN THE CORRDIDORS BETWEEN THE CAGES AND THE OUTLET BOXES SHOULD BE ATTACHED TO THE EXPOSED STRUCTURAL STEEL BELOW THE CEILING.



TYPICAL UNIT STORAGE/WAREHOUSE WAP OUTLET PLACEMENT DIAGRAM

ARMY RESERVE

REVISIONS

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DATE: 27-NOV-2024

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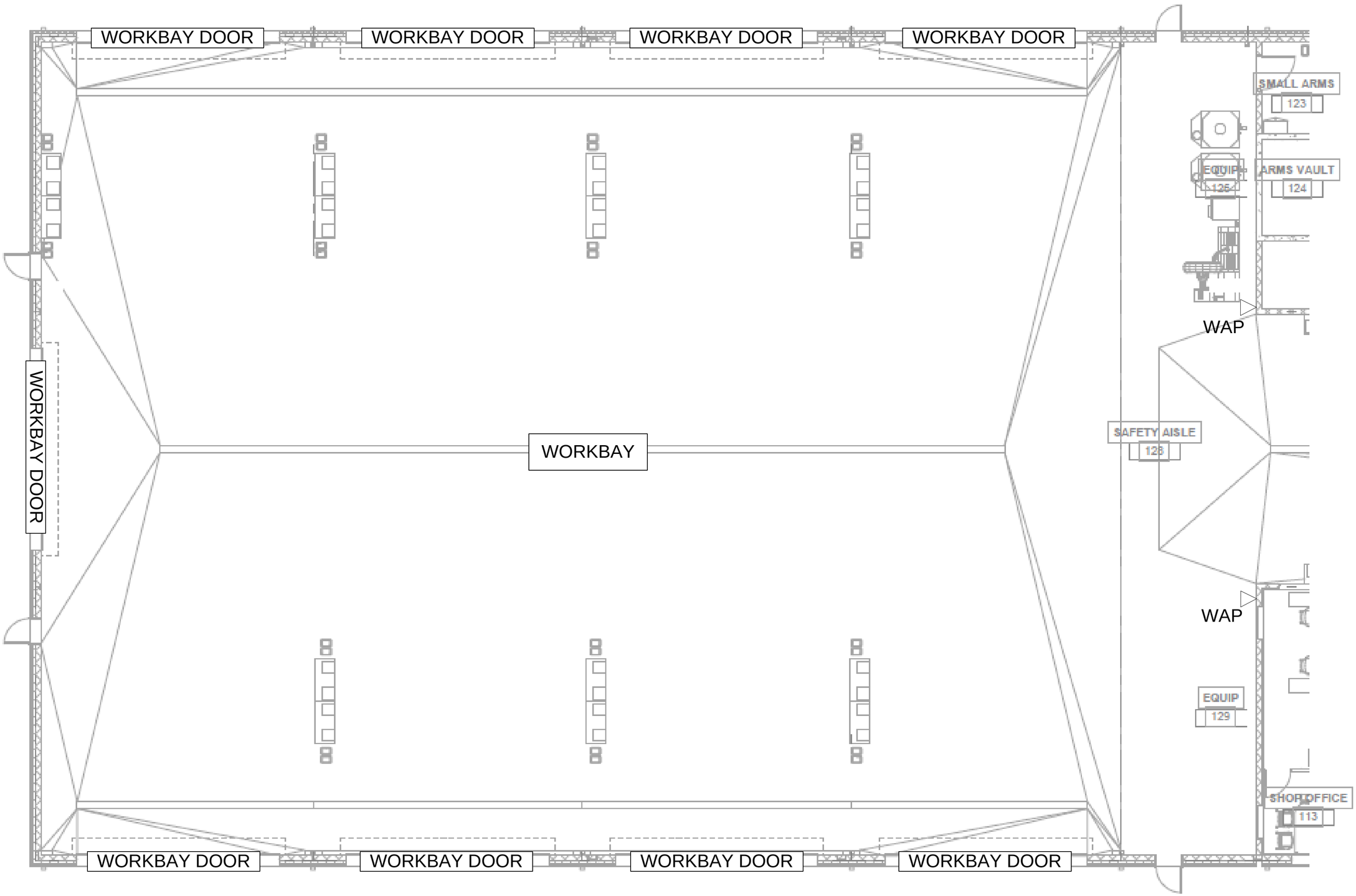
C.43



TYPICAL VMS/AMSA WORKBAY WAP OUTLET PLACEMENT DIAGRAM

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

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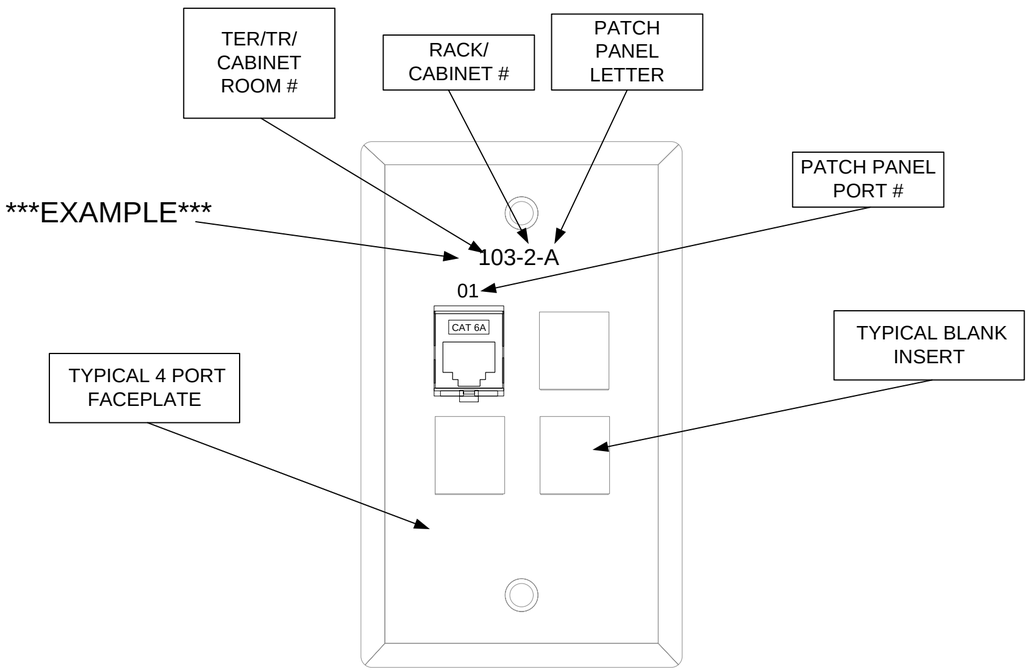
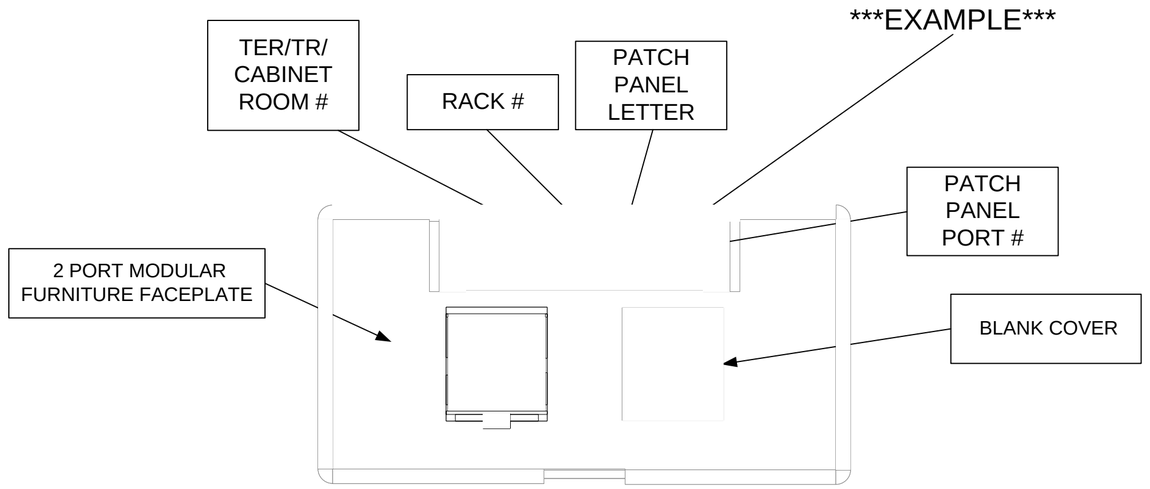
DIAGRAM AND DETAILS

C.44

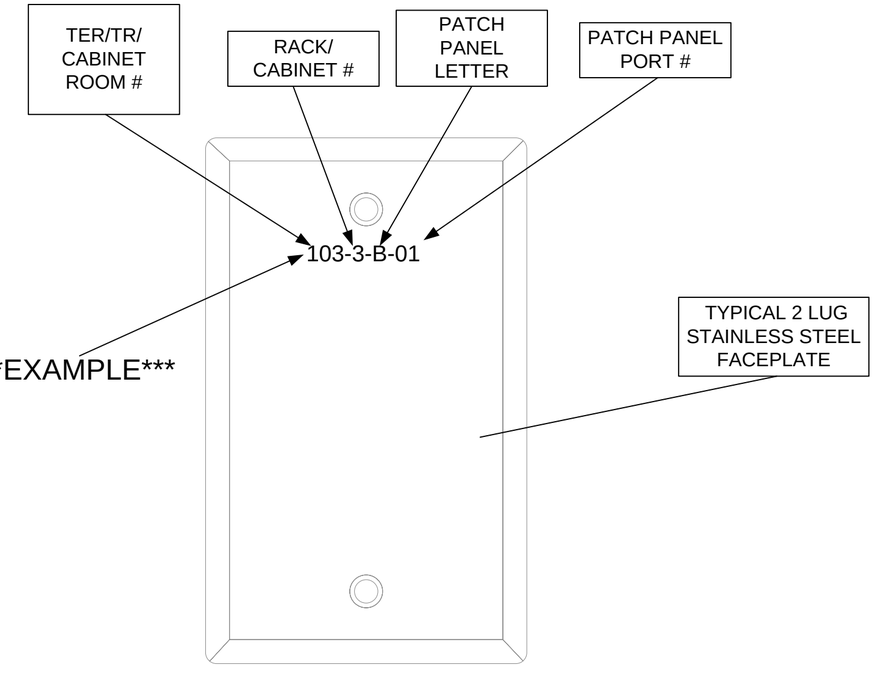


1 TELECOMMUNICATIONS OUTLET LABELING SCHEME

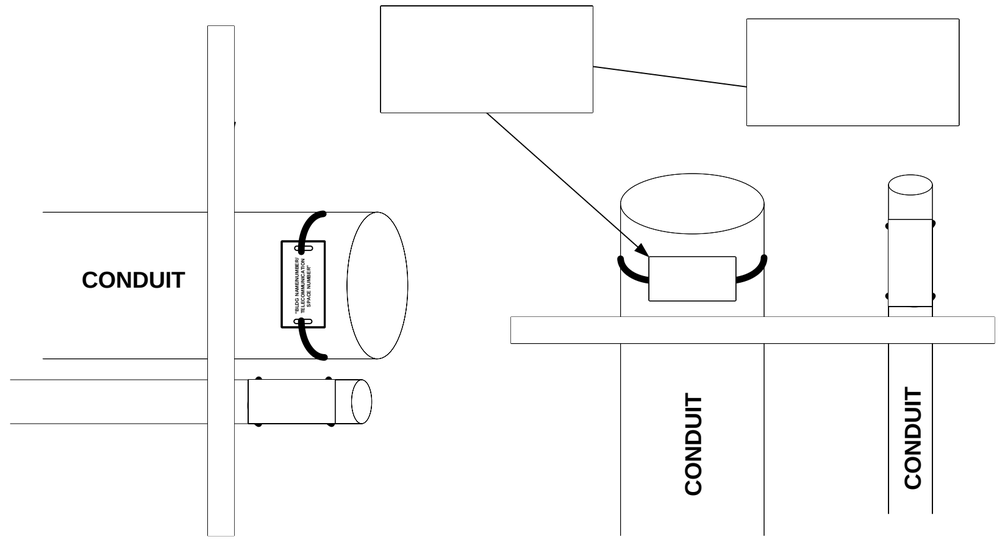
1. ALL LABELS SHOWN ILLUSTRATE THE REQUIRED FORMAT OF THE LABELING AND ARE EXAMPLES ONLY. THEY ARE NOT MEANT TO SHOW THE EXACT LABELING SCHEME FOR ANY GIVEN PROJECT.



2 FURNITURE TELECOMMUNICATIONS OUTLET LABELING SCHEME



3 WALL PHONE FACEPLATE LABELING SCHEME



4 CONDUIT LABELS

FACEPLATE/CONDUIT LABELING DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

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NETWORK ENTERPRISE CENTER
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TECHNICAL CRITERIA
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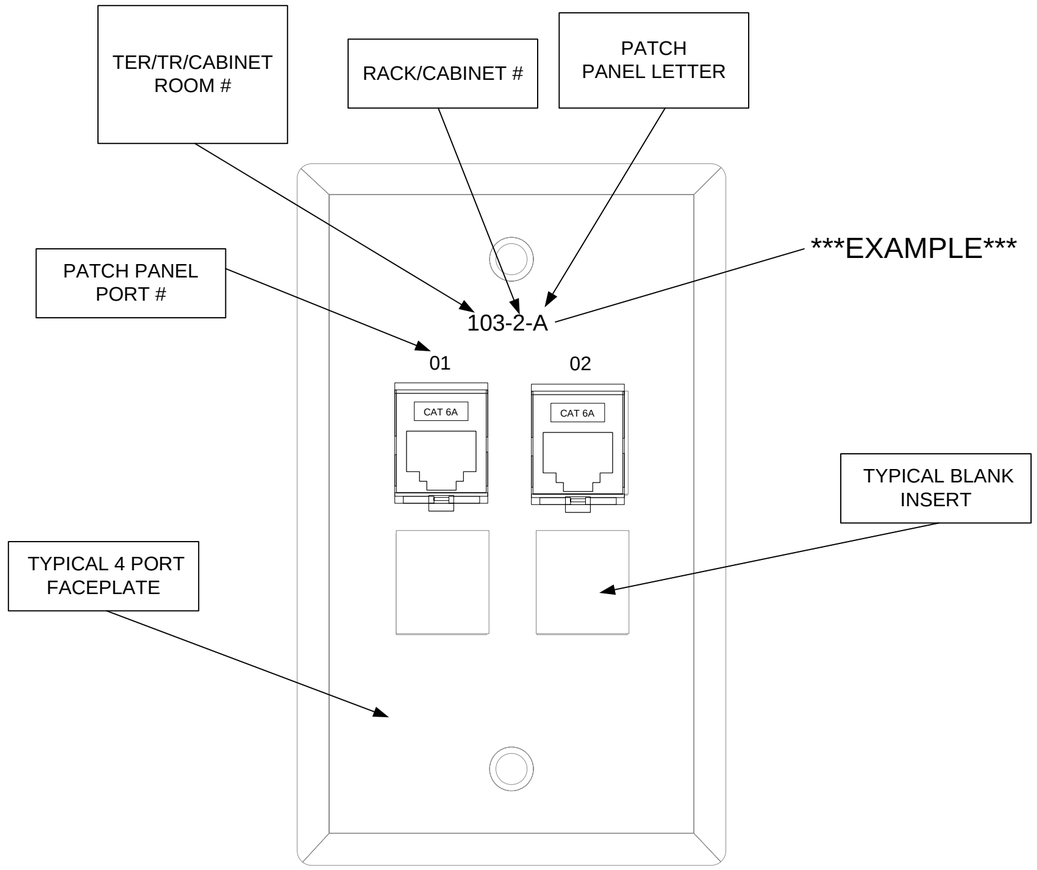
C.45

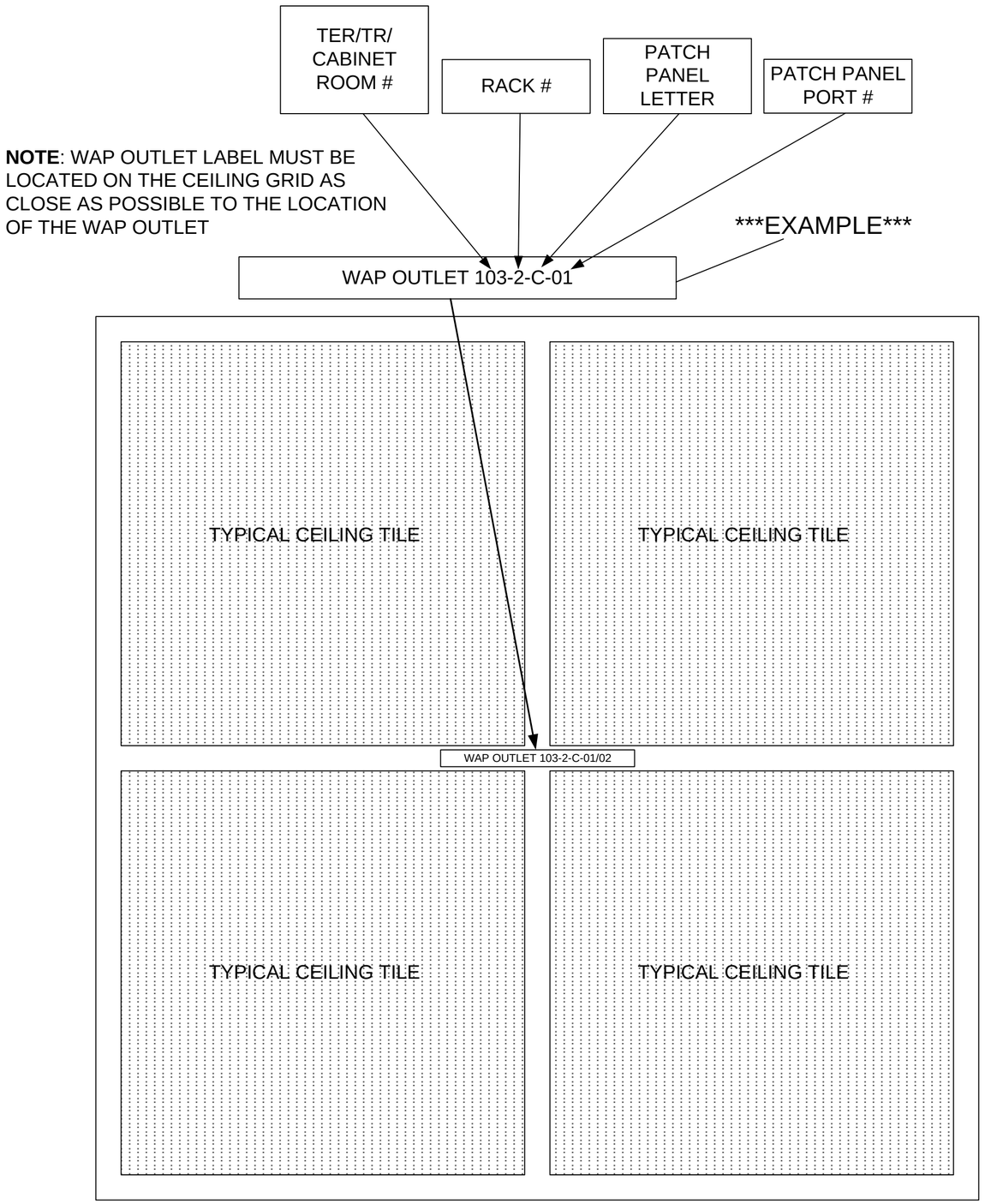
SHEET GENERAL NOTES

1. ALL LABELS SHOWN ILLUSTRATE THE REQUIRED FORMAT OF THE LABELING AND ARE EXAMPLES ONLY. THEY ARE NOT MEANT TO SHOW THE EXACT LABELING SCHEME FOR ANY GIVEN PROJECT.



1 WAP OUTLET LABELING SCHEME

NOTE: WAP OUTLET LABEL MUST BE LOCATED ON THE CEILING GRID AS CLOSE AS POSSIBLE TO THE LOCATION OF THE WAP OUTLET



2 CEILING GRID LABEL FOR ABOVE CEILING WAP

WAP COMPONENTS LABELING DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

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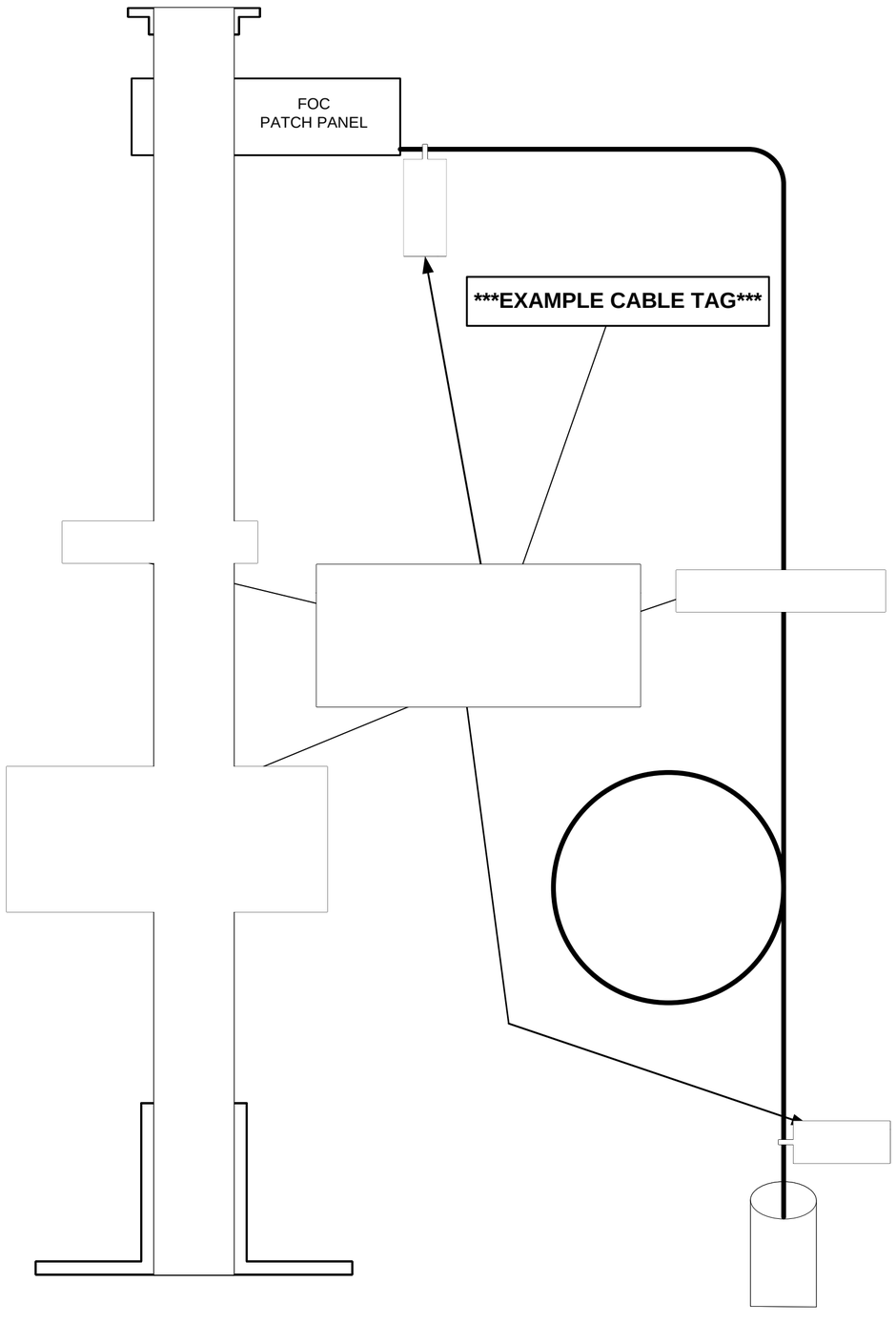
USARC CIO, G-6

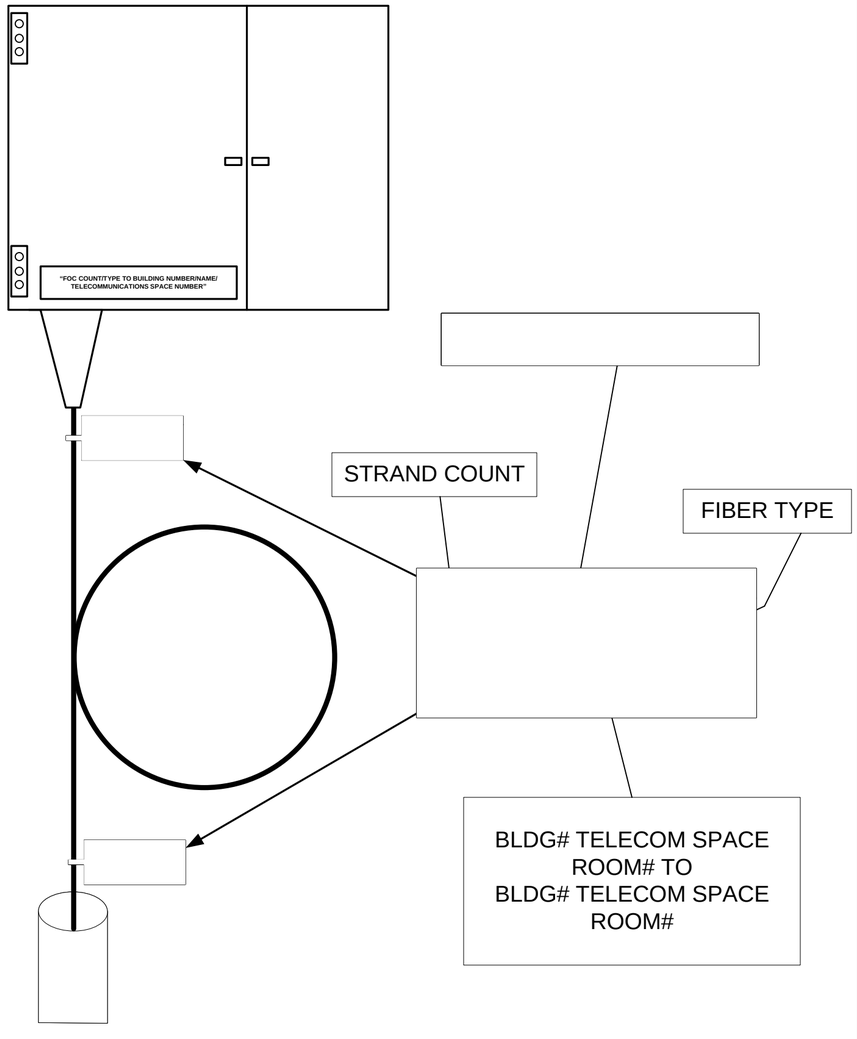
U.S. ARMY RESERVE NETWORK ENTERPRISE CENTER INFRASTRUCTURE TECHNICAL CRITERIA DIAGRAM AND DETAILS

C.46

1. ALL LABELS SHOWN ILLUSTRATE THE REQUIRED FORMAT OF THE LABELING AND ARE EXAMPLES ONLY. THEY ARE NOT MEANT TO SHOW THE EXACT LABELING SCHEME FOR ANY GIVEN PROJECT.



1 FOC CABLE AND RACK MOUNTED FOC PATCH PANEL LABELS



2 FOC CABLE AND WALL MOUNTED FOC PATCH PANEL LABELS

FOC LABELING DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

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APPROVED BY: EMILIO PEREZ

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U.S. ARMY RESERVE
NETWORK ENTERPRISE CENTER
INFRASTRUCTURE
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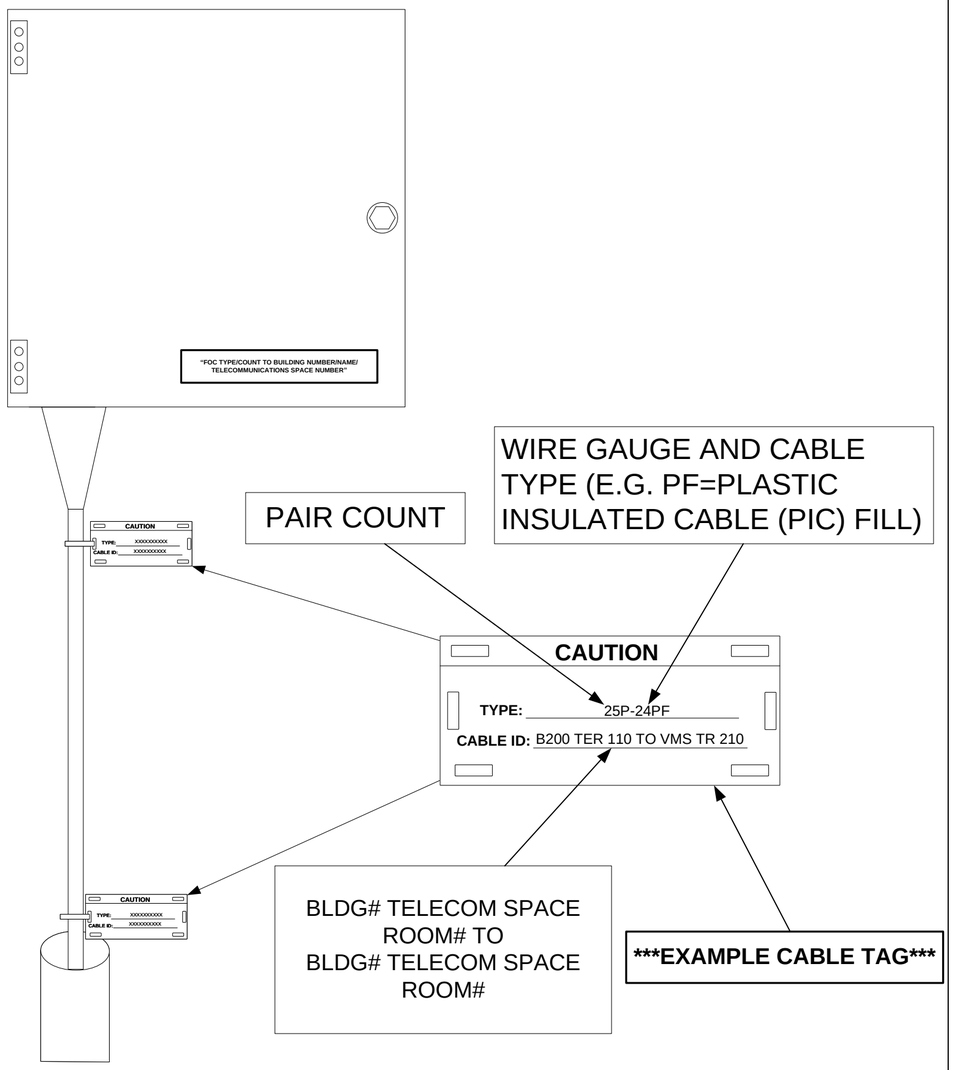
DIAGRAM AND DETAILS

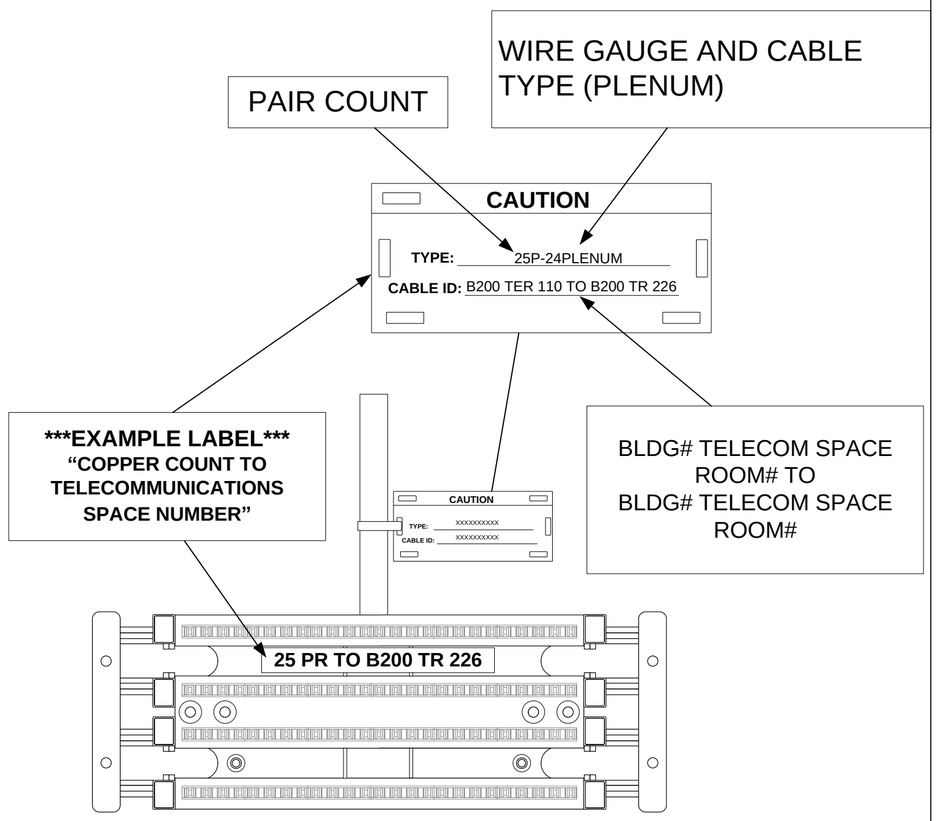
C.47

SHEET GENERAL NOTES

1. ALL LABELS SHOWN ILLUSTRATE THE REQUIRED FORMAT OF THE LABELING AND ARE EXAMPLES ONLY. THEY ARE NOT MEANT TO SHOW THE EXACT LABELING SCHEME FOR ANY GIVEN PROJECT.



1 COPPER BACKBONE CABLE AND BUILDING ENTERANCE PROTECTOR LABELS



2 COPPER BACKBONE CABLE AND 110 BLOCK LABLES

COPPER LABELING DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

DATE: 27-NOV-2024

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REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

USARC CIO, G-6

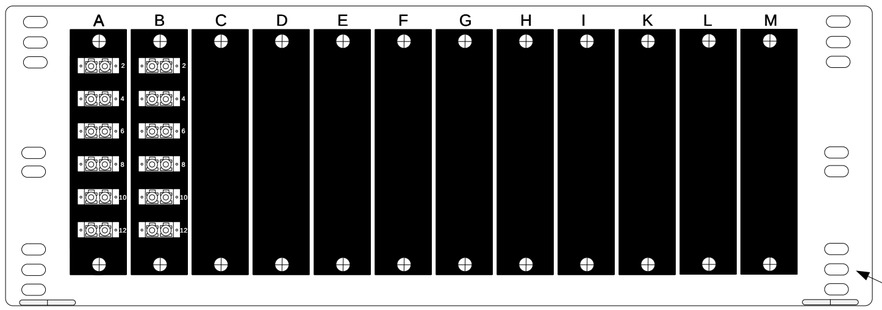
U.S. ARMY RESERVE NETWORK ENTERPRISE CENTER INFRASTRUCTURE TECHNICAL CRITERIA DIAGRAM AND DETAILS

C.48

SHEET GENERAL NOTES

1. ALL LABELS SHOWN ILLUSTRATE THE REQUIRED FORMAT OF THE LABELING AND ARE EXAMPLES ONLY. THEY ARE NOT MEANT TO SHOW THE EXACT LABELING SCHEME FOR ANY GIVEN PROJECT.

ENLARGED FOC PATCH PANEL DIAGRAM



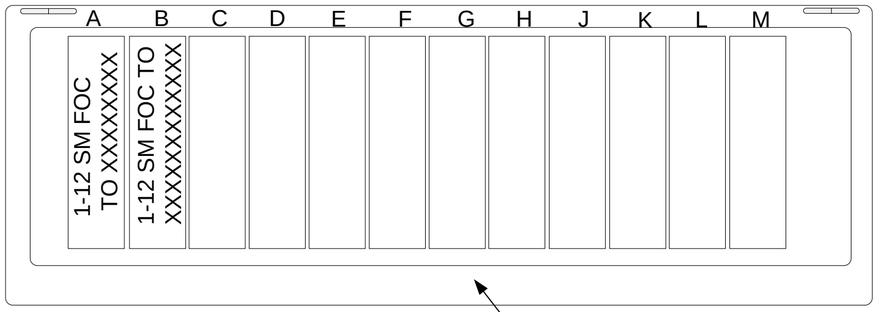
A: 1-12 SM FOC TO TELECOMMUNICATION SPACE NUMBER

B: 1-12 SM FOC TO BUILDING NAME/NUMBER/ TELECOMMUNICATIONS SPACE NUMBER

EXAMPLE

B: 1-12 SM FOC TO VMS BUILDING / TR 102

FOC PATCH PANEL OUTSIDE OF FRONT COVER



FOC PATCH PANEL INSIDE OF FRONT COVER

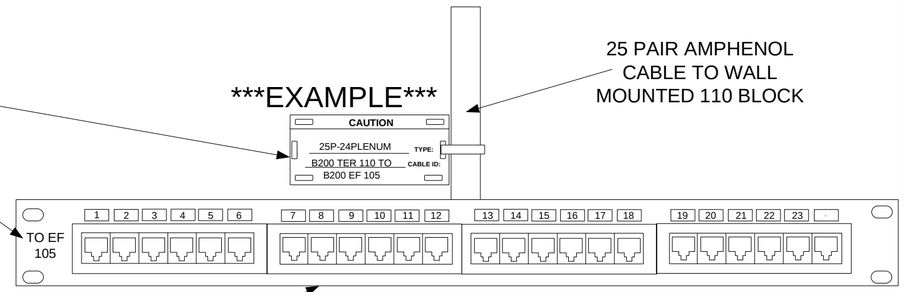
EXAMPLE

TO EF 105

ENLARGED 24 PORT 8P2C TELCO PATCH PANEL

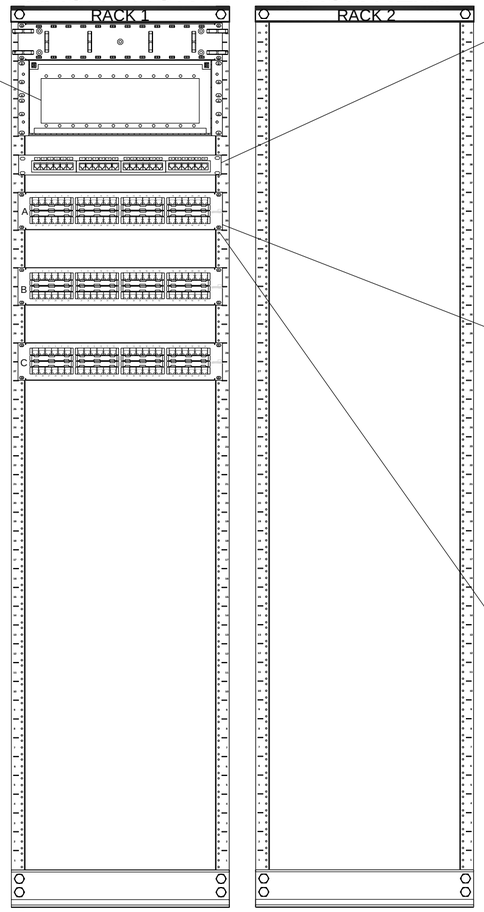
EXAMPLE

25 PAIR AMPHENOL CABLE TO WALL MOUNTED 110 BLOCK

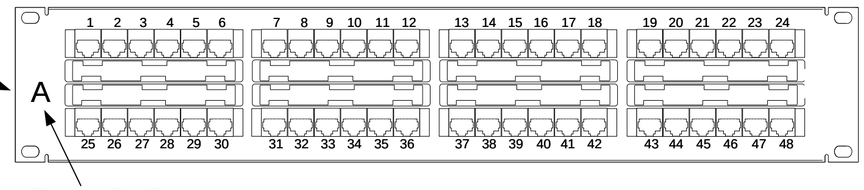


RACK FRONT

RACK REAR

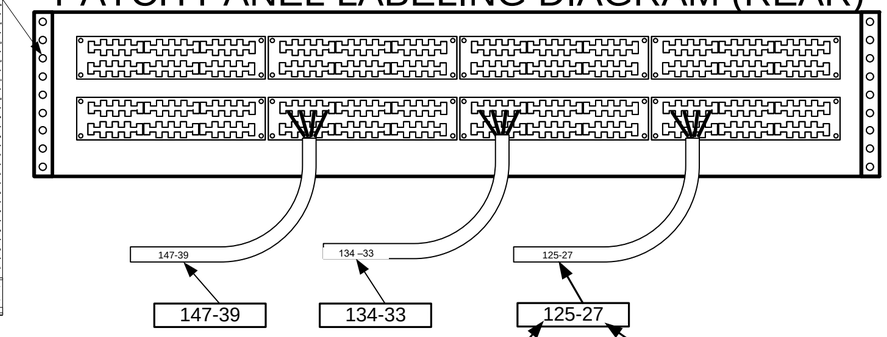


ENLARGED 48 PORT CATEGORY 6A PATCH PANEL LABELING DIAGRAM (FRONT)



EXAMPLE

ENLARGED 48 PORT CATEGORY 6A PATCH PANEL LABELING DIAGRAM (REAR)



EXAMPLES

ROOM NUMBER WHERE OUTLET IS LOCATED **(NOT TER/TR ROOM NUMBER)**

PATCH PANEL PORT NUMBER

RACK/PATCH PANEL LABELING DIAGRAMS

ARMY RESERVE

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REVIEWED BY: ROBERT BABB

APPROVED BY: EMILIO PEREZ

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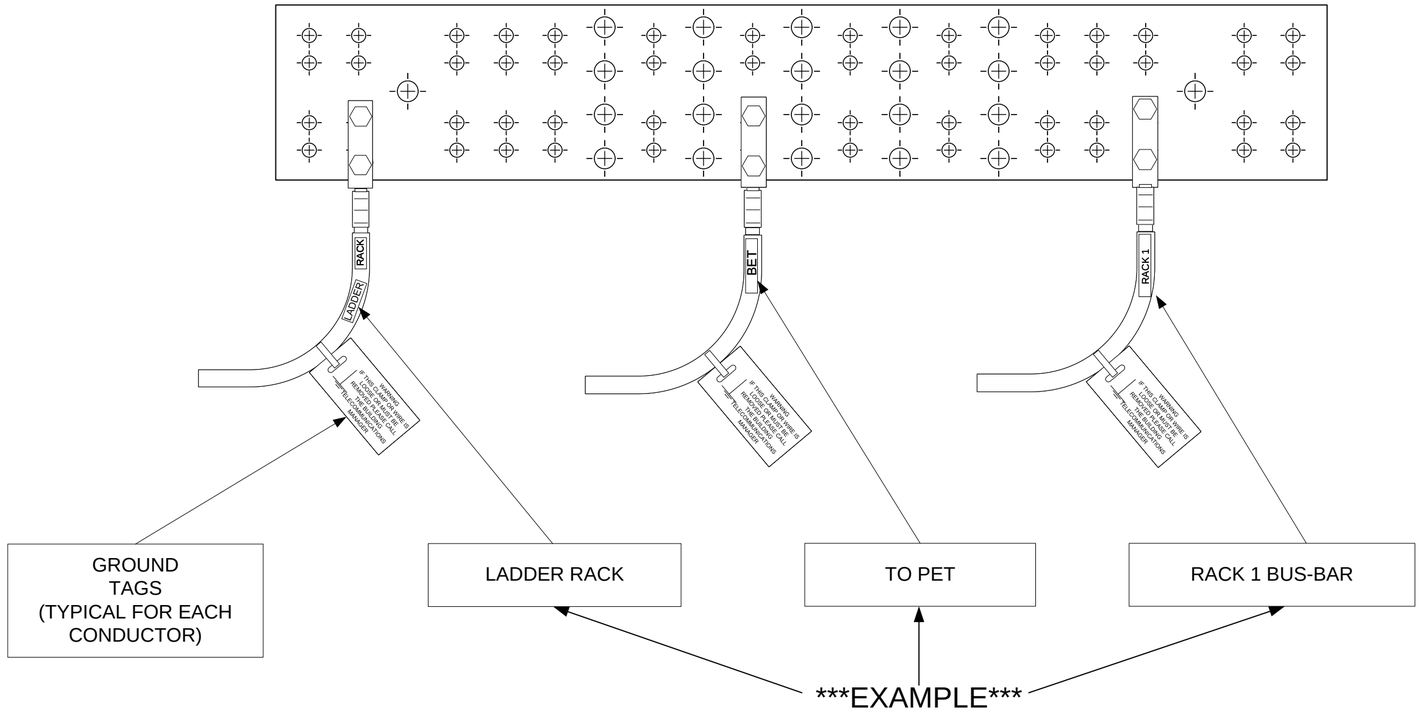
U.S. ARMY RESERVE NETWORK ENTERPRISE CENTER INFRASTRUCTURE TECHNICAL CRITERIA DIAGRAM AND DETAILS

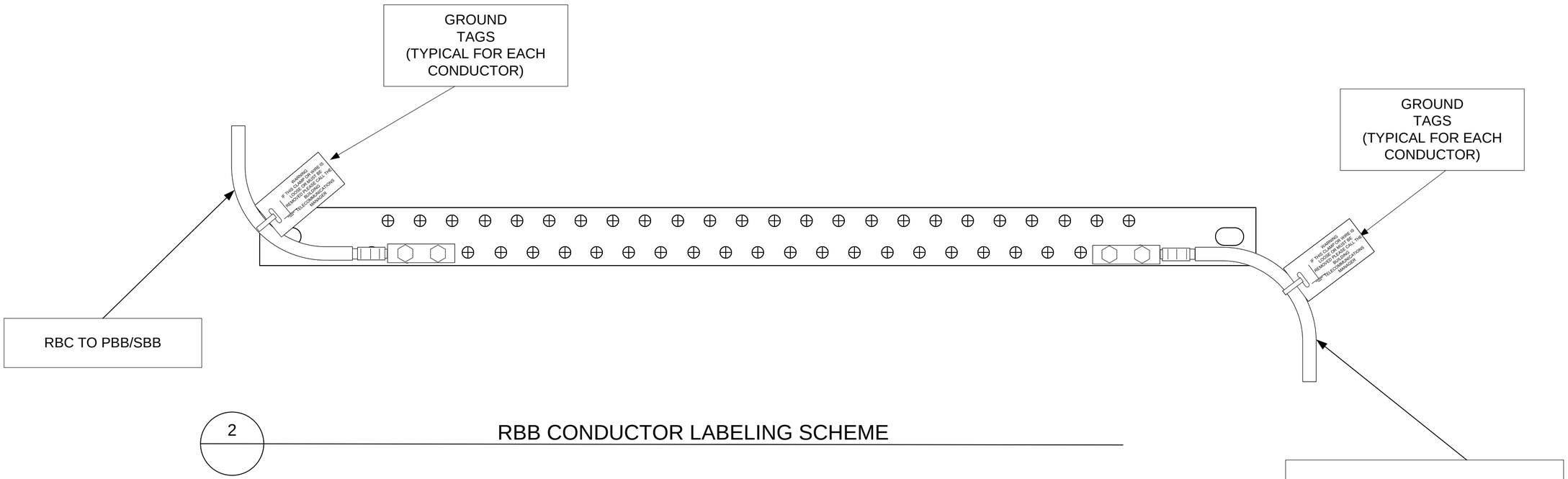
C.49

SHEET GENERAL NOTES

1. ALL LABELS SHOWN ILLUSTRATE THE REQUIRED FORMAT OF THE LABELING AND ARE EXAMPLES ONLY. THEY ARE NOT MEANT TO SHOW THE EXACT LABELING SCHEME FOR ANY GIVEN PROJECT.



1 WALL MOUNTED PBB/SBB CONDUCTOR LABELING SCHEME



2 RBB CONDUCTOR LABELING SCHEME

BUSBAR LABELING DIAGRAMS

ARMY RESERVE

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPR.

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APPROVED BY: EMILIO PEREZ

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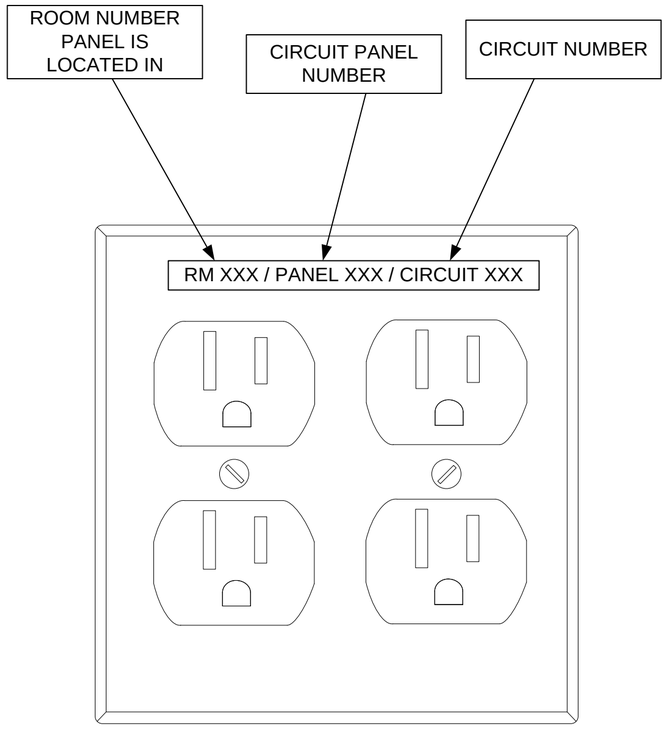
DIAGRAM AND DETAILS

C.50

SHEET GENERAL NOTES

1. ALL LABELS SHOWN ILLUSTRATE THE REQUIRED FORMAT OF THE LABELING AND ARE EXAMPLES ONLY. THEY ARE NOT MEANT TO SHOW THE EXACT LABELING SCHEME FOR ANY GIVEN PROJECT.



1 TELECOMMUNICATIONS EQUIPMENT RACK/CABINET DEDICATED ELECTRICAL RECEPTACLE LABELING DIAGRAM

RACK RECEPTACLE LABELING DIAGRAMS

ARMY RESERVE

REVISIONS

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APPROVED BY: EMILIO PEREZ

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NETWORK ENTERPRISE CENTER
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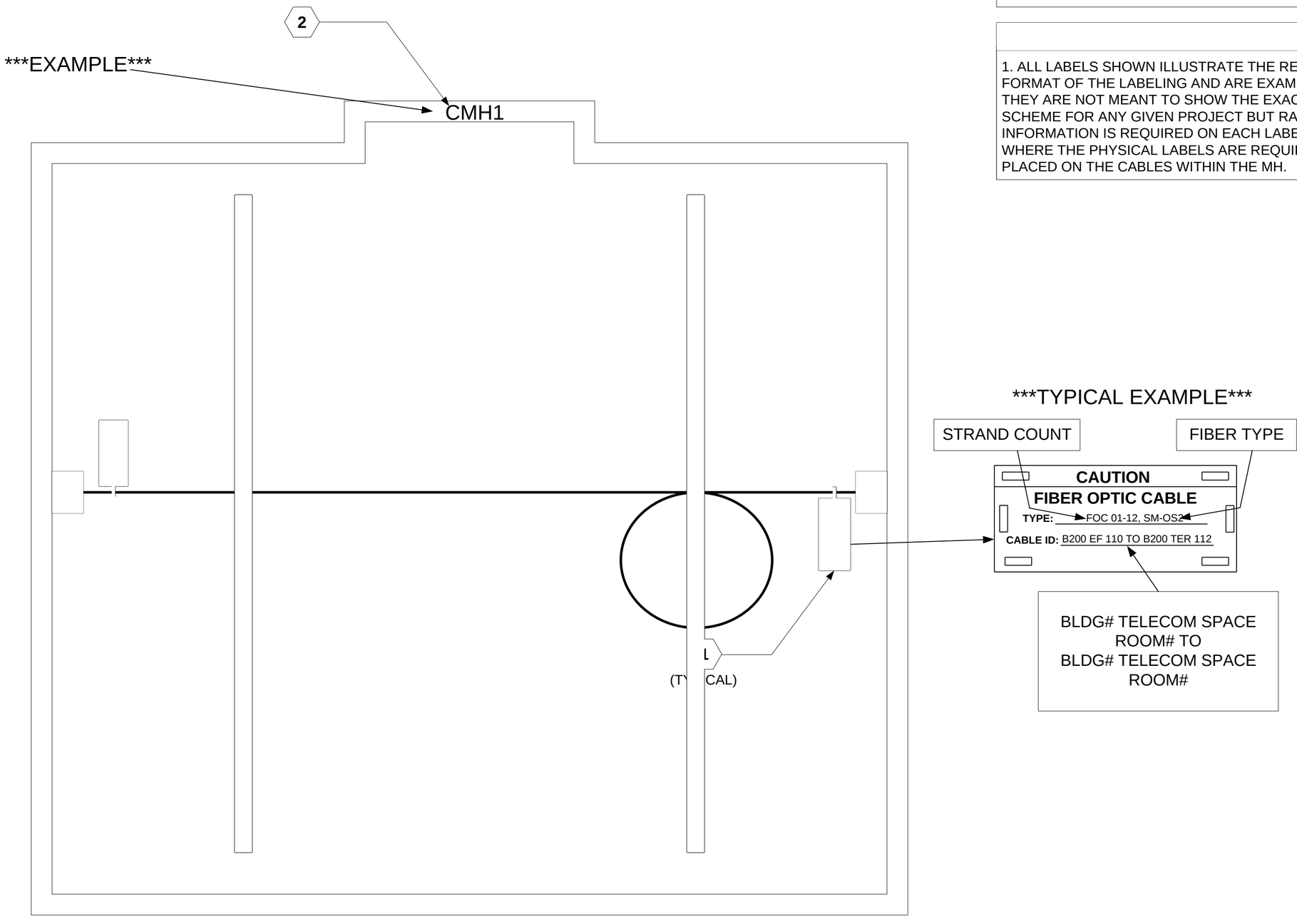
DIAGRAM AND DETAILS

C.51

1. WATER-PROOF SELF LAMINATING CABLE TAGS SHALL BE INSTALLED ON ALL BACKBONE CABLING WITHIN 1 FOOT OF ENTERING/ EXITING CONDUIT

2. MAINTENANCE HOLE STENCIL

1. ALL LABELS SHOWN ILLUSTRATE THE REQUIRED FORMAT OF THE LABELING AND ARE EXAMPLES ONLY. THEY ARE NOT MEANT TO SHOW THE EXACT LABELING SCHEME FOR ANY GIVEN PROJECT BUT RATHER WHAT INFORMATION IS REQUIRED ON EACH LABEL AND WHERE THE PHYSICAL LABELS ARE REQUIRED TO BE PLACED ON THE CABLES WITHIN THE MH.



1 TYPICAL MAINTENANCE HOLE LABELING SCHEMES

MAINTENANCE HOLE BACKBONE CABLE LABELING DIAGRAMS

ARMY RESERVE

REVISIONS

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INFRASTRUCTURE
TECHNICAL CRITERIA
DIAGRAM AND DETAILS

C.52