

2.3.1 Exterior Equipment Cabinets -Large

Exterior Equipment Cabinets* are any outdoor (or open area indoor) NEMA Communication Equipment Cabinet, including Micro Distribution Cabinets (MDC) and mixed-use MDC's, which shall be housed in a weatherproof cabinet. For reference, these cabinets shall be modeled after the ITS/COMM 332/334 Cabinet with a custom width option of 27" (or greater) for single/2-door or the ITS/COMM 340 Cabinet with a custom width option of 52" (or greater) for double/4-door. See all clarifying specifications below.

() Note these cabinets may also be specified for INTERIOR use when placed outside of a protected barrier, such as a communication room or other walled or fenced barrier. These cabinets will offer both physical and environmental protection in open space interior installations.*

- CABINET STRUCTURE (SHELL)
 - All Cabinets shall be NEMA 3R
 - Cabinets shall carry a UL Label
 - Cabinet shall be constructed of 12-gauge minimum type 316 stainless or 0.125 inch minimum type 5052-H32 mill-finish aluminum
 - When engineer specified, to achieve a 'X' rating on an aluminum cabinet, add a clear gloss finish powder coat to the exterior. Where cabinet is potentially full sun exposed, utilize a white gloss coat. These areas will typically be placed near Airport Movement Area (AMA) or airport perimeter road; take active measures to flag cabinet for visibility. White color is only for cabinets exposed to full sun and not meant for high foot and tug traffic areas on Airport Operations Area (AOA) or ramp
 - All seams shall be continuously welded
 - Cabinet shall come from manufacture with horizontally wall welded mounting channels, 12-gauge, T-slot, stainless steel or aluminum 1-5/8" steel channel.
 - Channels shall be capable of equipment rack loading to the minimum weight limit set forth by engineer. Place a minimum of (2) front to back of cabinet mounting channels per side. Double cabinets shall in addition, require center channels on each side of center wall
 - No cabinets may be furnished with, or field modified with, top/roof penetrations of any kind. Conduit entry shall enter through open base bottom (preferred) or the side wall in bottom third of cabinet on the left or right and utilize insulated watertight hub for rigid/IMC conduit. Telecom grade conduit is allowed for side penetrations
 - FIELD NOTE: Limit all cabinet side penetrations. For Communications, use a maximum of (3) 2" side penetration(s) to a wall or ceiling mounted consolidation Pull Box method for all backbone and horizontal cable runs. Power conduit shall be its own pathway and penetration. See **Communication System Standards Section 27 05 28 Communications Pathways** for further direction
 - Cabinet openings (door) shall be double flanged on all sides
 - Up to 4 permanent factory installed lifting eye bolts may be included with enclosures for field handling and placement



- All external hardware shall utilize non-corrosive material. Do not mix metal types on cabinet
- CABINET SIZING and USE
 - Cabinet sizing (single):
 - Min and max exterior height: 66"H – 72"H
 - Rack Units- Min and max unit: 31RU – 34RU
 - Min and max exterior widths: 27"W – 28"W
 - Min and max exterior depths: 30"D – 36"D
 - This standard and the cabinet depth listed is meant for smaller remote network switch gear. The MDC is meant to extend a communication room's reach, not replace a communication room's function. Engineer to consult with Port of Seattle Network Teams for any switch gear to be placed in cabinet to ensure specified gear, associated front (data), and rear (power) connections fit within specified cabinet.
 - (2) Doors: (1) front and (1) rear
 - SEE DETAIL 2.3.1.A (end of section)
 - Cabinet sizing (double):
 - Min and max exterior height: 66"H – 84"H
 - Rack Units- Min and max units: 31RU – 42RU
 - Min and max exterior widths: 52"W (typical of Port of Seattle/Tenant cabinet) up to 72"W (typical for shared Access Control cabinet)
 - Min and max exterior depths: 30"D – 36"D
 - This standard and the cabinet depth listed is meant for smaller remote network switch gear. The MDC is meant to extend a communication room's reach, not replace a communication room's function. Engineer to consult with Port of Seattle and Tenant (if applicable) Network Teams for any switch gear to be placed in cabinet to ensure specified gear, associated front (data), and rear (power) connections fit within specified cabinet.
 - (4) Doors: (2) front and (2) rear
 - Additional setup configuration for double cabinets:
 - Shared MDC; ACS and Port Network(s): RIGHT SIDE- Port Network comms with rack rail system per cabinet racking section below. CENTER- Build with support system capable of holding the necessary metal channel for rack rail assembly and ACS Wall field backplane. LEFT SIDE- ACS wall field mounted equipment with vertical metal channel attached to factory sidewall channel which shall hold a metal backplane or board for wall field mounting of gear and wire distribution on each side of backboard. Maintain a minimum of 1.5" clearance around all edges of backboard to allow for cable routing front to rear of backboard mounted equipment



- ACS wall field mounted equipment; typical:
 - (1) Power Supply 26"H 19"W 6"D
 - (1) CK732-A Box: 20"H 16"W 6"D
 - (1-4) ITB enclosures 16"H 12"W 6"D
 - ACS and Port Network cabinet grouping shall be set at max 72" exterior width for a double wide cabinet. To accommodate ACS wall field, ACS shall be no less than 44" and no more than 45" wide. This leaves the Port Network rack side at no less than 27" or no more than 28" wide. Engineer's drawings shall dictate chosen dimensions to best suit Port Network and ACS needs per build.
 - Cabinet door width note: The adjacent front and rear doors to be sized accordingly; ACS doors shall be larger to accommodate full access to internal wall field
 - SEE DETAIL 2.3.1.B (end of section)
- Shared MDC; TENANT and Port Network(s): RIGHT SIDE- Port Network comms with rack rail system per cabinet racking section below. CENTER- Solid center divider with (3) equally spaced 3" cable pass-thru holes at a min. 2-inch setback from face of cabinet both front and rear for a total of (6) pass-thru penetrations. Provide for cable edge protection with 3" bushing or grommet at all penetrations. LEFT SIDE- Tenant IT comms with rack rail system per Cabinet Racking (Rails) section below
 - SEE DETAIL 2.3.1.C (end of section)
- CABINET DOORS
 - Cabinet doors shall be front and rear full height solid overlapping access doors with the following:
 - Provided with three-point locking mechanism with duplex nylon rollers, top and bottom
 - Inward-turning handles with minimum provisions for padlocking; Padlock only handles shall not have keyed CH751, double bit, or square locks. Disable non-compliant lock if factory installed.
 - On cabinets with padlock handles: Project shall furnish and install Comm keyed (4-59) padlocks prior to punch list walk; coordinate delivery with Port of Seattle Lock Shop
 - Preference is for securing cabinet doors with spring loaded locks capable of accepting a Best 6 or 7 pin core. A 6 pin construction core (type Blue) shall be installed in each lock core and two standard keys included with each cabinet and delivered to the Engineer



- On cabinets with Best cores: Project shall coordinate with Port of Seattle Lock Shop for installation of Comm keyed (4-59) cores prior to punch list walk
 - All doors shall have one piece closed-cell neoprene door seal gasket
 - Two position door stop assembly if not part of hinge function
 - Hinge: (3) per door up to 56 inches, not to exceed 14 inches center to center. On doors greater than 56 inches; add hinges as necessary. Preference to door hinge that allow for door lift off (replacement) and built-in door stops
 - Door vents; Passive Ventilation
 - Air intake: Front door, bottom third of door, add a louvered inlet with filter to prevent dirt from entering with air flow.
 - Note: Typically Left/Front door on double cabinet
 - Filter
 - Filter Membrane: Hydrophobic ePTFE (Expanded polytetrafluoroethylene)
 - Operating Temperature: -40 to +149 Fahrenheit
 - Humidity Range: 0 to 100% Relative Humidity
 - Filtration Efficiency: >99.5% (at 0.1 µm, 1 cm/sec)
 - Flammability: UL 900 certified
 - Air exhaust (For non-hood or roof/soffit vented cabinets): Rear door, top third of door, add a louvered inlet with filter to prevent dirt from entering with air flow
 - On cabinets specified in contract to have active heat and air condition assemblies, add passive weather plates for all ventilation points
 - For active ventilation, refer to below details following Power Service to Cabinets
- CABINET RACKING (RAILS)
 - Furnish cabinets with internal 19-inch rack rails for mounting of equipment that are EIA-310-D compliant universal hole pattern and threaded #12-24 equipment mounting
 - Vertical hole spacing at 5/8" -5/8" -1/2". Rack rails to be depth adjustable, with rack rails both front and rear of cabinet
 - Side wall width for 19" rack rails shall be spaced off cabinet side walls by a minimum of 3.25" (deep strut) or (2) standard 1-5/8" (stacked strut) to allow for vertical cable wire management
 - Set rack rail depth (front and rear) to 6 inches from doors or interior edge of cabinet
 - Provide a minimum 2" wide vertical D-Ring cable managers spaced every 6 rack units top to bottom on each side of front rack rails (for comm cable mgmt.) and on each side of rear rack rail (power distribution on left and backbone cable mgmt. on right side)



- Each cabinet shall be furnished with (50) #12-24 screws (independent of any screws utilized for D-Ring configuration)
- POWER SERVICE to CABINETS
 - Note: Non-powered cabinets shall be approved on a case-by-case basis by the Telecom Design Review Team.
 - Passive (such fiber patching) MDC's shall still require power to facilitate necessary active environmental controls
 - Engineer shall design cabinet power electrical loads capable of supplying power for environmental controls, project specific network(s), and UPS powered equipment
 - Power into cabinet as per electrical engineer's drawings. Power receptacle placement is requested to be mounted to 3RU blank located in the back bottom half of cabinet; SEE DETAIL 2.3.1.A[B & C]
 - If present all UPS shall be sized and specified per engineers approved contract documents
 - Rack mounted power distribution unit(s) (PDU) to be installed in the rear of comm cabinet and positioned in the bottom third of cabinet; SEE DETAIL 2.3.1.A[B & C]
 - LED light strip shall be provided for cabinet lighting. Light strip shall be approximately 12 inches long, have a minimum output of 320 lumens, and have a color temperature of 4100K (cool white) or higher. Light strip shall be ceiling mounted and oriented parallel to the front and rear door faces. Lighting shall not interfere with the proper operation of any other ceiling or shelf mounted equipment. All lighting fixtures shall energize automatically when any door is opened. Each door switch shall be labeled "Light"
 - Cabinet Temperature Regulations
 - Thermostats mounted to 4RU blank located in the front bottom half of cabinet; SEE DETAIL 2.3.1.A[B & C]
 - Ventilation (Active)
 - Add fan to the exhaust hood of cabinet or door -rear/ top. Final location to be determined per cabinet manufacture options and engineer's drawings
 - Temperature controlled fans (top and bottom temperature activation at 40° to 95°)
 - Environmental controls; HVAC
 - Active environmental control product shall be sized to maintain a range of 40° min. to 95° max.; refer to engineer's drawings.
 - Grounding and bonding:
 - Remote cabinets shall bond to earth locally with a ground rod
 - Cabinets near building, such as ramp areas of the AOA shall be grounded to media source Equipment Room grounding bus bar
- CABINET MOUNTING



- For cabinets in field, not on AOA Ramp, the NEMA Type 3R pad mount cabinet shall drain to a sump and through a min. 3/8" diameter drain pipe to grade
- Preferred conduit entry is from adjacent placed underground vault, plan for base conduit entry to extend a minimum of 2" above finished pad level. Ground entry conduit shall be placed at rear quarter of cabinet; See **Communication System Standards Section 27 05 28 Communications Pathways** for further direction
- Typical service pad shall be no less than 3" above finished grade.
- Pad shall be a steel rebar reinforced level concrete service pad and extend no less than 2 inches beyond cabinet width and depth and no greater than 6 inches.
- Cabinets shall be installed level and be provided with a rubber gasket with silicon caulking to prevent moisture, dust, and debris from entering between the bottom of the cabinet and service pad.
- Secure cabinet to pad with amount of and size of anchor bolts as specified in engineer's drawings
- Protect all cabinets from impacts from vehicles or other large equipment strikes with a minimum of 6" bollards at each exposed corner of cabinet. Secure bollards as specified by engineer's drawings
 - Bollard placement shall ensure full door operation and access of equipment and staff
- ATTENTION ENGINEER/DESIGNER: In drawings, details, and/or any other communications to contractor: No field penetrations allowed on top of cabinets. Cabinet entry is allowed either from below or minimal side penetrations; SEE DETAIL 2.3.1.A[B & C]



- DRAWING DETAILS
 - DETAIL 2.3.1.A (Cabinet -single):

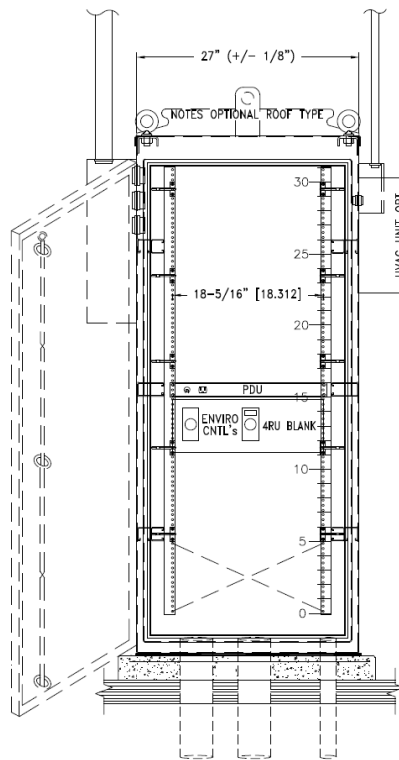
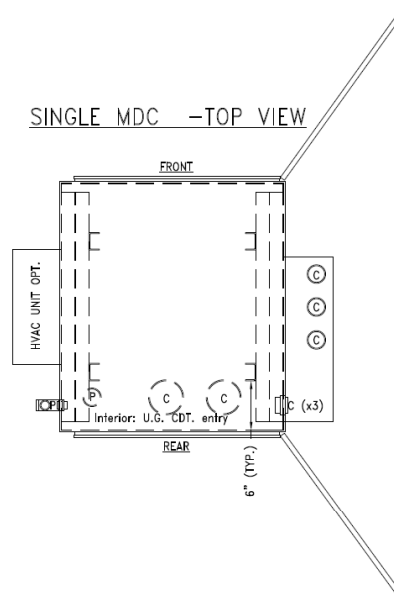
Notes:

1. All example dimensions represent minimums allowed
2. Example shows both conduit entry options into a MDC; underground and overhead

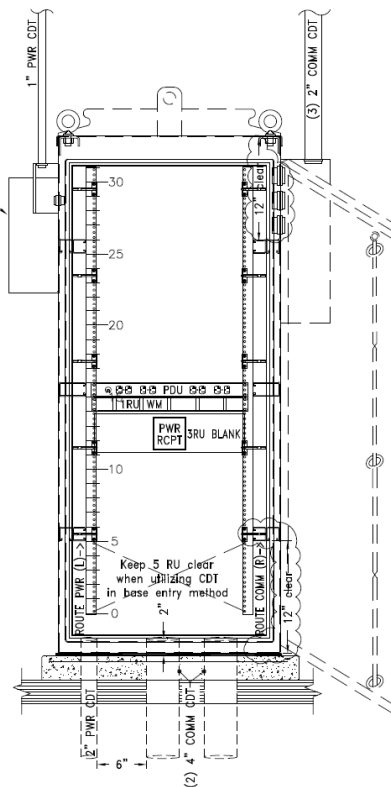
CONDUITS

P= Power
C= COMM

SINGLE MDC -TOP VIEW



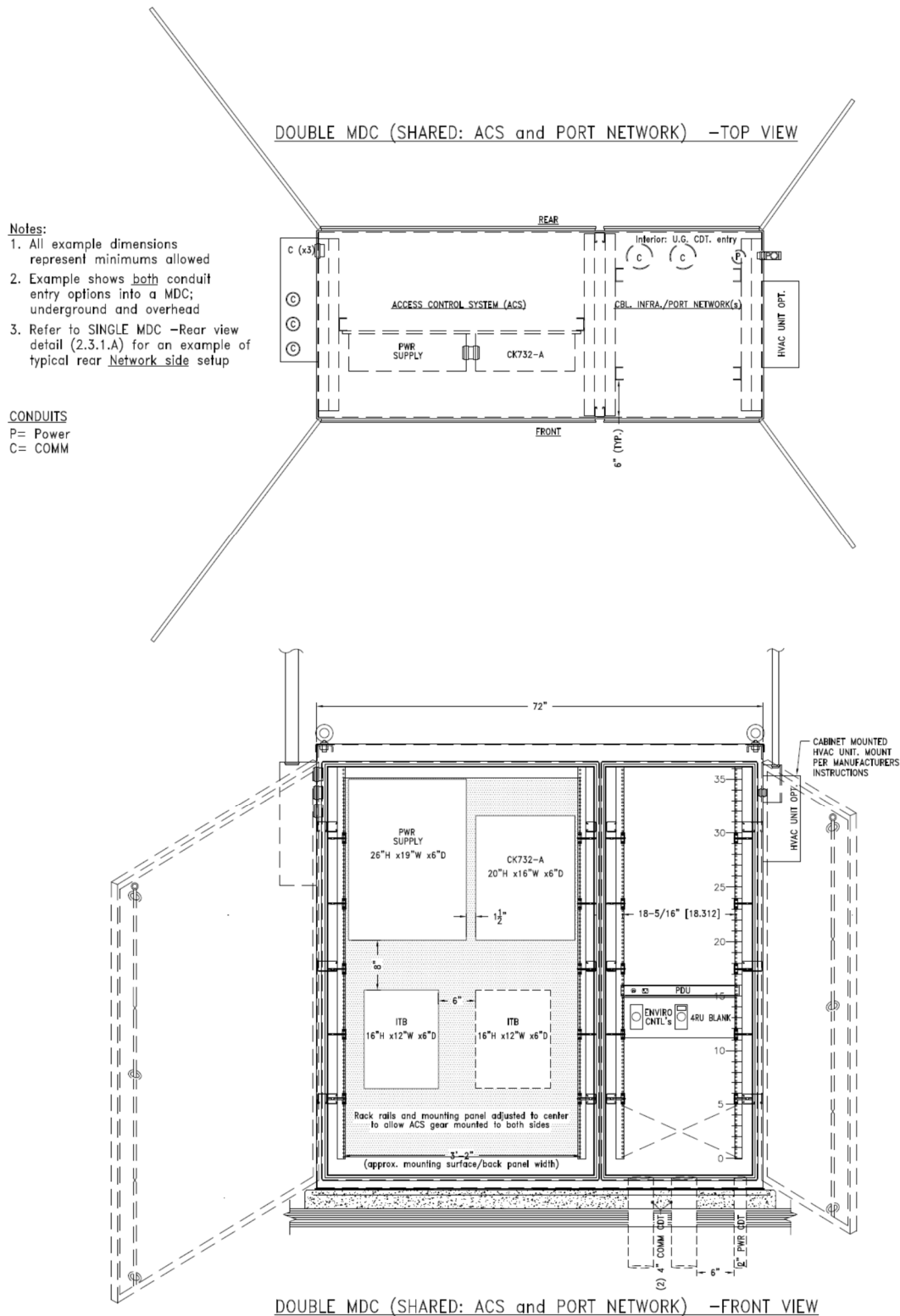
SINGLE MDC -FRONT VIEW



SINGLE MDC -REAR VIEW



○ DETAIL 2.3.1.B (Cabinet -double; Shared MDC for ACS and Port Network):



○ DETAIL 2.3.1.C (Cabinet -double; Shared MDC for Tenant and Port Network):



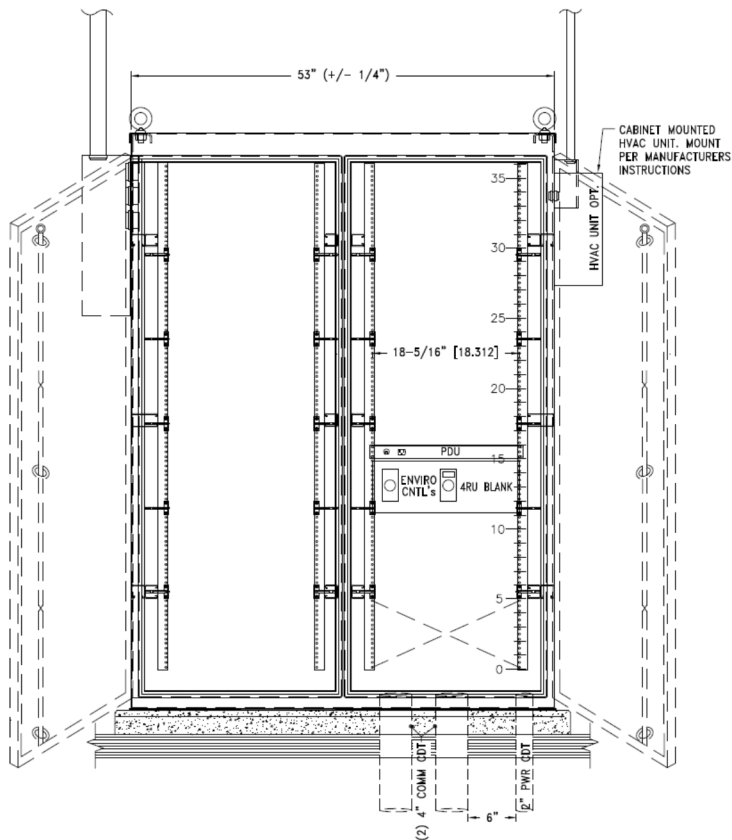
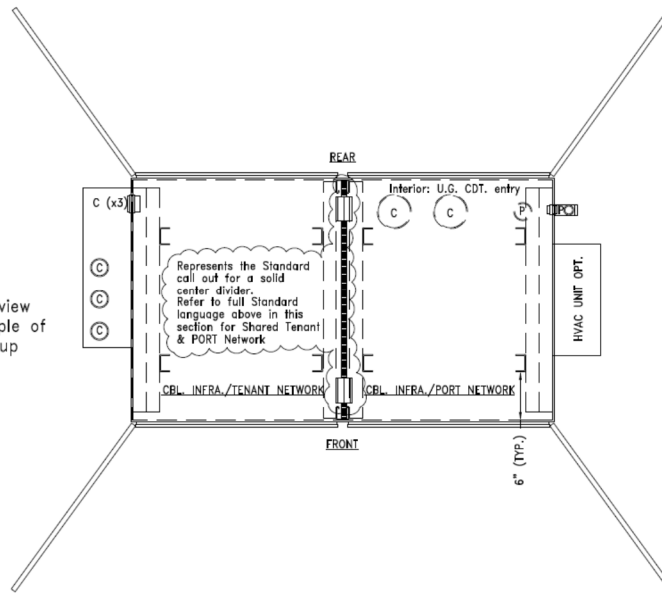
DOUBLE MDC (SHARED: TENANT and PORT NETWORK) -TOP VIEW

Notes:

1. All example dimensions represent minimums allowed
2. Example shows both conduit entry options into a MDC; underground and overhead
3. Refer to SINGLE MDC -Rear view detail (2.3.1.A) for an example of typical rear Network side setup

CONDUITS

P= Power
C= COMM



DOUBLE MDC (SHARED: TENANT and PORT NETWORK) -FRONT VIEW

