#### **CABLING REQUIREMENTS**

#### **Cable Demolition**

If cable removal/demolition is requested. Each cable will be identified in the MDF and removed out to the workstation. Location cabling, faceplates and jacks will be removed and recycled/discarded.

#### Cable Installation

#### Cable Support:

- Cable support pathway will be an independent system supported using J-hooks, beam clamps, conduit, etc.
- During the cable installation above the ceiling, ensure that cables are installed above fire-sprinkler systems and are not attached to the system or other ancillary equipment and hardware. The cable system and support hardware will be installed so that it does not obscure any valves, fire alarm conduit, boxes, or other control devices. At no time will cables be attached to the ceiling grid or lighting fixtures. Below the raised floor, mount J-Hooks to the floor pedestal along the pathway to support the cabling. Vendor will install and organize pathways and support systems such that when the support system is exited, room boundaries and right-angle routing will be used.
- Cables will be neatly dressed into the "BoxOne" cabinet or deemed termination point.

#### Typical Outlet:

- A Kiosk Sales Workstation outlet will contain five (5) Category 6 cables.
  - a. Five (5) Cat6 Grey Cables are designated for the data.
- A Sales Counter Workstation outlet will contain four (4) Category 6 cables.
  - a. Four (4) Cat6 Grey Cables are designated for the data.
- A Office Workstation outlet will contain three (3) Category 6 cables.
  - a. Three (3) Cat6 Grey Cables are designated for data.
- A Printer/Fax (MFP) station outlet will contain two (2) Category 6 cables.
  - a. One (1) Cat6 Grey Cable is designated for data.
  - b. One (1) Cat6 Grey Cable is designated for voice.
- ► A Printer Station outlet will contain Two (2) Category 6 cables.
  - a. Two (2) Cat6 Grey Cable is designated for data.
- A TV and each Access Point location will have One (1) Category 6 Grey cable.
- Cables will be terminated on a vendor provided Keystone Patch Panel and Blue Keystone Inserts that will be mounted within the "BoxOne" enclosure.
- Cables will be dressed neatly using Velcro straps within the TR and inside of the "BoxOne" enclosure. Tie wraps are not permitted.
- ► All Cabling will be Grey. Analog/Fax Line will have White Jacks.
- All cables are to be terminated using Cat6 Jacks and housed in a Wall Plate or Biscuit Box. There are to be no RJ45 ends used to terminate cables.
- ► NOTE: All photos are older photos with incorrect color cable. All cabling will be Grey moving forward.



FIGURE 1 - PREFERRED LABELING EXAMPLES

#### 1.1.1 Termination and Testing:

- Cables will be terminated using the TIA/EIA 568B standard and tested using a standard cabling tester.
- All cabling terminated on Modular Inserts will be tested end to end and documented for compliance at all frequencies up to and including 250 MHz for Category 6.
- Testing will comply with the procedures and standards outlined by the cable manufacturer and ANSI/TIA-568-C.2 concerning testing of cable plant. Provide the following test result data:
  - a. Wire Map
  - b. Length
  - c. Insertion Loss
  - d. NEXT Loss
  - e. PS NEXT Loss
  - f. ACR-F Loss
  - g. PS ACR-F Loss
  - h. Return Loss
  - i. Propagation Delay
  - j. Delay Skew

- A Fluke DTX 1800 cable analyzer, or equivalent, will be used for Enhanced-performance testing to ensure that cables are defect free.
- Test results will be provided electronically.

#### Cable/Patch Panel Labeling:

- All cables will be labeled using machine generated wrap-around labels. Hand written labels are not permitted.
- ► All Faceplates and Surface Mount Boxes are to be Labeled matching the Cabling Labels.
- If site has a 24 Port Switch but a 48 Port Patch Panel, please use the 24 Port Patch Panel diagram
- ► Labeling Scheme: (A01, A02) A=Patch Panel 01=Port
- Only Access points to be punched down on ports highlighted red. Start the rest of the punch downs on port 4. This goes for all patch panels in a BoxOne not just acquisitions (due to the way we configure our switches by default).

	24 Port Patch Panel																						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

	48 Port Patch Panel																						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

Typical "BoxOne" Cabinet Installation

- Verify package was not damaged during shipping. If visible damage is found, notify SiteOne team before proceeding.
- Unbox "BoxOne" cabinet and prepare for installation.
- Remove packing materials and inventory contents.



FIGURE 2 - SAMPLE BOXONE CABINET

- Cabinet will be mounted to a wall using a 4'x4'x ¾" plywood backboard securely mounted to the wall 36" AFF, mounting hardware for the plywood should be capable of holding a minimum of 150lbs.
- Remove rear section of cabinet and mount centered to plywood backboard 48" AFF to the base of the cabinet using appropriate mounting hardware. Mounting hardware for the cabinet should be capable of holding a minimum of 150lbs.



#### FIGURE 3 - PRINCIPAL COMPONENTS OF THE BOXONE CABINET





FIGURE 4 - (LEFT) 4U VERTICAL WALL MOUNT, AND (RIGHT) 12UNEMA 12 SWITCH-DEPTH WALL-MOUNT RACK ENCLOSURE CABINET



FIGURE 5 - (FRONT VIEW) CABLES DRESSED NEATLY WITHIN CABINET USING VELCRO STRAPS WITH ADEQUATE SERVICE LOOP TO OPEN AND ACCESS CABINET.

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FIGURE 6 - (REAR VIEW) CABLES DRESSED NEATLY WITHIN CABINET USING VELCRO STRAPS WITH ADEQUATE SERVICE LOOP TO OPEN AND ACCESS CABINET.

#### Modem Installation

- Modem is to be extended/installed into the "BoxOne" rack on the shelf designated for Modem 1 and plugged into power on that shelf.
- ► Do not disconnect current connection from existing network, SiteOne personnel will complete this task.
- Switches or Routers can be temporarily placed either on modem 2 shelf or on top of the rack (if there is no room).
- DO NOT permanently mount/install any equipment into the rack other than what is already in place (other than placing the modem on modem 1 shelf).



FIGURE 7 - MODEM INSTALLATION

#### Cellular Modem:

- The MG51E will be powered by the Meraki Switch 01. Connect the MG51E to Port 23 on a 24 Port Switch or Port 47 on a 48 Port Switch.
- MG51E is to be installed on the inside of an External Wall of the business. This installation should be where the device is visible therefore it should not be in an Attic or Crawl Space area. Run a network drop from the MG51E

location to the BoxOne location and terminate it on the Patch Panel. This cable will be the uplink to the Switch Port described above.

• Plug the installed Patch Cable to the MG51E's PoE port.



- Confirm you see lights on the MG51E (Letting you know that it's powering up).
- Make sure the MG51E settles on a solid purple light.
- If the light is orange, reboot the MG51E by removing the Patch Cord to the Switch Port.
- If the light is flashing white, that is a good sign and means the firmware is updating. If it ends up orange after this, reboot it.
- Call SiteOne IT if device remains with an orange LED. The SIM card may need to be replaced or activated.
- > Perform a survey on the Verizon signal coverage to determine what type of antenna is necessary.
  - Perform the survey with the Branch personnel to determine the upload and download speed onsite.
  - $\circ$   $\;$  Ensure that we have the same signal coverage inside and outside the location.
  - If the site does not have sufficient signal coverage inside, contact Network Support to have an External Antenna array ordered.
  - Please contact the Project Manager immediately
  - Even if an external antenna is required, the MG51E is to remain installed on the inside of an External Wall and not inside the BoxOne. NEVER INSTALL THE MG51E INSIDE THE BOXONE!

#### Wireless Access Point device (WAP):

 Device is to be mounted in a centralized location designated by SiteOne IT. DO NOT MOUNT NEAR OR INSIDE THE BOXONE!



Follow these steps to mount the access point below a suspended ceiling.

- Step 1 Decide where you want to mount the access point on your suspended ceiling.
- Step 2 Open the ceiling grid clip completely.
- Step 3 Place the ceiling grid clip over the T-rail and close it to the appropriate detent (A, B, or C).
- Step 4 Use a screwdriver to tighten the two-ceiling grid clip locking screws to prevent the clip from sliding along the T-rail.
- Step 5 Observe the ceiling grid clip width detent letter (A, B, or C) that corresponds to the T-rail width.
- Step 6 Align the corresponding holes (A, B, or C) on the mounting bracket over the mounting holes on the ceiling grid clip.
- Step 7 Hold the mounting bracket and insert a 6-32 x 1/4 in. screw into each of the four corresponding holes (A, B, or C) and tighten.
- Step 8 If necessary, drill or cut a cable access hole in the ceiling tile for the Cat6 cable. Pull the cable through the access hole until you have about 1 foot of cable protruding from the hole.
- Step 9 Connect the Cat6 cable to the access point.
- Step 10 Align the access point feet over the keyhole mounting slots on the mounting bracket. If you created a hole for the cable, make sure the access point is positioned so that the cable reaches its port.
- Step 11 Gently slide the access point onto the mounting bracket until it clicks into place.

#### Example Floor Plan (Site Walkthrough Required)

**Documentation Requirements** 

Project Close Out Documentation Required

Required Close Out Documentation:

- Printed Test Results
- □ As-Built Floor Plan
- Picture of mounted rack in specified location (with cable bundle going into rack in view)
- □ Picture of mounted Antenna(s) (if necessary)
- □ Picture of mounted AP(s) in specified location
- □ Pictures of cable management at the patch panel (Front and Back)
- □ Pictures of any surface run cable (going through Raceway)
- □ Completed daily reports