



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO
Steve Poftak, General Manager



DESIGN DIRECTIVE

To: Distribution

From: Erik Stoothoff, P.E.
Chief Engineer

Date: November 19, 2019

RE: Customer Assistance Area and Call Box Design Directive

This design directive is intended to consolidate, reiterate, supplement, and clarify the MBTA's approach, preferences, and requirements for Customer Assistance Areas (CAAs), Call-Boxes and Call-Box illumination on the MBTA system.

In the event that conditions warrant deviation from this directive, a design waiver signed by the Chief Engineer and the department owning the scope of work will be required of the project.

Design Consultants shall design to standards as prescribed by Code. MBTA Standards shall apply only where Code does not address a topic or the MBTA requires a standard above and beyond Code. The more stringent shall always apply.

DEFINITION

A Customer Assistance Area is a designated space on a station platform where customers can safely request and wait for assistance.

CODES AND STANDARDS

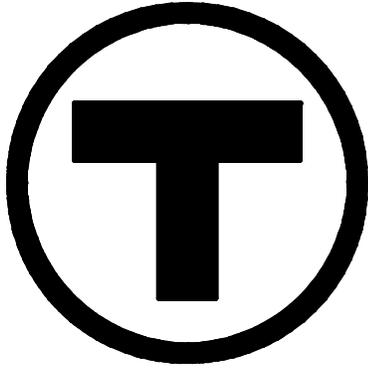
MBTA Contract Specifications for Customer Assistance Area Improvements: Red, Orange, Blue and Green Lines (Appendix A).

DESIGN PRINCIPLES

All new platforms and platform renovations shall be designed with Customer Assistance Areas in accordance with the CAA specifications provided in Appendix A. All Call-Boxes shall conform to the provisions within the CAA specifications provided in Appendix A. Call-Boxes shall be equipped with constantly illuminated blue lights in accordance with the CAA specifications provided in Appendix A.

Appendix A

MBTA Contract Specifications for Customer Assistance Area Improvements: Red, Orange, Blue and Green Lines



**MASSACHUSETTS
BAY
TRANSPORTATION
AUTHORITY**

CONTRACT SPECIFICATIONS

For

**CUSTOMER ASSISTANCE AREA IMPROVEMENTS
RED, ORANGE, BLUE, AND GREEN LINES**

BOSTON, MASSACHUSETTS

May, 2016

Introduction

The Customer Assistance Area (CAA) is a designated space on a station platform where customers can safely request and wait for assistance. The concept of the CAA was developed in 2012 based on feedback from customers who shared that they often did not know how to effectively request assistance boarding/exiting a train if station personnel were not available. Although the CAA is designed as an accessible space for customers with disabilities, all customers are welcome to utilize the CAA.

Each CAA is comprised of seven key features:

- **Call box:** Customers can utilize call boxes to request assistance or report an emergency. Calls for assistance are received by local Hub Stations whereas emergency calls are directed to Transit Police.
- **Increased lighting:** Lighting within the CAA is increased by 20% to allow for increased safety and greater visibility for both customers and employees responding requests for assistance.
- **Blue indication light:** A blue jelly jar light is installed above the call box to increase the visibility of the CAA.
- **Bridgeplate:** CAAs are equipped with a portable bridgeplate to allow for easier access for staff.
- **Directional Tactile:** White directional tactile indicators are installed on each side of the CAA to allow for cane detection.
- **Signage:** Consists of four sign types (visual and tactile Braille) that identify the area and provide CAA and station information in an accessible format.
- **Benches:** Each CAA is equipped with a backed bench or flat bench adjacent to a wall that provides back support.

Criteria for CAA Placement

The placement of the CAA is important to the success of the initiative. It is critical the CAAs be in locations that are safe, accessible, visible and consistently placed across platforms. CAAs should be placed as close to the center of the platform as possible. The purpose of the CAAs centralized location is to limit the distance a customer must travel to/from the CAA. It is also avoids having a customer wait at the ends of the platform which are generally less populated.

However, certain environmental factors may not allow for the placement of a CAA at the center of a platform. For example, stairways, columns, and other obstacles make the location unpractical. In this situation, CAAs should be placed as close to the center of the platform but towards the Motorperson's cab (i.e. between the 2nd and 3rd car).

- **Heavy Rail**
 - A Customer Assistance Area must not be located in an area of a platform that lines up in a perpendicular fashion with the coupler of a heavy rail vehicle.

- The placement of a CAA shall line up with a door on either the second car or third car from the head end of a train consist.
 - It is critical that the CAA NOT be placed in an area that lines up in between cars
 - CAA must not be located in an area of the platform that is secluded from other passengers or is far from an elevator or escalator.
 - Placement must not block the egress of walkways or doorways.
 - CAA's must be free of fire hydrants.
 - Support columns that are adjacent to the tracks must not exist within the confines of a CAA as denoted by the directional tactile. Support columns protruding out from walls may be present within the confines of a CAA as long as its presence does not physically separate CAA assets.
- **Light Rail**
 - A Customer Assistance Area must not be located in an area of a platform that lines up in a perpendicular fashion with the coupler of a light rail vehicle.
 - The placement of a CAA shall line up with the second door on the first car of a train consist.
 - It is critical that the CAA NOT be placed in an area that lines up in between cars
 - CAA must not be located in an area of the platform that is secluded from other passengers or is far from an elevator or escalator.
 - Placement must not block the egress of walkways or doorways.
 - CAA's must be free of fire hydrants.
 - Support columns that are adjacent to the tracks must not exist within the confines of a CAA as denoted by the directional tactile. Support columns protruding out from walls may be present within the confines of a CAA as long as its presence does not physically separate CAA assets.

PASSENGER ASSISTANCE – EMERGENCY CALLBOX SYSTEM

PART 1 – GENERAL

1.1 DESCRIPTION

- A.** This specification section covers the furnishing, installation, configuration, and testing of a passenger assistance callbox system at various locations throughout the project.
- B.** Contractor shall furnish and install security hardware devices, mounting brackets, power supplies, switches, controls, consoles, and other components of the system as shown and specified herein.
- C.** Also specified herein is the furnishing, installation, and testing of fully functional IP PoE Call Boxes and IP Desktop Master Stations that will be fully integrated in the VidSys System for camera call-up on the screen of the VidSys Client of the operator answering the phone. The MBTA currently has a Stentofon system and Alphacom server with spare capacity that is integrated into the Lenel and VidSys systems. The Contractor will add to the existing system, and configure the newly added IP PoE Call Boxes and IP Desktop Master Stations to facilitate the automatic camera call up of local CCTV Cameras on answering of the incoming call. The username logged into the IP Desktop Master Station and the VidSys clients will remain constant for ease of linking of call answer to VidSys client for camera call up.
- D.** Also furnish and install outlets, junction boxes, conduit, connectors, wiring, and other accessories necessary to complete the system installation. Requirements shall be in accordance with Division 16, Electrical.

1.2 SUBMITTALS

- A.** Prior to approval of the Passenger Assistance Emergency Callbox System hardware and software components, the Contractor must submit the proposed equipment vendors qualifications and the vendors acknowledgement of the hardware and software to be supplied will meet all functionality required within this specification. The Contractor and vendor shall be prepared to demonstrate the equipment functionality prior to approval. The Contractor shall submit a typical site block diagram indicating hardware and software components that shall be installed at all locations.
- B.** The Contractor shall have present during the duration of the Contract a certified network engineer with a minimum of five years experience in networking of large-scale wide area network projects to be involved in all aspects of system integration of networked devices. The Contractor must submit this key person's resume for approval by the MBTA within ten days from Notice to Proceed. No work shall be allowed to proceed with components having a network interface if this key person is not involved, this person shall be on-site at all times when network integration is taking place. Failure to have this person on-site shall cause the MBTA to immediately stop work until this person is on-site, at the Contractors expense. Shall this person no longer work for the Contractor, the Contractor shall immediately inform the MBTA and a replacement shall be submitted at that time.
- C.** Submit descriptive literature, including manufacturer specification sheets, for all Passenger Assistance Emergency Callbox System equipment, software functionality, and materials proposed for use in accordance with the requirements of this section for

approval prior to fabrication, assembly, installation, and testing. Also submit the following to the Engineer for approval:

1. Block diagram of complete system, illustrating proposed configuration and interconnections of all system components.
- D.** Prior to ordering any equipment required under this section submit six (6) copies of the following to the Engineer for approval:
1. Full technical data and manufacturer cut sheets for all equipment.
 2. Site specific plans showing details of the following:
 - a. Passenger Assistance Emergency Callbox equipment locations and mounting details.
 - b. Cable and conduit details.
 3. Schematic and wiring diagrams complete with terminal numbers.
 4. Procedures for programming and troubleshooting.
 5. Full interconnect diagram for overall system, including interface connections to existing equipment.
- E.** Provide maintenance instruction manuals to the Engineer including information regarding installation and maintenance as follows:
1. Operational Description and Procedures
 2. Troubleshooting and Routine Test Procedures
 3. Adjustments and Alignment Procedures
 4. Wiring Diagrams, Tables and Schematics
- F.** Prior to installing any equipment, submit to the Engineer for approval six (6) copies of a detailed test procedure intended to ensure all components of the system are functioning properly, in accordance with these specifications and the contract drawings. The tests performed shall include, but not be limited to, the tests outlined in Paragraph 3.4 of this section. The detailed test procedure shall include a description of all test equipment to be used and specific measurements and/or pass/fail criteria for each test.
- G.** Factory Tests: Submit, at completion of factory testing, six (6) certified copies of test results.
- H.** Test Procedures and Reports: Full report details shall be submitted for the scheduled tests and the expected duration of all test procedures. All test report forms and details of the methods shall be approved before commencement of system testing to be furnished under this contract.
1. The test report shall identify the name of manufacturer, model numbers, serial numbers, and the last date of calibration of test instrumentation. Documentation shall be furnished to verify that test instruments have been calibrated not more

than nine months prior to the tests. If a test instrument does not require calibration, it must be highlighted in the report.

2. The test report shall include a list of attendees.
 3. Certified test results for the system components (All locations and 10 Park Plaza) tests shall be submitted within ten days after the completion of each test. No equipment shall be released for shipment until certified test data is approved by the Authority. Copies of approved test procedures, raw data measured results, calculations, and all data derived from tests shall be included as part of report. All test data shall be bound in one report. The test report shall be indexed and cross-referenced in an easily understood manner.
 4. Certificate of Compliance: Submit a certificate of compliance that all components furnished meet the requirements specified herein.
- I. Operation and Maintenance Manuals shall be submitted as listed below:
1. The Contractor shall furnish an operation and maintenance manual for each piece of equipment, unless otherwise specified herein. The manual shall be provided in both hardcopy and on compact disk. The MBTA Communications Department prior to submittal shall approve the Software utilized. The following identification shall be inscribed on the cover: the words "Operating and Maintenance Manual", the name and location of the project, the name of the Contractor, and the Contract number. The manual shall include the names, addresses, and telephone numbers of each subcontractor furnishing or installing equipment. The manual shall have a table of contents and index. The manual shall be assembled to conform to the table of contents, including tab sheets placed before instructions covering the subject. The instruction sheets shall be legible with large sheets of drawings folded in. The contents of the manual shall also be available on-line by means of a help screen. The final Operating and Maintenance manual shall also be submitted on CD.
 2. The Contractor shall submit to the Engineer for approval three copies of the preliminary operation and maintenance manual at least thirty days prior to shipment of the first relevant unit. After approval of the preliminary submittal, and having made all necessary corrections and amendments required, the Contractor shall provide the Engineer with six (6) additional copies of the approved dated operation and maintenance manuals. One master camera-ready copy shall be included as one of the six (6) copies to permit additional copies to be made. The master camera-ready copy shall be clearly marked as such on the outside. One manual shall be provided on CD. The MBTA Communications Department prior to submittal shall approve the software utilized. The manual shall provide a clear explanation of the theory, operation, and maintenance of the equipment accompanied by photos and schematic, wiring, and mechanical assembly diagrams, as required. The manual shall be indexed and cross-referenced in an easily understood manner. The manual shall be loose leak bound and shall include, but not necessarily be limited to, the following information:
 - a. Operating instructions.
 - b. Troubleshooting and fault isolation procedures for on-site level repair.

- c. System equipment removal and replacement procedures.
- d. A list of the replaceable components.
- e. A test procedure to verify the adequacy of repair work.
- f. A preventative maintenance schedule and instructions for the replacement of any electrical equipment.
- g. A preventative maintenance schedule for inspection, removal, and replacement for each component.
- h. A list of special tools provided by the manufacturer.
- i. A list of recommended tools and test equipment required performing all maintenance tasks.
- j. Recommended spare parts list for one year's operation.
- k. Interchangeable parts list-showing parts common to items of equipment.
- l. Equipment manufacturer's descriptive literature including catalog cuts.
- m. As-built working drawings.
- n. System component approved factory test reports.
- o. The latest service bulletins with dates that describe service procedures.
- p. Full Operations Manual for Access Control System software.

1.3 REGULATORY REQUIREMENTS

- A. Comply with all applicable requirements of the following:
 1. National Electrical Code (NEC).
 2. Massachusetts Electrical Code (MEC).
 3. National Fire Protection Association (NFPA) 130.
 4. Telephone Industries Association (TIA).
 5. Institute of Electrical and Electronics Engineers (IEEE).
 6. Americans with Disabilities Act (ADA).
 7. Architectural Access Board (AAB).

1.4 RELATED SECTIONS

- A. Section 01010 SUMMARY OF WORK
- B. Section 16450 GROUNDING
- C. Section 16801 BASIC TECHNICAL REQUIREMENTS COMMUNICATIONS

- D. Section 16826 COMMUNICATIONS CABLE ROUTING SYSTEM
- E. Section 16876 COMMUNICATIONS GROUNDING OF EQUIPMENT
- F. Section 16898 COMMUNICATIONS SYSTEM TESTS

1.5 TECHNICAL REQUIREMENTS, PASSENGER ASSISTANCE EMERGENCY CALLBOX SYSTEM

A. General: The following information is provided to establish required system performance for the complete operating Passenger Assistance Emergency Callbox System. Some of the performance requirements noted herein are supported and supplied by existing systems in concert with new equipment and software which shall be provided by the Contractor under this scope of work. Contractor shall provide equipment, wiring, and software programming at sites as necessary to provide a complete functioning system as described herein and as shown on the drawings.

1. The Contractor shall ensure system additions and modifications provided under this scope of work have no negative effect on the existing systems and operations, and no permanent effect beyond that specified or implied by the scope of work unless noted herein.

B. Environment:

1. The Passenger Assistance Emergency Callbox System (PECS) is distributed throughout station facilities and shall also be fully integrated with the Authority's enterprise security system. Refer to the drawings and Bid Instructions to determine the scope limitations for this phase of work.
2. Central Administrative Post (Existing): The system server is located in Boston, Massachusetts. Primary system programming, configuration and control shall occur at this location.
3. Infrastructure and Connectivity
 - a. Local Sites and Stations: PECS controllers shall reside on the Authority's LAN/WAN network or network segment in each region. Coordinate with the Authority on the provision of LAN ports and network rights.
 - b. Enterprise: Local LAN networks will be connected to the Security Wide Area Network (SWAN), to establish PECS connectivity with the Operations Control Center (OCC). Coordinate with the Authority on the provision of IP addresses and network rights.

PART 2 – PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Furnish all items of the material, design, sizes and ratings shown on the Contract Drawings and herein specified.

- B. Install ADA accepted callbox equipment and install equipment to meet ADA and AAB requirements.
- C. Product Acceptability: The Products section contains lists of acceptable products. If product substitutions are proposed, they must be made based upon a comparison of equivalence to the product specified. Considerations may include but shall not be limited to functional, physical, aesthetic and/or interface aspects. The Authority shall be the sole judge of whether or not a submitted substitution is deemed to be “equivalent” to that specified.
- D. The Contractor shall provide all licenses necessary to provide the functionality described herein.

2.2 MATERIAL

- A. All material shall be new and unused and the workmanship shall be in accordance with the highest standards of the electronic equipment industry. Bids will be accepted only for new and current equipment. Equipment discontinued by the manufacturer will not be accepted. All components shall be UL listed.
- B. Equipment purchased under this section shall comply with applicable EIA standards and the manufacturer’s warranties against material and workmanship shall last for a minimum of one (1) year, following the acceptance by the MBTA.
- C. Provide equipment that meets all performance requirements when operating within the MBTA transit system environment, subject to temperature, electromagnetic interference, humidity, vibration, and light conditions typically encountered.

2.3 WIRE AND CABLE

- A. The Contractor shall provide wire and cable as specified or recommended by the manufacturer. Wiring shall meet NFPA 70 and NFPA 130 standards. CAT6 Cables and wiring shall be rated and approved for the intended use and environment. Cables and wires installed inside rigid galvanized steel conduit in stations and tunnels shall be low-smoke zero halogen and indoor and outdoor rated. RGS conduit should not be more than 30% filled with cables and wires. All CAT6 network cabling systems shall have EIA/TIA 568b standard termination and shall not exceed 100 meter or 300 feet in total cable length. Terminate Cables to a CAT 6 patch panel located in communication room. If cable runs exceed 300 ft then contractor shall consult with MBTA Communications Engineer for alternative solutions such as Ethernet Extenders or single mode fiber solution.

2.4 IP POE CALL BOX

- A. The Intercom Substation shall meet, or exceed, the following specifications:
 - 1. The IP PoE Call Box shall be wall mounted or flush mounted in stanchion unless otherwise noted.
 - 2. Wall mounted installation of IP PoE Call Box shall include back box, as provided or as recommended by, the intercom manufacturer.

3. Faceplate design shall be vandal resistant, corrosion resistant stainless steel construction.
4. Loudspeaker, microphone, call buttons and tamperproof fasteners shall be vandal resistant and composed of corrosion resistant materials.
5. The IP PoE Call Box front plate shall match that of the existing call boxes with dual buttons. One button shall read "PUSH FOR INFORMATION" and the other "PUSH FOR EMERGENCY" to make it clear to the user what each button is used for. Each button shall call a different set of phones based on the MBTA protocols, coordinate calling and call sequencing with the MBTA.
6. Below the "PUSH FOR INFORMATION" button shall be matching Braille that reads, "INFORMATION". Below the "PUSH FOR EMERGENCY" button shall be matching Braille that reads, "EMERGENCY".
7. Programmable relay output for lock control or auxiliary device.
8. IP PoE Call Box shall connect using a RJ-45 10BASE-T/100BASE-TX PoE connector for signal and power requirements.
9. The IP PoE Call Box shall accept Power over Ethernet (PoE) IEEE 802.3af, Class 0, unless otherwise specified. Contractor shall provide a compatible PoE network switch, as required to power Ethernet devices.
10. The IP PoE Call Box shall be fully compatible with the existing Stentofon system.
11. Audio technology capabilities and features shall include:
 - a. Wideband 200 Hz – 7 kHz (G.722).
 - b. Telephony 3.4 kHz (G.711).
 - c. Speakerphone output: 1.5 watts.
 - d. Acoustic Echo Cancellation.
 - e. Open Duplex.
 - f. Adaptive Jitter Filter.
12. Advanced operational features shall include, and not limited to:
 - a. Network Supervision.
 - b. Voice over IP Statistics.
 - c. Centralized Monitoring.
 - d. Tone Test.
13. Installation features for intercom substation shall include:
 - a. Dual Ethernet Ports.

- b. Remote Software Upgrade.
- c. Centralized Provisioning.
- d. DHCP and Static IP settings.
- e. Integrated Web Server.
- f. Stanchions.

B. IP PoE Call Box shall be Stentofon CQ-110606-00 or approved equivalent.

2.5 CUSTOMER ASSISTANCE UNIT STANCHIONS

A. For outdoor/indoor locations where a suitable wall surface is not present for mounting a stanchion type housing is required per the following:

1. Dimensions (approximately) 6' H x 10" W x 8" D.
2. Wall thickness ¼" hot rolled steel.
3. Finish Blue powder coated.
4. Power rating (light) 120 VAC input/ 5-16 VDC (output).
5. "CUSTOMER ASSISTANCE" is to be silk-screened vertically, white lettering, on all four (4) sides. Silk screening shall be covered in protective clear coating.
6. Shall have a blue strobe light on top of unit with the following:
 - a. Weatherproof design.
 - b. Light to remain illuminated at all times.
 - c. Bulb Life (Constant on) 10,000 hours.
 - d. Bulb Power (Constant on) 14 Watts.
7. Stanchion is to be capable of housing two (2) loud speakers for local public address announcements or sirens.
8. Police Assistance Unit faceplate shall be illuminated for night-time use.
9. Station name and location shall be engraved lettering filled in black on the front of Stanchion, as approved by the Engineer.
10. Stanchion is to be weatherproof.

2.6 SPARE PARTS

A. As described in 01010 SUMMARY OF WORK.

PART 3 – EXECUTION

3.1 GENERAL

- A.** Installation of all Passenger Assistance Emergency Callbox System equipment and components shall be in accordance with NFPA 70, UL 681, UL 1037, UL 1076, manufacturer's recommendations, approved shop drawings, and as shown on the Contract Drawings.
- B.** All wiring shall be neatly installed and wire ways shall be utilized wherever possible. All wiring shall be identified at both ends by wire markers.
- C.** Furnish and install a complete and operable Passenger Assistance Emergency Callbox System.
- D.** Contractor responsible for system start-up, testing, and network testing.
- E.** Provide incidentals and appurtenances necessary to complete the work as specified herein and as shown on the Contract Drawings.
- F.** Complete as-built drawings for all work and verify that all drawings are accurate. One paper set to be provided for each Station Communication Room. One Mylar set for delivery to the Plan Room. One copy on CD in the latest version of AutoCAD to the project office.

3.2 INSTALLATION

- A.** The Contractor shall label each IP PoE Call Box with a label containing the following items, the Contractor shall submit an example label to the MBTA for approval prior to labeling IP PoE Call Boxes:
 - 1. "MBTA".
 - 2. The three letter location designation.
 - 3. The call box number from the Contract Drawings.
 - 4. The device ID.
 - 5. A QR code of the call box label information.
- B.** Clearance Requirements:
 - 1. 48" of clearance in front of the call box.
 - 2. 18" of clearance from center on both sides of the call box.
 - 3. Maximum 48" height from finished floor to highest operable part (button) on call box face.

3.3 SYSTEM CONFIGURATION

- A.** Configure the system to provide the following operation:

1. The new IP PoE Call Boxes and IP Desktop Master Stations shall be configured in the existing Stentofon Alphacom server and integrated into VidSys to be used for camera call up on the screen of the operator when they answer the call from the IP PoE Call Box.
2. The Contractor shall associate up to four CCTV cameras nearby the IP PoE Call Boxes so that they are automatically displayed on the VidSys Client of the answering operator. The Contractor shall select a layout that is appropriate to displaying the number of associated CCTV camera streams.
3. The IP PoE Call Boxes and IP Gateways will call different IP Master Stations based on the button pressed. If the call is not answered after a specified number of rings, the IP PoE Call Box or IP Gateway will call another IP Master Station. The dialed IP Master Stations and call sequencing is based on MBTA protocols for different button presses and call box types. Coordinate IP Master Stations called and call sequencing with the MBTA.

3.4 TESTING

- A. Testing shall be performed in accordance with the requirements of Specification 16898 and as described herein.
- B. Conduct electrical tests to demonstrate compliance with this Specification and with manufacturer's recommended test procedures as approved by the MBTA Communications Engineer.
- C. The Contractor shall supply all test equipment and software for all system tests.

PART 4 – MEASUREMENT AND PAYMENT

4.1 GENERAL

- A. No separate measurement or payment will be made for work required under this Section. All costs in connection therewith shall be included in the Contract Lump Sum price.

END OF SECTION

ELECTRICAL (Lighting)

PART 1 – GENERAL

1.1 DESCRIPTION

- A.** This specification section covers the furnishing and installation of area lighting at various locations throughout the project.
- B.** For illuminating the CAA area the foot candle level should be increased in order to draw attention to the area. Typically, the use of an additional fixture is suitable at an increase of 10fc-15fc, which visually distinguishable without exceeding the 3:1 contrast ratio from the adjacent areas. It must be noted that this needs to be field verified as being suitable for the location in question.

PART 2 – PRODUCTS

2.1 GENERAL

- A.** All designs and materials must comply with all applicable requirements of the following:
 - 1. National Electrical Code (NEC).
 - 2. Massachusetts Electrical Code (MEC).
 - 3. National Fire Protection Association (NFPA) 130.
 - 4. Telephone Industries Association (TIA).
 - 5. Institute of Electrical and Electronics Engineers (IEEE).
 - 6. Americans with Disabilities Act (ADA).
 - 7. Architectural Access Board (AAB).
- B.** All designs and materials must also comply with Section 150504 Design Lighting Levels and Fixtures Directive as attached in the appendix.

PART 3 - EXECUTION

3.1 GENERAL

- A.** Installation of material must comply with the guidance from Electrical (Lighting) Part 1 Section 1.1 A and B.
- B.** All lighting installations must be inspected and accepted by the MBTA Electrical Inspector within the Power Department.

END OF SECTION

ELECTRICAL (Blue Indication Light)

PART 1 – GENERAL

1.1 DESCRIPTION

- A.** This specification section covers the furnishing and installation of blue indication lights at various locations throughout the project.
- B.** Blue indication lights are to be designed and installed for twenty-four hour a day solid illumination.

PART 2 – PRODUCTS

2.1 GENERAL

- A.** Provide a blue 24VDC LED Vandal Resistant Blue Marker Light, part number LEDTronics, Inc. 25mm Edison Screw based blue lamp (8 tier Beacon), part #BBL508-05-01, or equivalent, with a stone guard mounted on steel mast above call box, as described in Part 3 Execution. Power for the 24VDC LED light shall use utility power. Where it is impractical or logistically impossible to use a 24VDC Lamp the contractor needs to provide a suitable replacement approved by the Authority that will utilize available utility power.

PART 3 - EXECUTION

3.1 GENERAL

- A.** Side Platform – The application of blue indication lights on side platforms requires a total of one (1) blue light.
- B.** Center Platform – The application of blue indication lights on center platforms requires a total of two (2) blue lights.
- C.** A call box kiosk equipped with a blue indication light does not require the installation of additional blue indication lights.
- D.** Blue indication light must not be installed directly next to signage, support columns, and/or any similar type of object that would obstruct the line of sight from the platform.
- E.** Blue indication lights must not be placed within the confines of the wayfinding band, signage, and/or artwork.

3.2 INSTALLATION

A. Side Platform

- 1.** The blue indication light must be mounted at a minimum height of 80 inches but not higher than 120 inches above the finished floor.

2. Placement of the blue indication light must be within 12 inches to the right or left from the centerline above the call box.

B. Center Platform

1. The blue indication lights must be mounted at a minimum height of 80 inches but not higher than 120 inches above the finished floor.
2. One (1) blue indication light shall be mounted on the closest surface, relative to the call box, facing the tracks each side of the platform.

END OF SECTION

BRIDGE PLATE

PART 1 – GENERAL

1.1 GENERAL

- A. This specification section covers the furnishing and installation of bridge plates at various locations throughout the project.
- B. Meets and/or exceeds the ADA guidelines of bridge plates.

PART 2 – PRODUCTS

2.1 MATERIALS

The bridge plate shall contain the following standard requirements:

- A. Plate dimensions are 26-½” Long x 31-¾” Wide x ¼” thick.
- B. Minimum length and width required are 26” and 30”, respectively.
- C. The barriers to prevent wheels from slipping off are 2-¼” tall.
- D. The bridge plates should be constructed from ¼” thick serrated aluminum plates.
- E. The serrated surface will act a slip resistant.
- F. The ultimate strength of the material used was 23,000 psi.
- G. Designed for 300 lbs minimum with a safety factor of at least 3 (900 lbs).
- H. The slope of the plate is 1:2 (rise/run).
- I. The plate was designed to be stored vertically on platforms or trains.

The following formula was used to determine the stress applied to the plate.

$$\sigma = \frac{F}{A}$$

where σ = Stress (psi), F = Force (lbs) and A = wheel contact Area (in²).

$$\text{Total Stress applied: } \sigma = \frac{900 \text{ lbs}}{1.0 \text{ in}^2} = 900.0 \text{ psi}$$

$$\text{Stress applied per wheel: } \sigma = \frac{900 \text{ psi}}{2} = 450.0 \text{ psi}$$

The stress required to cause deformation in the plate is approximately 20,000 psi. The total force applied by the wheelchair to the plate will not be an issue.

Additional Features:

- A. An oval hole will be cut out of the plate from where it should be mounted.

- B.** Rubber surface on the bottom to prevent it from moving.
- C.** A u-shape fixture made from 1" wide stock welded on the bottom to minimize the travel distance in case the bridge plate moves.
- D.** See drawing number S-0704-02 for more details of design.

PART 3 - EXECUTION

3.1 Installation

- A.** Install one (1) bridge plate for each individual CAA. Note: only one (1) bridge plate is needed for a center platform located CAA.
- B.** Preferably install bridge plate within confines of CAA; however, when space is limited the bridge plate can be placed above the tactile or within a three foot distance of the CAA.
- C.** Bridge plate must be installed vertically against wall or flat surface so that the bottom edge touches or hovers no more than three inches off the finished floor.
- D.** Install a bridge plate mounting device that holds the bridge plate against the wall or flat surface and locks the asset in place with a p-key padlock (supplied by MBTA Key Room).
- E.** The installation must be flush against a wall or flat surface and cannot have edges protruding in a path of travel.

END OF SECTION

COMPOSITE DIRECTIONAL BAR TILE

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This document describes in detail the specifications for Composite Directional Bar Tiles- acceptable material used dimensions, ASTM compliance, and ADA compliance.
- B. This document outlines necessary testing, submittals, and specifications for Directional Bar Tiles.

1.2 SUBMITTALS

- A. Samples for verification purposes: submit two (2) Directional Bar Tile samples 12” x 12” of the kind proposed for use. Samples need to be properly labeled and contain the following information: Name of manufacturer, catalogue number and name of vendor with contact information if different from manufacturer.
- B. Shop Drawings: submit standard manufacturer shop drawings showing all pertinent characteristics of the Directional Bar Tile including but not limited to profile, fastener locations, dimensions/placement of directional bars and installation methods.
- C. Material Test Reports: submit current test reports from qualified, accredited independent testing laboratory in accordance with ASTM guidelines and indication that materials for use are in compliance with ASTM guidelines and indicating that materials proposed for use are in compliance with specification requirements and meet the properties indicated. All test reports submitted shall be representative of the Directional Bar Tile proposed.
 - 1. Physical Characteristics Testing Criteria must meet or exceed the following:
 - a. Water Absorption: not to exceed 0.20% when tested in accordance with ASTM-D570.
 - b. Slip Resistance: 0.80 minimum combined wet/dry static coefficient of friction when tested in accordance with ASTM-C1028.
 - c. Compressive Strength: 25,000 psi minimum, when tested in accordance with ASTM-D790.
 - d. Chemical Stain Resistance: No reaction to 1% hydrochloric acid, motor oil, soap solution, bleach, antifreeze, gum, and calcium chloride when tested in accordance with ASTM-D543.
 - e. Abrasion Resistance: 300 minimum, when tested in accordance with ASTM-C501.
 - f. Flame spread: 25 maximum, when tested in accordance with ASTM-E84.
 - g. Accelerated Weathering of Directional Bar Tile when tested by ASTM-G155 or ASTM-G151 shall exhibit the following results: Delta<5.0 at 2,000 hours minimum exposure.

- h. Adhesion Test: No delamination. Peel test-board failure in temperature range 20-180 degrees when tested in accordance with ASTM-C903.
- i. Salt and Spray Performance: No deterioration or other defects found after 200 hours of exposure, when tested in accordance with ASTM-B117.

PART 2 – PRODUCTS

2.1 GENERAL

- A. All materials bid/supplied shall be in accordance with this specification.

2.2 MATERIALS

- A. Directional Bar Tiles must be compliant with ADAAG and/or MAAB.
- B. Directional Bar Tiles must feature 11 3/8" long x 1 3/8" wide "directional bars" at 3" on center. Sixteen "directional bars" per tile.
- C. Directional Bar Tiles will have fastener countersink detail.
- D. Directional Bar Tiles will have a nonslip surface (see Section 1.2 C1 b).
- E. Directional Bar Tiles will measure 24" x 24" x 3/16" with two 1/2" deep flanges for concrete setting. Also have a ship lap detail.
- F. Directional Bar Tiles will be manufactured with a durable exterior grade homogeneous glass, carbon, and fiberglass reinforced composite material which is color fast and UV stable.
- G. Directional Bar Tiles will be WHITE and the color will be uniform throughout the tile and will not need to be painted nor will color change as worn.
- H. Directional Bar Tiles may be filed cut with typical saws.
- I. Directional Bar Tiles must comply with physical characteristics criteria described in Section 1.2 Submittals C1 a-k in this section of the Customer Assistance Area Standard.
- J. Directional Bar Tiles may be installed in a 1/4" recess or over an existing concrete substrate with field alterations consisting of suitable saw cuts with the use of Composite Sleeve Anchors, Adhesive and Sealant. (Flanges will be easily removed with typical saws).
 - 1. Composite Sleeve Anchors will be white composite sleeve anchor with stainless-steel nails 1/4" x 1 1/2".
 - a. Each tile ordered will be supplied with appropriate number of composite sleeve anchors and nails.
 - 2. Structural Moisture Cure Adhesive will be a multipurpose structural adhesive/sealant designed for bonding and sealing masonry, wood, glass, aluminum, and foam. It will be a tough elastic waterproof sealant and will conform

to ASTM-C920, CA Prop. 65. VOC Content: <20 grams/liter. Interior/Exterior application. Manufacturer approves application with tactile.

3. Sealant will be one-component, elastomeric, gun-grade, polyurethane sealant. Joint movement capability +/-35% (ASTM-C719). Color light gray or clear. Weather/Water resistant (Xenon Arc ASTM-C793, G26, and ASTM-C1247). Low VOC-43g/L or 0.36 lbs/gal. No shrinkage. Applicable for concrete, stone, brick, tile, glass, wood, and metal. Interior/Exterior application. Manufacturer approves application with tactile.
 - a. Each tile ordered will be supplied with appropriate number of tubes of sealant.

PART 3 – EXECUTION

3.1 GENERAL

- A. The number of Directional Bar Tile pieces requested in bid will be supplemented with the correct items/amounts described in 2.2 Materials J 1-3. Since amounts may vary with manufacturer, the numbers of these supplements are not specifically detailed in this bid; however, the bid must include a turnkey approach to all products necessary to install the number of tiles requested in the bid.
- B. The bid price shall include all delivery charges. The MBTA will accept delivery in three separate shipments to be determined by the Authority; however, the Authority will pay in total the bid price upon receipt of first delivery. The Authority will author paperwork to track and confirm receipt of materials and payment. Further, the Authority will share this documentation with the approved bidder. The Authority is the arbiter of this process and its decision is final.

3.2 INSTALLATION

NOTE: See Section general criteria for specific placement guidelines.

A. Side Platform

1. Install white directional tactile segments in a manner that borders the CAA with a total of two (2) segments each running perpendicular from the yellow detectable warnings.
2. The width between the outer white directional tactile segments must be a minimum of 12 feet and a maximum of 20 feet between the outer edges including the white directional tactile measurements. In the event that these conditions cannot be achieved, contact Design & Construction or System-Wide Accessibility for guidance.
3. White directional tactile abuts the yellow detectable warnings with the white directional bars running in a direction perpendicular to the yellow detectable warnings for a minimum length of twelve inches.

4. Create one (1) 48 inch gap in each white directional tactile segment. In the event that these conditions cannot be achieved, contact Design & Construction or System-Wide Accessibility for guidance.
5. White directional tactile segments must abut the finished wall and must protrude beyond any fixed station item (e.g. bench) within the CAA by 12 inches. In the event that these conditions cannot be achieved, contact Design & Construction or System-Wide Accessibility for guidance.

B. Center Platform

1. Install white directional tactile segments in a manner that borders the CAA with a total of two (2) segments each running perpendicular from one yellow detectable warning strip to the other yellow detectable warning strip across the platform.
2. The width between the outer white directional tactile segments must be a minimum of 12 feet and a maximum of 18 feet between the outer edges including the white directional tactile measurements. In the event that these conditions cannot be achieved, contact Design & Construction or System-Wide Accessibility for guidance.
3. White directional tactile abuts the yellow detectable warnings with the white directional bars running in a direction perpendicular to the yellow detectable warnings for a minimum length of twelve inches.
4. Create one (1) 48 inch gap in each white directional tactile segment. In the event that these conditions cannot be achieved, contact Design & Construction or System-Wide Accessibility for guidance.

END OF SECTION

AREA SIGNAGE

PART 1 – GENERAL

1.1 DESCRIPTION

- A.** Work included: This section specifies the design, fabrication, and installation of all designated ADA compliant signage as specified herein.

1.2 QUALITY ASSURANCE

- A.** Reference Standards: The work shall conform to the codes and standards of the following regulatory Agencies and Authorities as further cited herein:

1. ADA: Americans with Disabilities Act 2010 Standards.
2. ANSI: American National Standards Institute.
3. ASTM: American Society for Testing Materials, 1916 Race Street, Philadelphia, PA 19103 as published in "Compilation of ASTM Standards in Building Codes".
4. MAAB: Massachusetts Architectural Access Board.

- B.** Performance Requirements:

1. Painted sign finish shall comply with the following performance requirements:
 - a. Weatherability: When tested in accordance with ASTM G 154, after 500 hours in weatherometer (equivalent to approximately three years exterior exposure):
 - b. Gloss retention not less than 88.0 determined in accordance with ASTM D 523 at a 60 degree angle.
 - c. Color shall not change more than 1.68 units determined in accordance with ASTM D 2244 and measured with a Hunter Colorimeter, Model D25.
2. Durability: Sign finish shall not effect after repeated use of cleaners such as Graffiti Remover #1120 manufactured by Organics Corp., Lodi, NJ.

- C.** Source: For each type of material required for the work of this section, provide single-source responsibility.

- D.** Accessibility: The ADA 2010 Standards and the MAAB regulations are pertinent to the design and installation of items covered under the work of this section. When guidelines conflict, the guideline giving greater access shall be applicable.

- E.** Qualifications: The approved manufacturer shall have a minimum of five years of successful experience with similar work, and shall have a reputation for doing satisfactory work on time.

- F. Certification:** Submit manufacturer's certification that materials furnished comply with requirements specified.
- G. Maintenance Instructions:** Submit manufacturer's instructions for maintenance of tactile/Braille sign to the MBTA, including precautions for use of cleaning materials and solvents.
- H. Warranty:**
 - 1. Submit a written Manufacturer's warranty for MBTA acceptance, signed by the manufacturer, agreeing to repair or replace panels that fail during the specified warranty period. Failures include, but are not limited to, the following:
 - a. Coating degradation.
 - b. Chipping, chalking, fogging, or discoloration.
 - c. Fading.
 - 2. Warranty Period: One year from product ship date.

1.3 SUBMITTALS

- A. Product Data:** Manufacturer's product data, any limitations and recommendations for each material used, installation instructions, and manufacturer's certification (stating that materials comply with requirements) for the MBTA Design and Construction Department's review and approval.
- B. Samples for Approval:**
 - 1. Provide one full-size, complete sample of a representative sign, etched, painted, and finished for approval by the MBTA Design and Construction Department.
 - 2. ADA Compliance: Contractor shall complete the attached "ADA Tactile/Braille Metrics Checklist" to assure that all metrics of sample sign are in compliance with ADA defined metrics.
 - 3. Approval of sample sign is required from the MBTA Design and Construction Department Prior to final signage production.
 - 4. Sample will be resubmitted, if necessary, until it meets quality standards outlined in the Quality Assurance Section 1.2.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver work under this Section in a manner to prevent the cracking or stress of components, and to prevent mechanical damage or damage from the elements.**

PART 2 – PRODUCTS

2.1 SUPPLIED GRAPHICS

- A.** The MBTA Design and Construction Department will prepare and supply all digital sign graphics (physical size, layout, and content) in .eps format for etching. All graphic files are vector graphics, no font replacement is necessary.

2.2 CUSTOMER ASSISTANCE AREA SIGN

- A.** Sign dimensions: 14" x 24" with 2.5" text for signs mounted over 10', or 12" x 20" with 2" text for signs mounted below 10'.
- B.** Signage letters must be Helvetica Neue Bold, upper case, either 2" or 2.5" lettering.
- C.** Customized sizes are possible for necessary circumstances. Contact Design & Construction Wayfinding and Graphics for any non-standard size requirements.

2.3 BRIDGE PLATE SIGN

- D.** Sign dimensions are 10" x 20".
- E.** Signage letters must be 2 $\frac{5}{8}$ " Helvetica Condensed Upper Case-RGB: 0 124 195 blue with white background.
- F.** ISA symbol 7 $\frac{1}{2}$ ".

2.4 TACTILE BRAILLE SIGNS

- A.** Customer Assistance Area Sign
 - 1.** Sign dimensions are 10" x 11"
- B.** Station Identification and Line Direction Sign
 - 1.** Sign dimensions vary by station
- C.** Materials for Tactile Braille Signs
 - 1.** Zinc Signs: 0.125" one-piece zinc plate, utilizing chemical etch process to produce raised characters in compliance with ADA and supplied graphics. Chamfer or ease all sides and corners to remove sharp edges.
 - 2.** Attachments
 - a.** Mechanical: Threaded inserts appropriate to substrate material – four (4) per sign.
 - b.** Mechanical: Tamper resistant, $\frac{1}{4}$ " diameter stainless steel Flat Head Phillips Pin-Head screws. Screws shall seat into countersunk holes such

that when fully tightened the screw head is flush with sign background surface. Paint screws to match background paint color of sign.

- c. Mechanical: Non-metallic Washers – Provide rigid neoprene separators between fasteners and non-compatible materials to be joined.
- d. Adhesive: Where adhesive mounting techniques are specified, very high bond (VHB) tape specifically designed for compatibility with the base materials and the desired adhesive strength shall be used. All adhesives shall be tested on site. All adhesives shall be indicated in the shop drawings.
- e. Adhesive: Very high bond (VHB) tape shall be double coated acrylic foam tape as manufactured by the 3M Co., or approved equal.
- f. Adhesive: Surfaces on which signage is to be installed using adhesive shall be free of grease, oil, and/or any other residue.

3. Acceptable Manufacturers: the following is a partial list of zinc signage manufacturers:

- a. Vivid Manufacturing
- b. Dixie Graphics
- c. Kroy Sign Systems
- d. Etchcraft Incorporated
- e. Advance Corporation
- f. ADA Signs
- g. ASI
- h. ASE Manufacturing

D. Fabrication

1. Zinc Signs:

- a. Etching: Signs reverse-etched to create all tactile text, lines, arrows, and Braille glyphs raised 1/32" high. Braille glyphs shall be standard rounded grade 2 Braille as rendered in the EPS files. Cross section angle of raised characters shall not exceed 45 degrees. Text and Braille shall be finished to provide smooth, non-pointed edges. Background surface shall be smooth texture.

2. Finishes:

- a. Background - Mathews baked-on acrylic polyurethane enamel paint with eggshell/matte finish. Color shall match: Pantone 443 (Black).
- b. Foreground - (Tactile lettering only) brushed natural zinc with U.V. resistant clear urethane topcoat.
- c. Predrilled holes: Provide four ¼" counter sunk mounting holes, centered 3/8" from edges.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Customer Assistance Area Sign

1. Sign must be mounted at a height of 8'-9' above finished floor to the bottom of the sign. In the event that the sign cannot be mounted at the specified height, contact Design & Construction or System-Wide Accessibility for guidance. If sign is placed at a height of 10 feet or higher it requires lettering of 3 inches.
2. Sign must be placed on a finished wall, kiosk and/or approved mounting fixture; placement must not obstruct: wayfinding elements, art, regulatory signage, fire alarms, or any other station asset.
3. Sign shall be mounted prominently above all other signage within or related to the CAA.
4. Sign must be mounted directly above the call box if possible. In circumstances where this is not applicable, mount the sign as close as possible to the call box at the specified height.
5. Sign shall be visible from the same line of sight as the CAA call box. In the event that the sign cannot be mounted as specified, contact Design & Construction or System-Wide Accessibility for guidance on placement.
6. A minimum of one (1) sign shall be installed per CAA on each platform; in the instance of a center platform, contact Design & Construction or System-Wide Accessibility for sign totals and placement.
7. Sign must be fastened without protruding edges and in a manner that will prevent tampering.

B. Bridge Plate Sign

1. Sign shall be mounted centrally above bridge plate at a height of 60" above finished floor.

2. One (1) sign shall be installed per bridge plate.
3. Sign must be fastened without protruding edges and in a manner that will prevent tampering.
4. Sign must be placed within the confines of the CAA; in situations where this is not applicable contact Design & Construction or System-Wide Accessibility for guidance on placement.

C. Tactile Braille Sign

1. Customer Assistance Area Sign

- a. Sign must be mounted a maximum of 60" above finished floor to bottom of highest tactile letter.
- b. Sign must be mounted a minimum of 48" above finished floor to bottom of lowest tactile letter.
- c. Sign shall be mounted adjacent to the call box with 18 inches minimum clear space centered on tactile sign. Mount sign to the right of the call box when possible, in situations where this is not applicable contact Design & Construction or System-Wide Accessibility for guidance on placement.
- d. Sign must be fastened without protruding edges and in a manner that will prevent tampering.

2. Station ID/Line Direction Sign

- a. Sign must be mounted a maximum of 60" above finished floor to bottom of highest tactile letter.
- b. Sign must be mounted a minimum of 48" above finished floor to bottom of the lowest tactile letter.
- c. Sign shall be mounted adjacent to the Customer Assistance Area Tactile Braille sign with 18 inches minimum clear space centered on tactile sign. Mount sign to the right of the Customer Assistance Area Tactile Braille sign when possible, in situations where this is not applicable contact Design & Construction or System-Wide Accessibility for guidance on placement.
- d. When placed as specified, sign must be no more than two inches away from Customer Assistance Area Tactile Braille sign.
- e. Sign must be fastened without protruding edges and in a manner that will prevent tampering.

END OF SECTION

BACKLESS BENCH AND BACKED BENCH

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This specification section covers the furnishing and installation of backless benches and backed benches as applicable at various locations throughout the project.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Backed Bench

1. Seat must be minimum 10 gauge perforated steel backed bench and two (2) $\frac{1}{2}$ " x 3" flat steel bolt on armrests. Perforation hole diameter will be $\frac{3}{8}$ " (+/- $\frac{1}{16}$ ") and be $\frac{9}{16}$ " (+/- $\frac{1}{16}$ ") from center to center of the holes on a 60% angle.
2. Two (2) Armrests: each armrest must be positioned 23 $\frac{1}{8}$ " off end edge of bench. Half moon design attached to seat by straps on underside pinned to base of arm rest with stainless steel carriage bolts, stainless steel hex nuts, and stainless steel washers. There are not end armrests.
3. Back support must extend 2" maximum above the seat surface to a point 18" minimum above the seat surface.
4. Two (2) Supports: bench seat pipe and supports will be a minimum 2 $\frac{1}{2}$ " schedule 40 steel pipe (minimum 2 $\frac{7}{8}$ " O.D.).
5. Seat pipes must have an end dome cap.
6. Support plates must be 12" x 3" x $\frac{1}{2}$ " steel bar with $\frac{11}{16}$ " holes drilled 1" off edge on center and include $\frac{1}{2}$ " x 3 $\frac{3}{4}$ " expansion anchor bolts.
7. Height from base plate to seat surface must be 17 $\frac{1}{2}$ " (- $\frac{1}{2}$ ") (+1 $\frac{1}{2}$ ").
8. Bench depth must be 26 $\frac{1}{2}$ " (+/- 1").
9. Length must be between 4-6' as applicable.
10. Fasteners must be stainless steel.
11. Seat must be MIG welded to supports.
12. Entire bench must be all MIG welded steel construction.
13. All steel members must be coated with zinc rich epoxy and finished with black polyester powder coating. Finish must be equal or better. The MBTA reserves the right to decide efficacy of proposed coating and disqualify inferior coatings.
14. Minimum weight 196 lbs Maximum weight 225 lbs.

B. Backless Bench

1. Seat must be minimum 10 gauge perforated steel with two ½" x 3" flat steel bolt on armrests. Perforation hole diameter will be 3/8" (+/- 1/16") and be 9/16" (+/- 1/16") from center to center of the holes on a 60% angle.
2. Two (2) Armrests: each arm rest must be positioned 23 1/8" off end edge of bench. Half moon design attached to seat by straps on underside pinned to base of armrest with stainless steel carriage bolts, stainless steel hex nuts, and stainless steel washers.
3. Two (2) Supports: bench seat pipe and supports will be minimum 2 ½" schedule 40 steel pipe (minimum 2 7/8" outside diameter).
4. Seat pipes must have an end dome cap.
5. Support plates must be minimum 12" x 3" x ½" steel bar with 11/16" holes drilled 1" off end edge on center and include ½" x 3 ¾" expansion anchor bolts.
6. Height from base plate to bench top is 17 ½" (-1/2") (+1 ½").
7. Bench width 19 15/16" (+/- 1").
8. Length must be between 4-6' as applicable.
9. Bench must be all welded steel construction.
10. Seat must be MIG welded to supports.
11. All steel members must be coated with zinc rich epoxy and finished with black polyester powder coating. Finish must be equal or better. The MBTA reserves the right to decide efficacy of proposed coating and disqualify inferior coatings.
12. Fasteners must be stainless steel.
13. Minimum weight 150 lbs Maximum weight 200 lbs.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Backed Bench

1. Install in locations that lack an existing ADA compliant bench and lack either a wall or sturdy flat surface that could be used as suitable back support.
2. Install one (1) backed bench as specified in Section 2.1 B 1-13 for each individual CAA location. For CAA's located on center platform's place a total of two (2) backed benches back to back.
3. Backed benches must be placed so that the footings sit within the confines of the CAA as indicated by the two directional tactile segments.

4. Backed benches must be installed in a manner that provides 30" Depth x 48" Length of clear space on one (1) side.
5. Benches must be installed in a parallel fashion to the tracks.

B. Backless Bench

1. Install in locations that do not already possess an existing ADA compliant bench but is adjacent to either a wall or sturdy flat surface (glass surfaces are not an acceptable back support).
2. Install one (1) backless bench as specified in Section 2.1 A 1-13 for each individual CAA location.
3. Backless benches must be installed 2 ½" maximum from the rear edge of seat to the wall or flat surface.
4. The wall or flat surface to be used as a back support shall extend from a point 2" maximum above the seat surface to a point 18" minimum above the seat surface of the backless bench.
5. Backless benches must be installed in a manner that provides 30" Depth x 48" Length of clear space on one (1) side.
6. Benches must be installed in a parallel fashion to the tracks.

END OF SECTION