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# Atlanta Regional Commission Unified Bus Stop Signage Task 4: 100% Construction Documentation

## 20 November 2013



FD2S INC.

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PROJECT NAME/PROJECT CODE

Atlanta Regional Commission  
Unified Bus Stop Signage  
13ARC001

ISSUES/REVISIONS

28JUN2013 Task 1, Concept Development, 30% CD's  
20AUG2013 Task 2, Schematic Design, 60% CD's  
07NOV2013 Task 3, Detail Design, 90% CD's  
20NOV2013 Task 4, Construction Documentation, 100% CD's

## GIS Inventory

### GIS Inventory

Inventory Wrap-Up ..... 1

### Assets

Bus Operator Logos ..... G3

Colors ..... G4

Colors ..... G5

### Typography

Clearview Hwy 1-W ..... G6

Clearview Hwy 2-W ..... G7

Clearview Hwy 4-W ..... G8

## Sign Drawings

### Sign Type Family

Tiers ..... G10

### Information Panels

Panel Sizes ..... G11

Panel Assembly Details ..... G12

Route Panel Layouts ..... G13

Small ADA Panel Layout ..... G14

Banner Panel Layout ..... G15

### Sign Type 100

Illuminated Disc on Custom Pole ..... G16

Ground Anchoring Details ..... G17

Base & Access Panel Details ..... G18

Custom Pole and Cap Details ..... G19

Illuminated Disc Details ..... G20

Route Panel Mounting Details ..... G21

Breakaway Support ..... G22

Cut Sheets ..... G22

Illuminated Disc on Custom Pole ..... G23

### Sign Type 101

Perforated Square Pole ..... G24

Perforated Square Pole ..... G25

Perforated Square Pole ..... G26

Perforated Square Pole ..... G27

Perforated Square Pole ..... G28

### Sign Type 102

U-Channel Pole ..... G29

U-Channel Pole ..... G30

U-Channel Pole ..... G31

U-Channel Pole ..... G32

U-Channel Pole Cut Sheets ..... G33

### Sign Type 103A

Existing Decorative Pole ..... G34

Existing Decorative Pole ..... G35

Existing Decorative Pole ..... G36

### Sign Type 103B

Metal Utility Pole ..... G37

Metal Utility Pole ..... G38

## Appendix A

### Appendix A

Poles and Mounting Hardware Pricing ..... A1

Information Panel Pricing ..... A2

Pricing Summary ..... A3

## Appendix A Alternate

### Appendix A Alternate

Information Panel Pricing ..... A4

## Appendix B

### Appendix B

ADA Text Height Matrix ..... B1

ADA Sign Location Zone ..... B2

ADA Accessible Zone ..... B3

ADA Accessible Zone ..... B4

## Appendix C

### Appendix C

Solar Panel Analysis ..... C2

Solar Panel Application Examples ..... C3

### Appendix C

Realtime Messaging Examples ..... C4 – C5

## Appendix D

### Appendix D

Section 101400 ..... D1 – D7

## Appendix E

### Appendix E

Submittal Schedule ..... E1



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Table of Contents

SHEET NUMBER

---

# GIS Inventory



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# Inventory Wrap-up

Panel Type	Quantity
Total Tier 1	63 (possibly 73 with Art Center Station)
Tier 2 Alt	0 (possibly 10 with Art Center Station)
Tier 3	2
Tier 4 Alt Metal	1

Panel Type	Quantity
Large+	8
Large	25
Medium	12
Small	31

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# Assets



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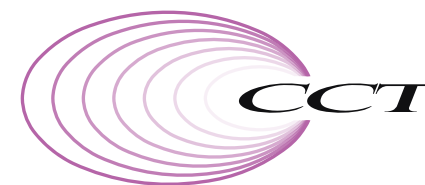
Metropolitan Atlanta Rapid Transit Authority



Georgia Regional Transportation Authority



Xpress



Cobb Community Transit



Atlantic Station

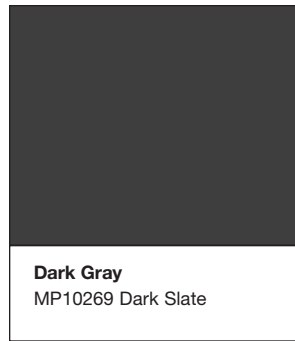


Georgia Tech



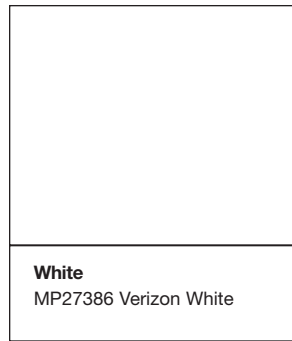
ATLANTA STREETCAR

Atlanta Streetcar



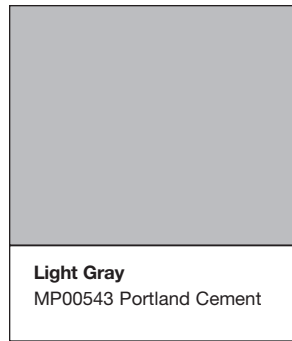
**Dark Gray**  
MP10269 Dark Slate

**Color C1**



**White**  
MP27386 Verizon White

**Color C2**



**Light Gray**  
MP00543 Portland Cement

**Color C3**



**CODA Green**  
Custom-Matched Thnec  
Paint Formula

**Color C4**



**Breeze Blue**  
MP10359 Tonal Blue

**Color C5**



**MARTA Blue**  
Match Agency Brand  
Guidelines

**Color C6**



**MARTA Yellow**  
Match Agency Brand  
Guidelines

**Color C7**



**MARTA Orange**  
Match Agency Brand  
Guidelines

**Color C8**



**GCT Olive**  
Match Agency Brand  
Guidelines

**Color C9**



**GCT Red**  
Match Agency Brand  
Guidelines

**Color C10**



**Xpress Blue**  
Match Agency Brand  
Guidelines

**Color C11**



**Xpress Green**  
Match Agency Brand  
Guidelines

**Color C12**



**Xpress Light Blue**  
Match Agency Brand  
Guidelines

**Color C13**



**CCT Purple**  
Match Agency Brand  
Guidelines

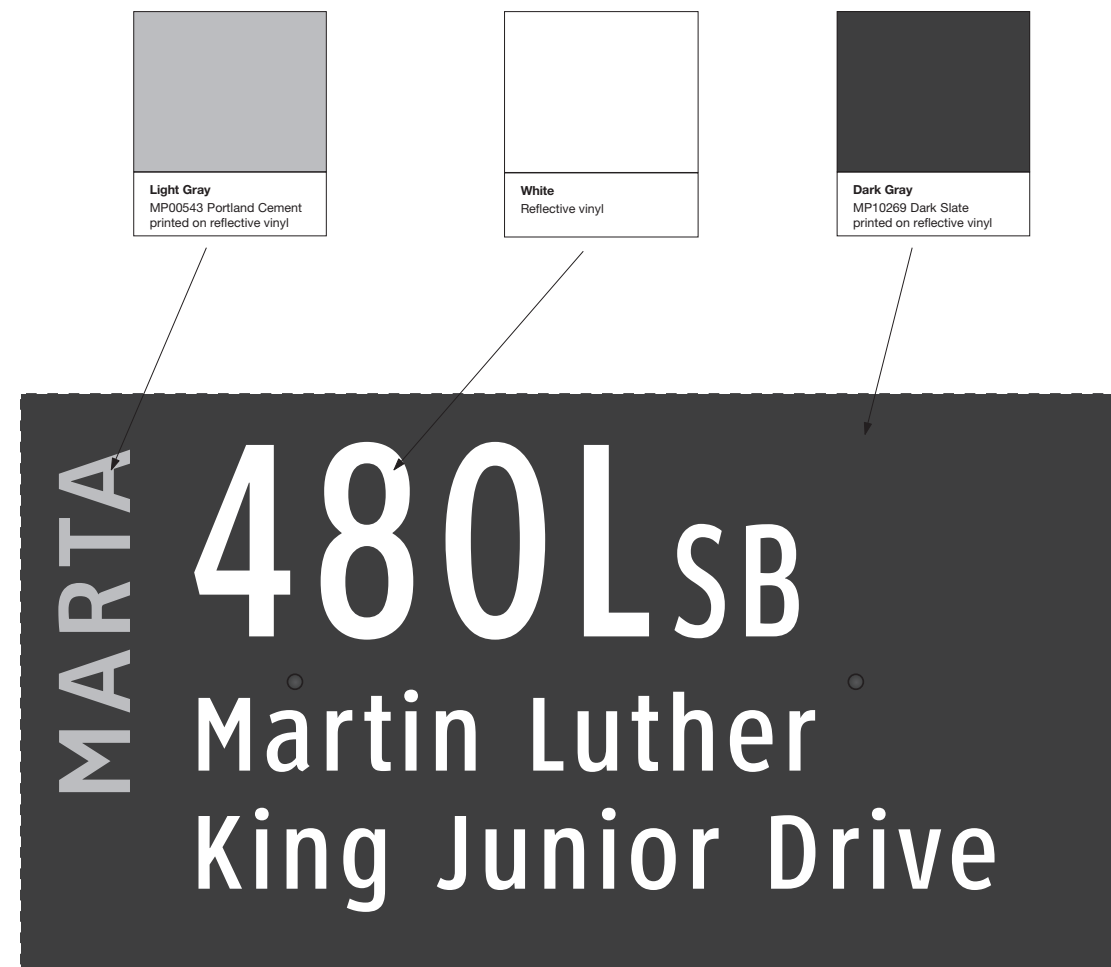
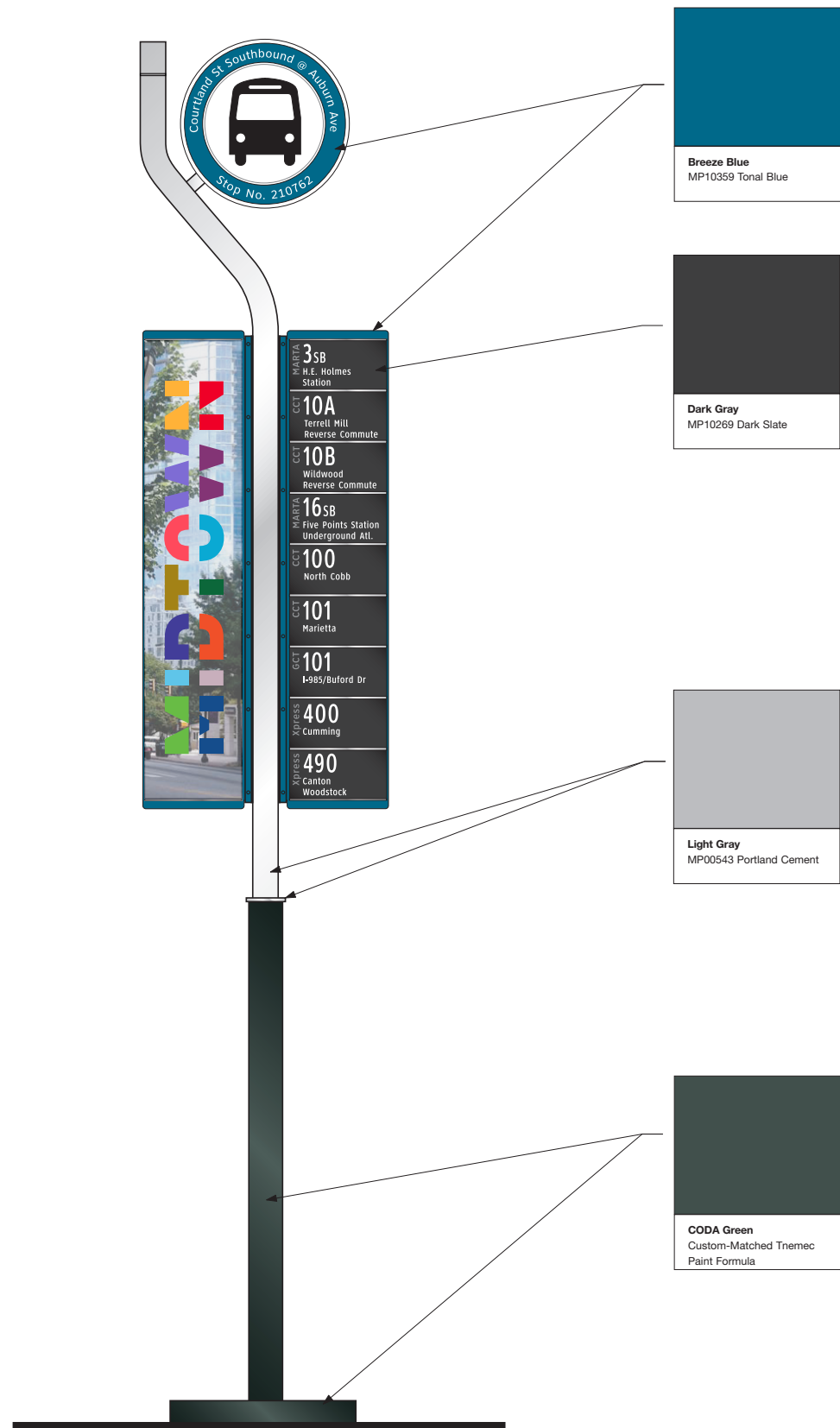
**Color C14**

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- Matthews Paint [matthewspaint.com](http://matthewspaint.com)
- Pantone [pantone.com](http://pantone.com)
- RAL [ral.de](http://ral.de)
- Toyo Ink [toyoink.co.jp](http://toyoink.co.jp)
- Tnemec [tnmec.com](http://tnmec.com)





ABCDEFGHIJKLMNOPQRSTUVWXYZ  
 abcdefghijklmnopqrstuvwxyz  
 1234567890!@#\$%^&()!:"',.?'"

1 Font Set  
 Clearview Hwy 1-W

All stated type dimensions  
 in documents are cap height

A F b c g y 1 2 3

2 Type Size Measurement  
 No Scale

Typography Typography

Normal **letterspacing** is to be used on this project unless otherwise noted – in Adobe Illustrator, set kerning to “optical”

~~Typography Typography~~

Loose **letterspacing** is not to be used on this project for any reason, including copyfitting, unless otherwise noted

~~Typography Typography~~

Tight **letterspacing** is not to be used on this project for any reason, including copyfitting, unless otherwise noted

3 Letter and Word Spacing  
 No Scale

“Visitor’s entrance 8’-10””

Please note the difference between foot/inch marks and apostrophe/quotation marks.

4 Typesetting  
 No Scale

**Note**  
 The typeface shown is used in this environmental graphics program. The font shown here is for reference only, and may not in any way be used as artwork. No font substitutions are allowed. Font names must match exactly for accurate execution of design; “LT Std” following a font denotes an OpenType font. Fonts are available for purchase through a variety of retailers, likely including:

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- fonts.com
- typography.com
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ABCDEFGHIJKLMNOPQRSTUVWXYZ  
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1234567890!@#\$%^&()';:'.?'"

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2 Type Size Measurement  
No Scale

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No Scale

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Please note the difference between foot/inch marks and apostrophe/quotation marks.

4 Typesetting  
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Typography  
Clearview Hwy 2-W

**SHEET NUMBER**  
G7.0

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 abcdefghijklmnopqrstuvwxyz  
 1234567890!@#\$%^&()';:'''',..?''''

1 Font Set  
 Clearview Hwy 4-W

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 in documents are cap height

A F b c g y 1 2 3

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 No Scale

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# Sign Drawings



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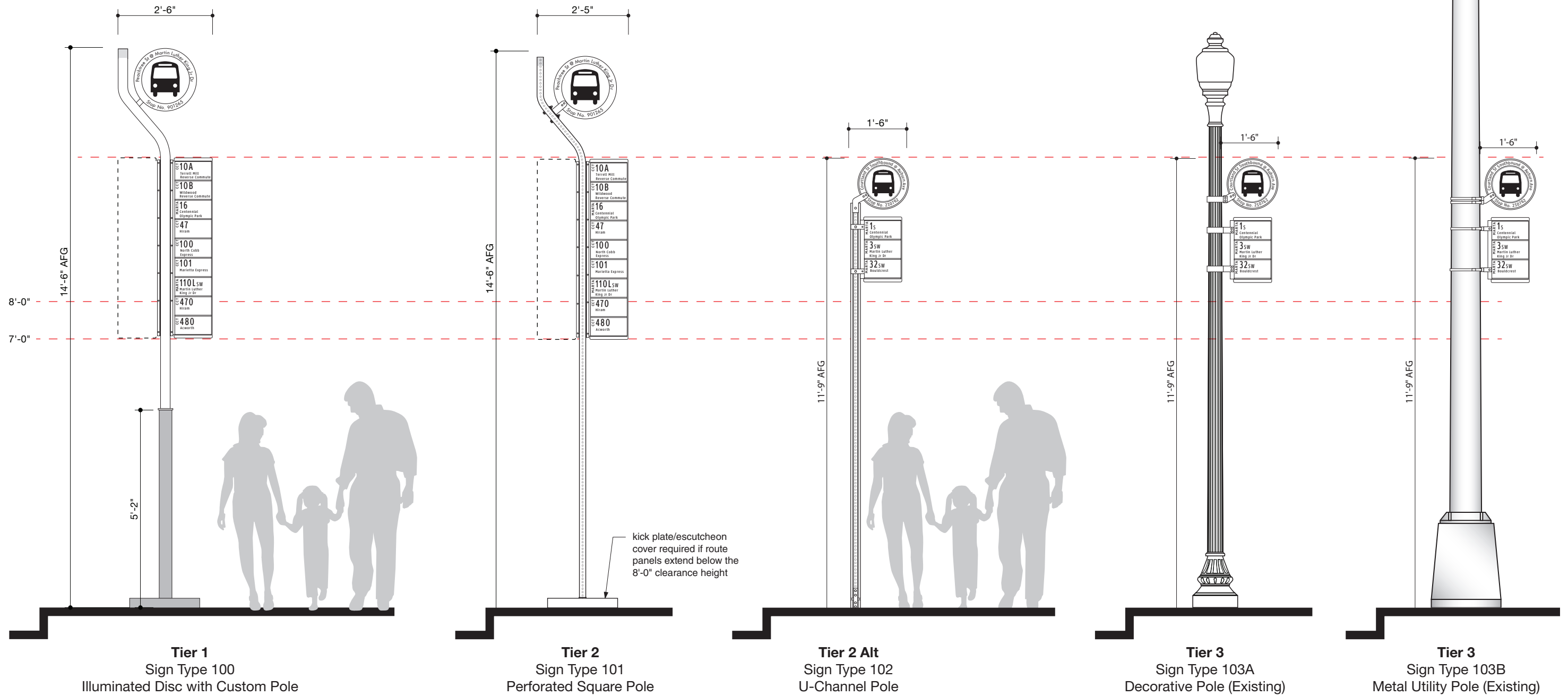
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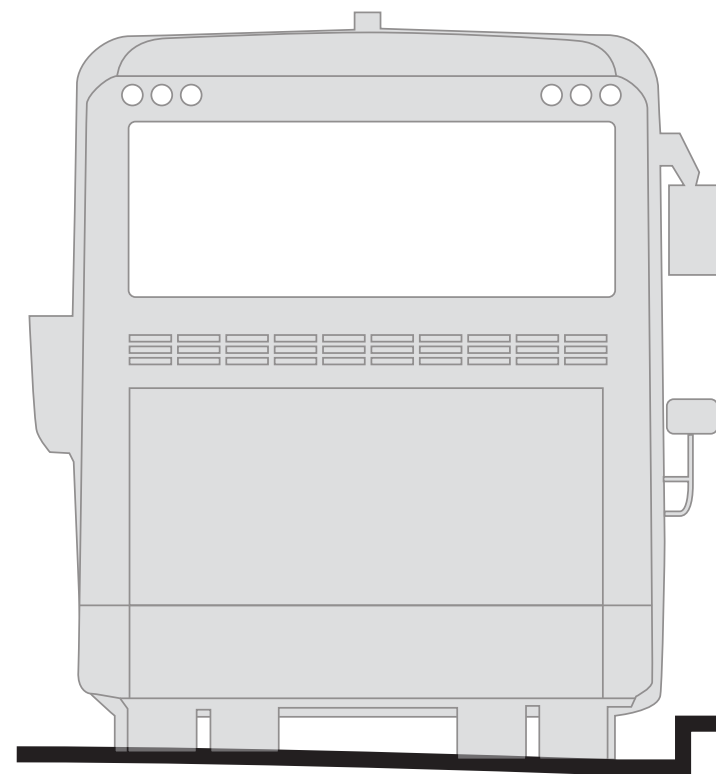
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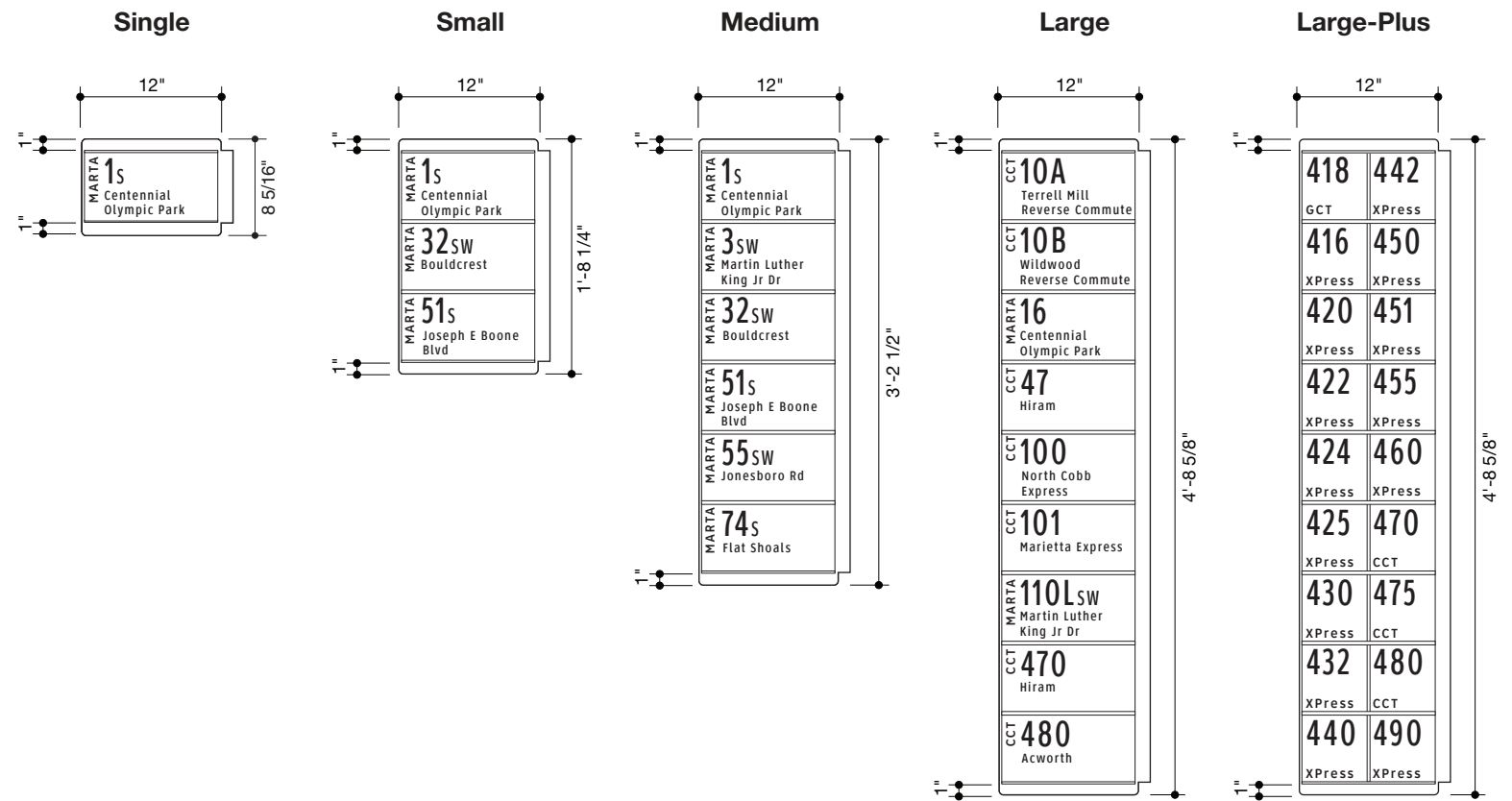
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**1** Front Elevation  
Scale: 3/8"=1'-0"



**2** Standard Panel Sizes  
Scale: 3/4"=1'-0"



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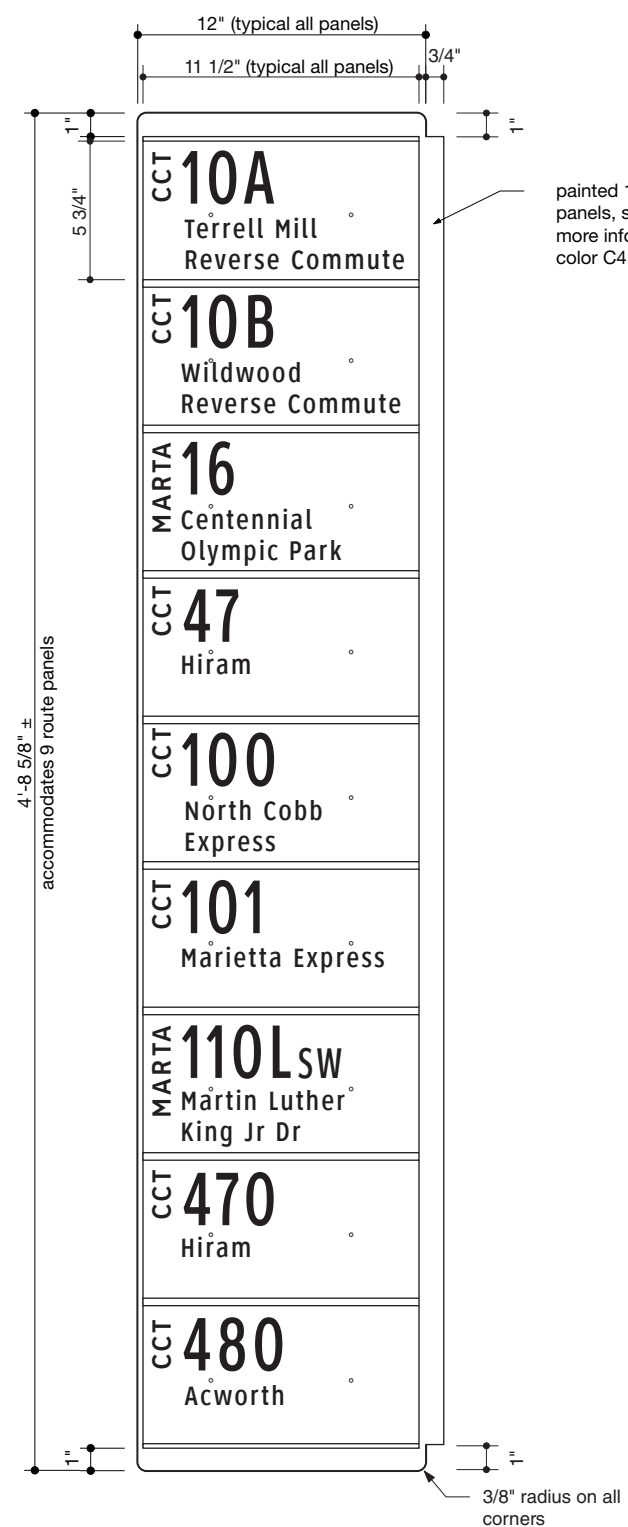
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**PAGE TITLE / ELEMENT TYPE**  
**Information Panels  
Panel Sizes**

**SHEET NUMBER**  
**G11.0**



NOTE: Other panels similar.  
**1 Large Panel Elevation**  
 Scale: 1 1/2"=1'-0"

painted 1/8" thick aluminum panels, see panel details for more information color C4

1/8" thick painted aluminum panel color C5

welded 1/8" dia., 1/4" long pin/stopper with rounded head, painted to match insert background color

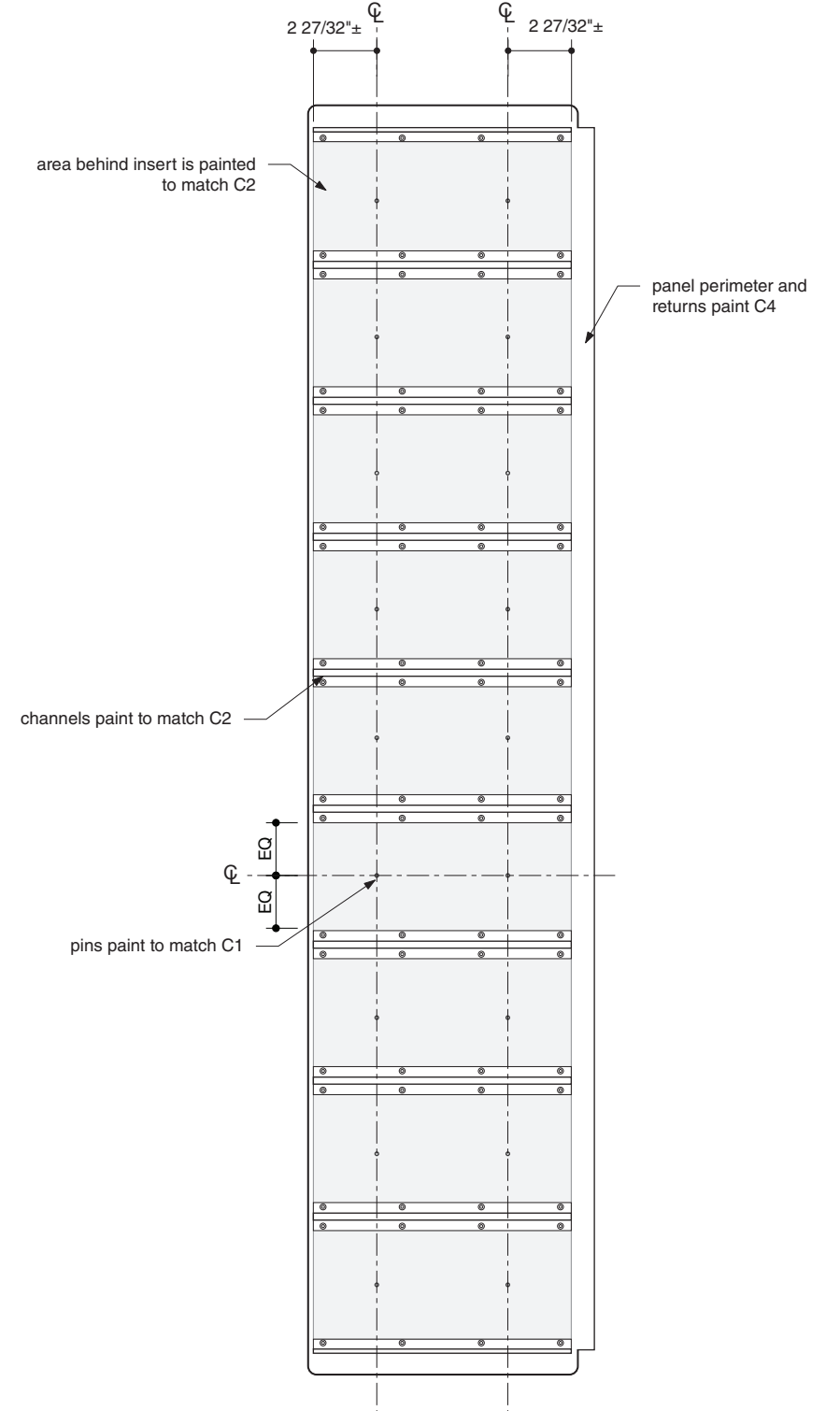
painted J-channel, riveted to aluminum panel, rivets capture J-channel on opposite side; color to match C2

0.040" thick fiberglass panel (11 1/2" X 6") insert wrapped with high-intensity retro-reflective vinyl graphics

asymmetrical H-channel, riveted to aluminum panel, rivets capture H-channel on opposite side; color to match C2

3/8" radius on all corners

**2 Route Panel Inserts**  
 Scale: NTS



area behind insert is painted to match C2

channels paint to match C2

pins paint to match C1

panel perimeter and returns paint C4

**3 Route Panel Painted Areas**  
 Scale: NTS



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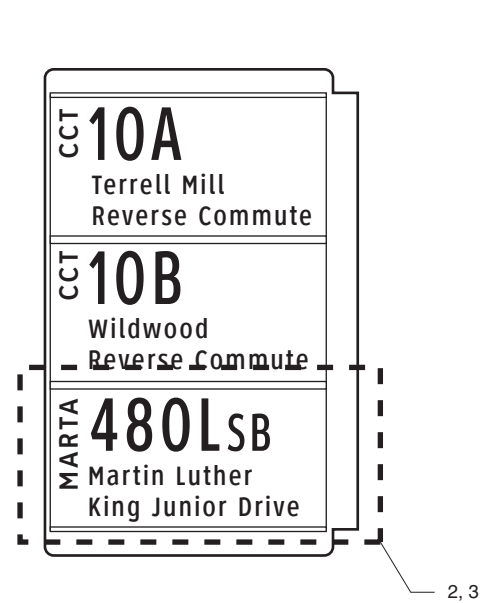
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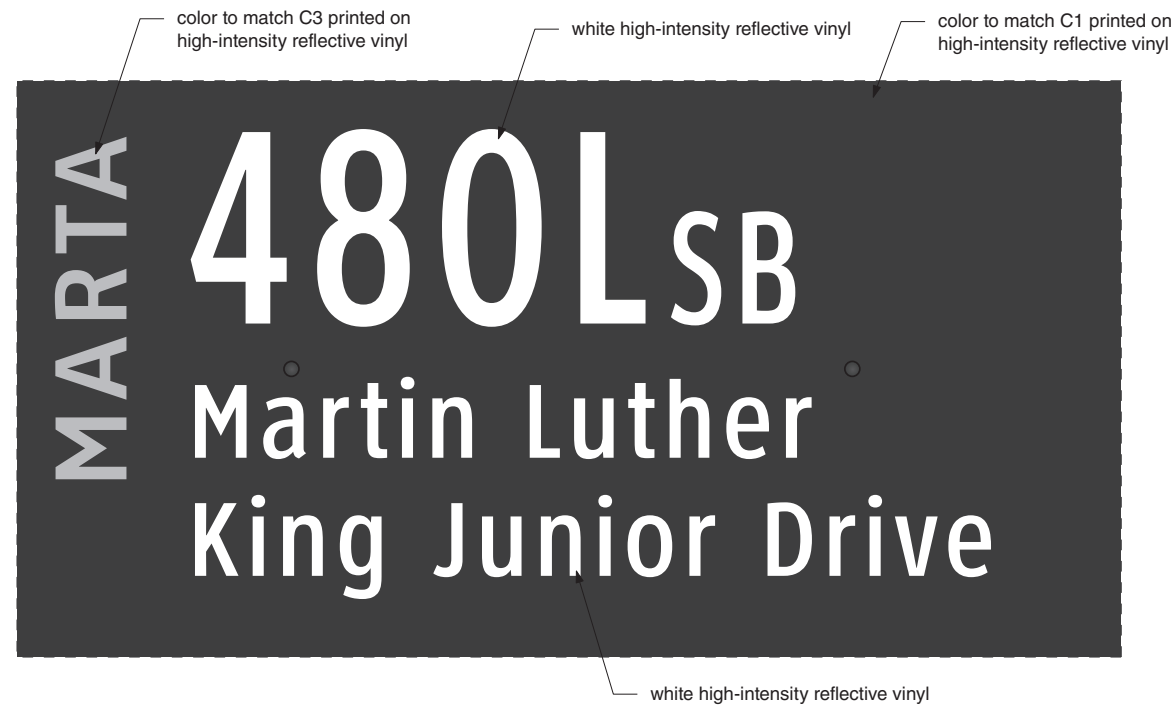
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 Panel Assembly Details

**SHEET NUMBER**

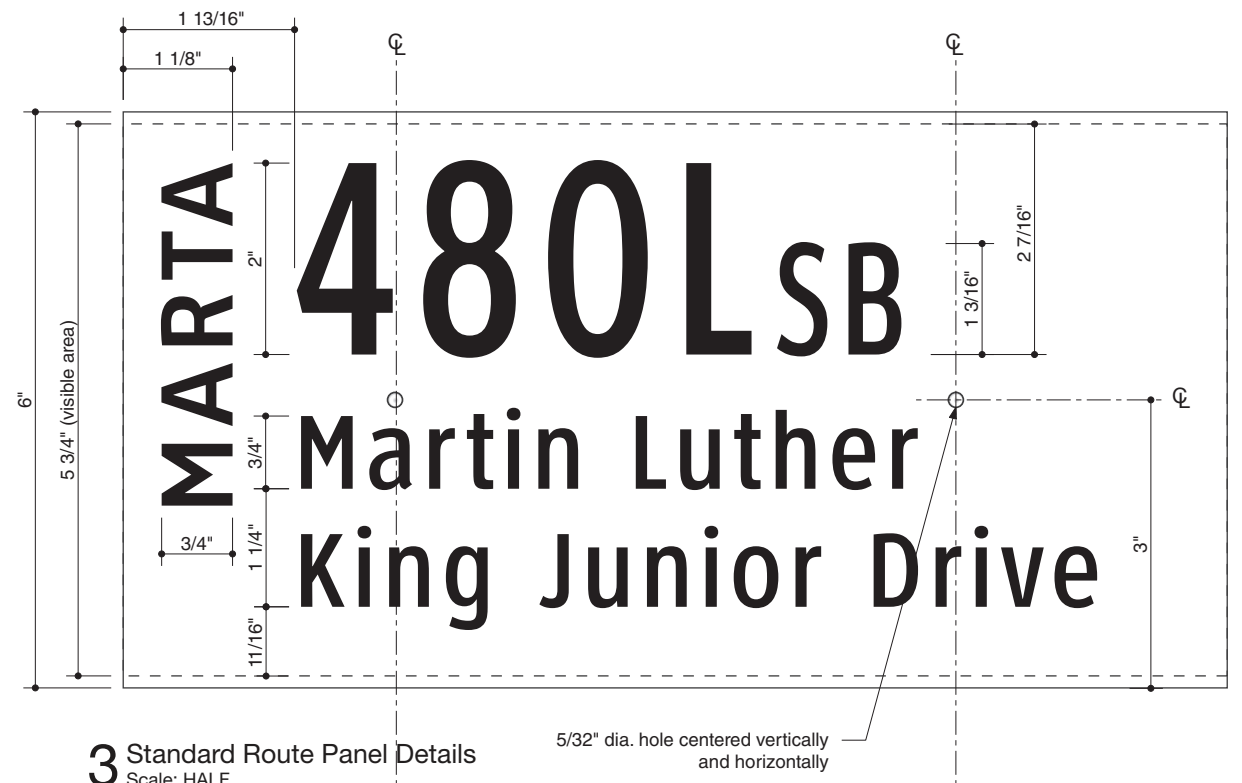
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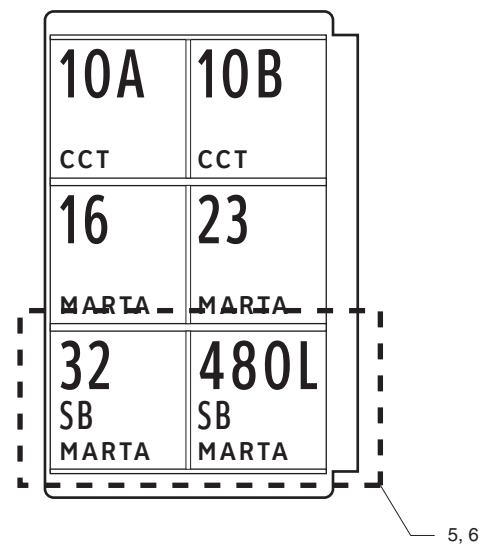
1 Standard Route Configuration  
Scale: 1 1/2"=1'-0"



2 Standard Route Single Panel  
Scale: HALF



3 Standard Route Panel Details  
Scale: HALF



4 Alternate Route Configuration  
Scale: 1 1/2"=1'-0"



5 Alternate Route Single Panels (Two Panels)  
Scale: HALF



6 Alternate Route Panel Details  
Scale: HALF



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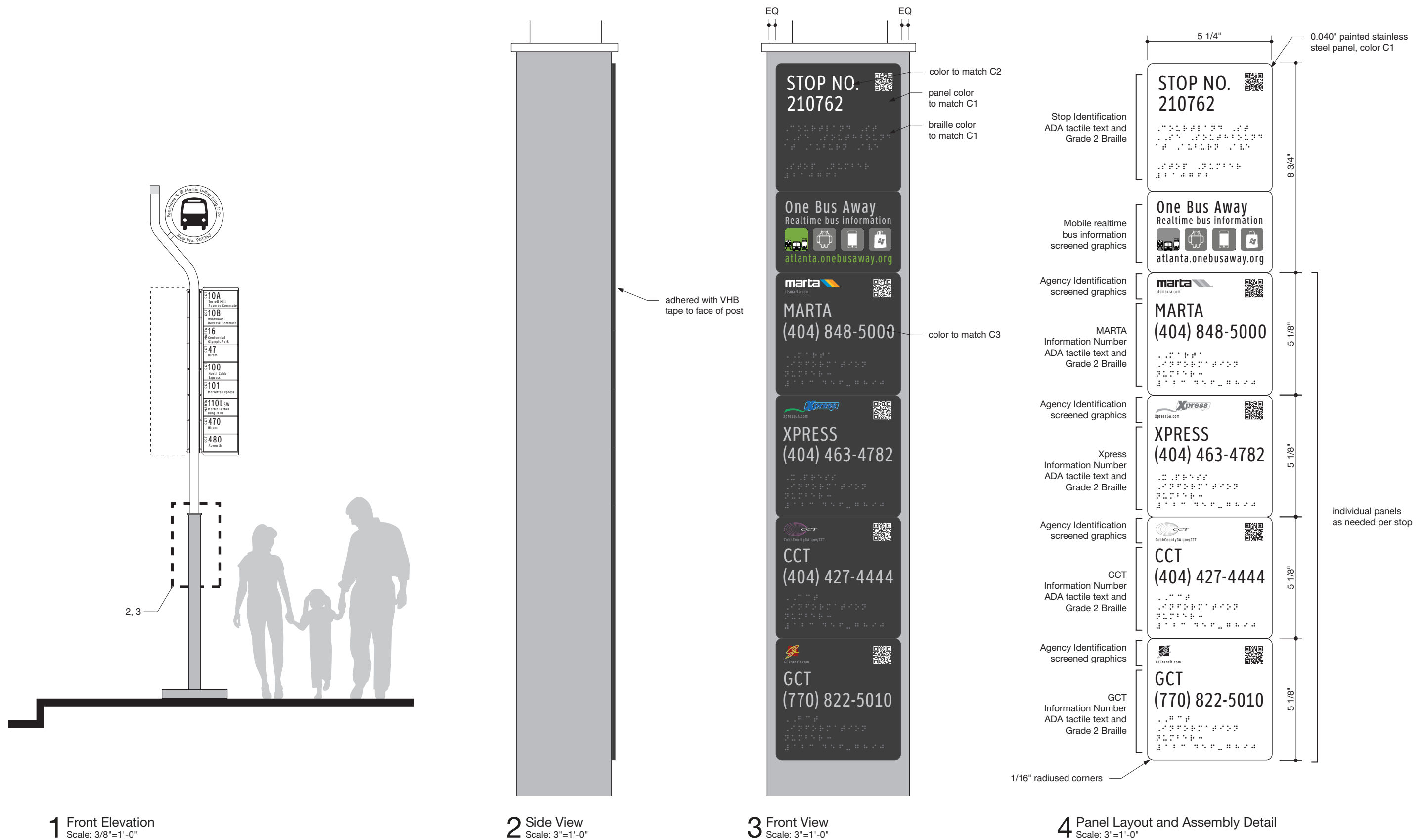
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PAGE TITLE / ELEMENT TYPE  
**Information Panels**  
**Route Panel Layouts**

SHEET NUMBER  
**G13.0**





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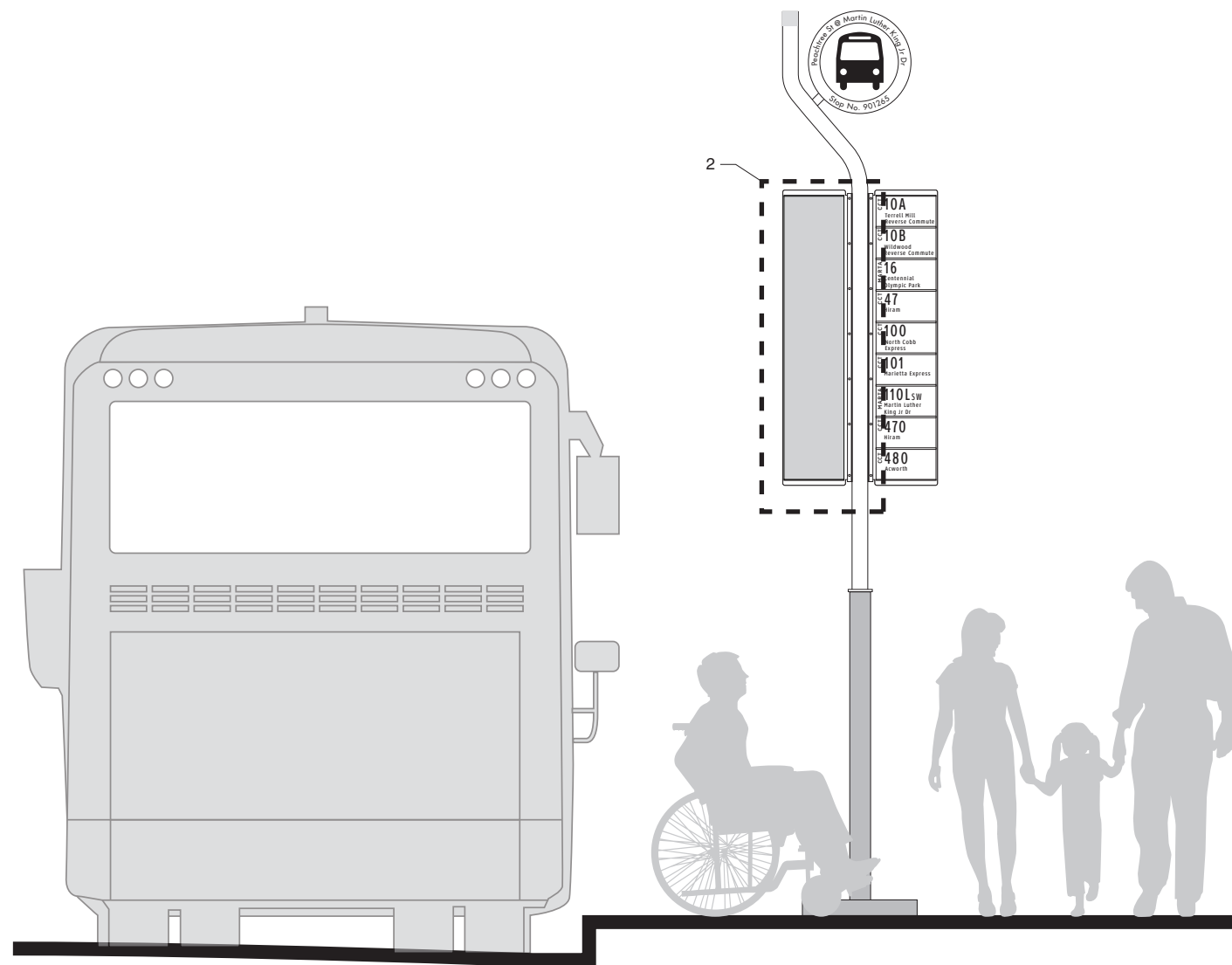
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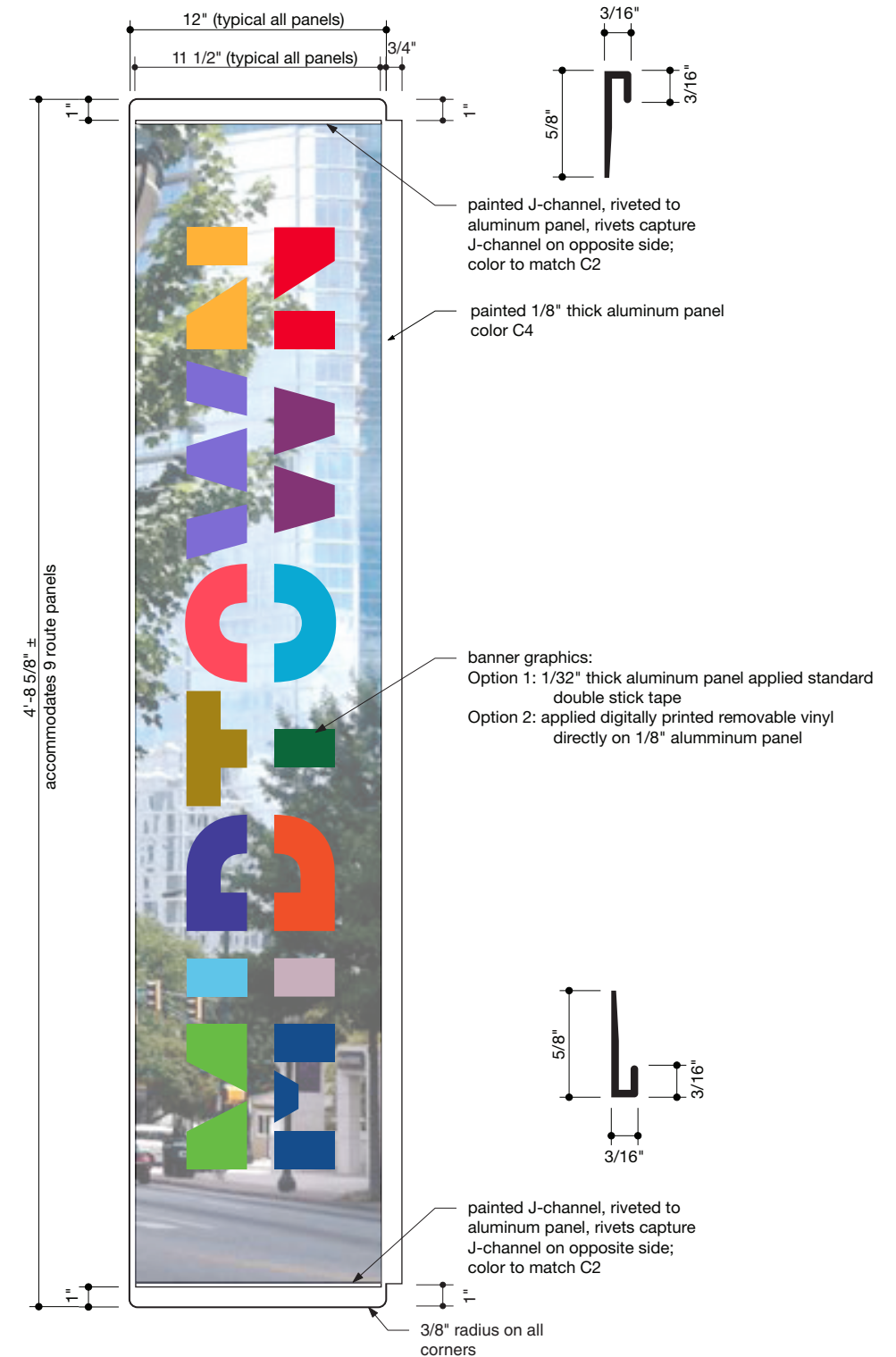
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**Information Panels**  
**Small ADA Panel Layout**

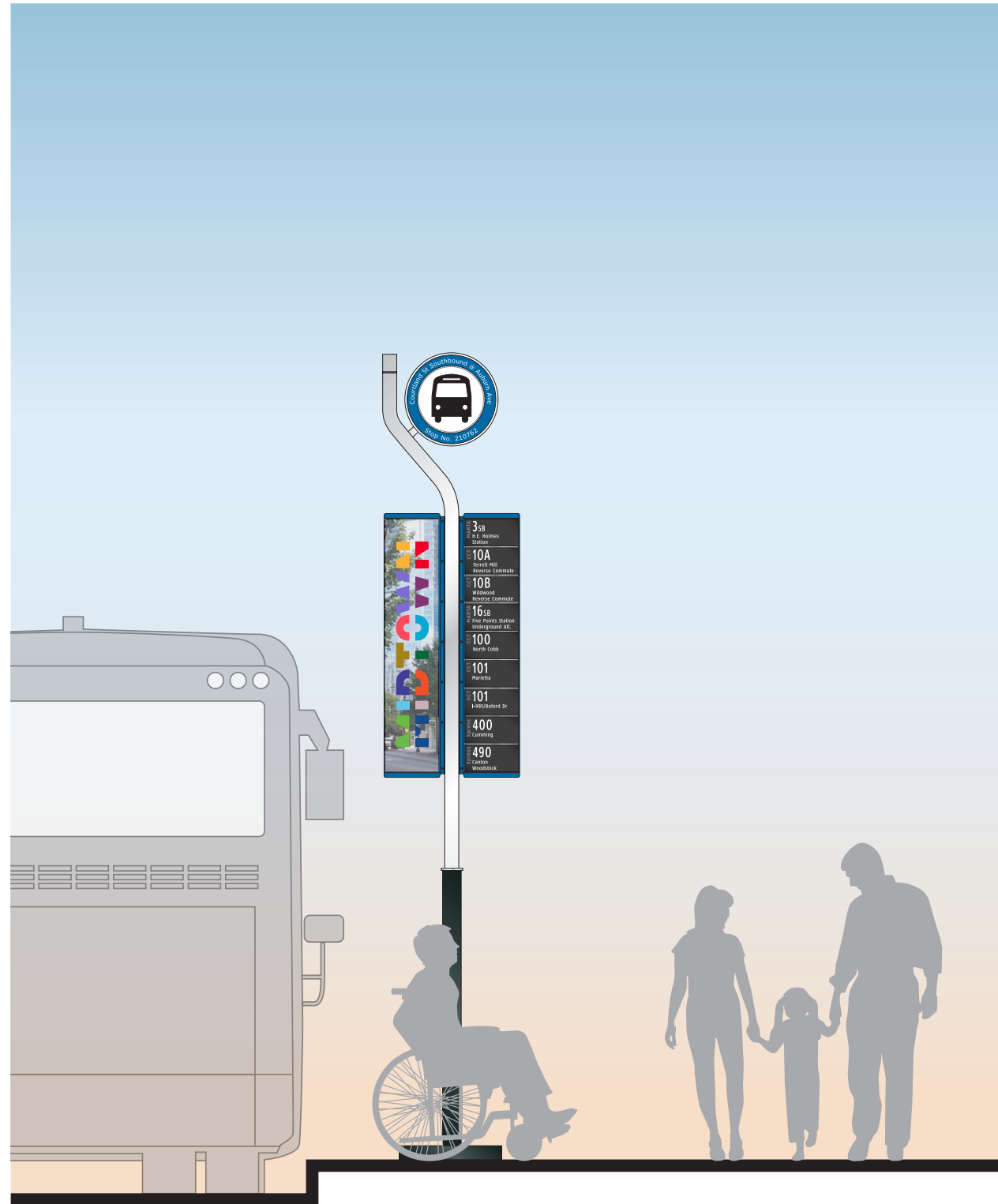
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**G14.0**



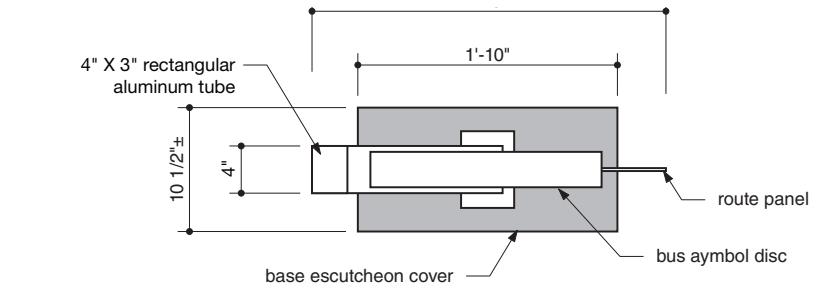
1 Front Elevation  
Scale: 3/8"=1'-0"



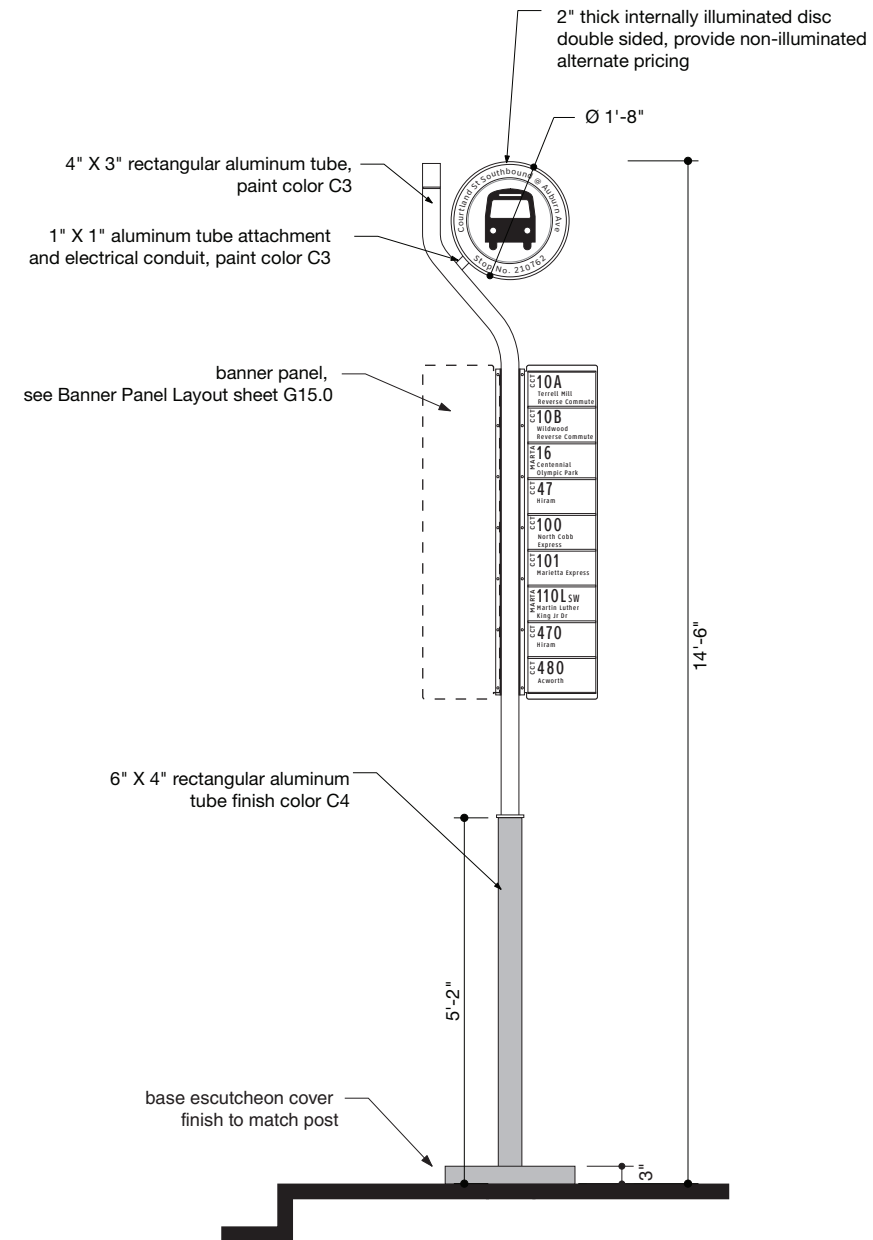
2 Large Banner Panel Elevation  
Scale: 1 1/2"=1'-0"



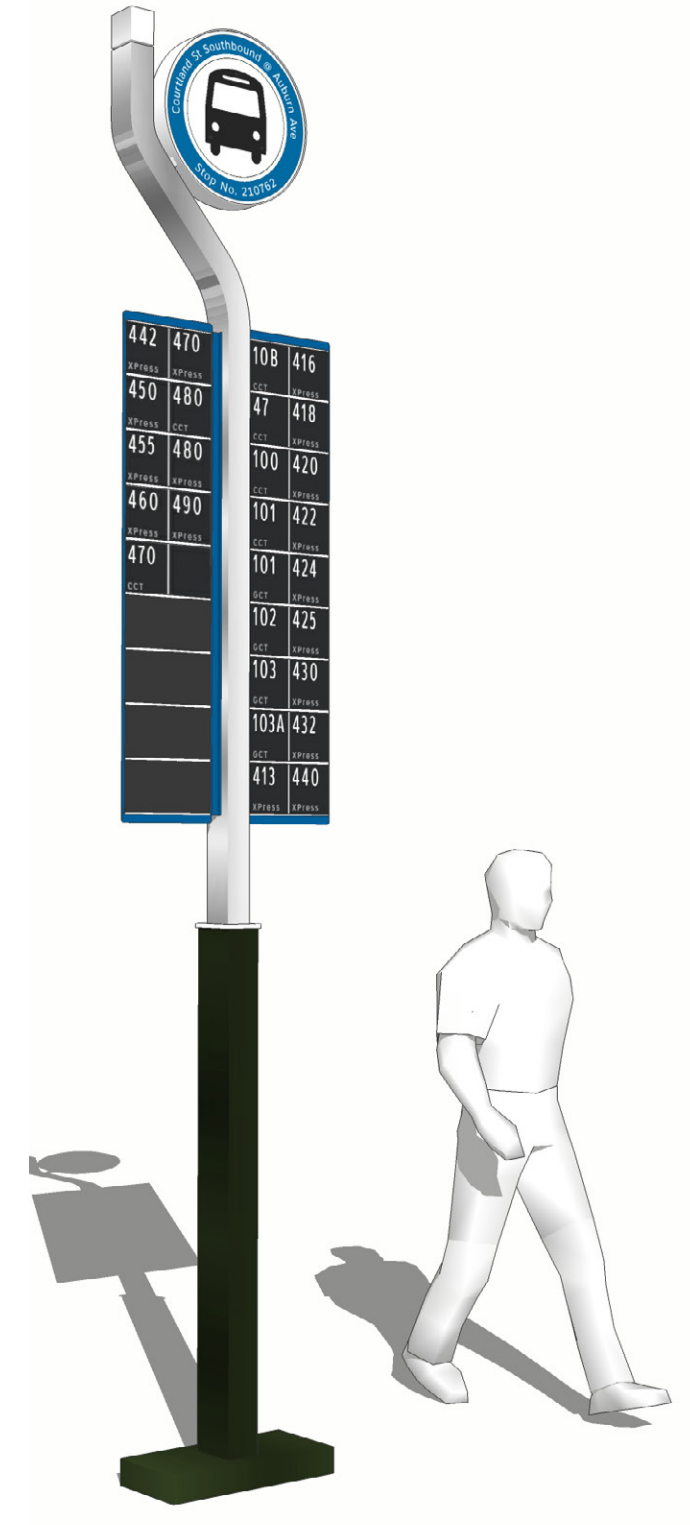
**1 Front Elevation**  
Scale: 3/8"=1'-0"



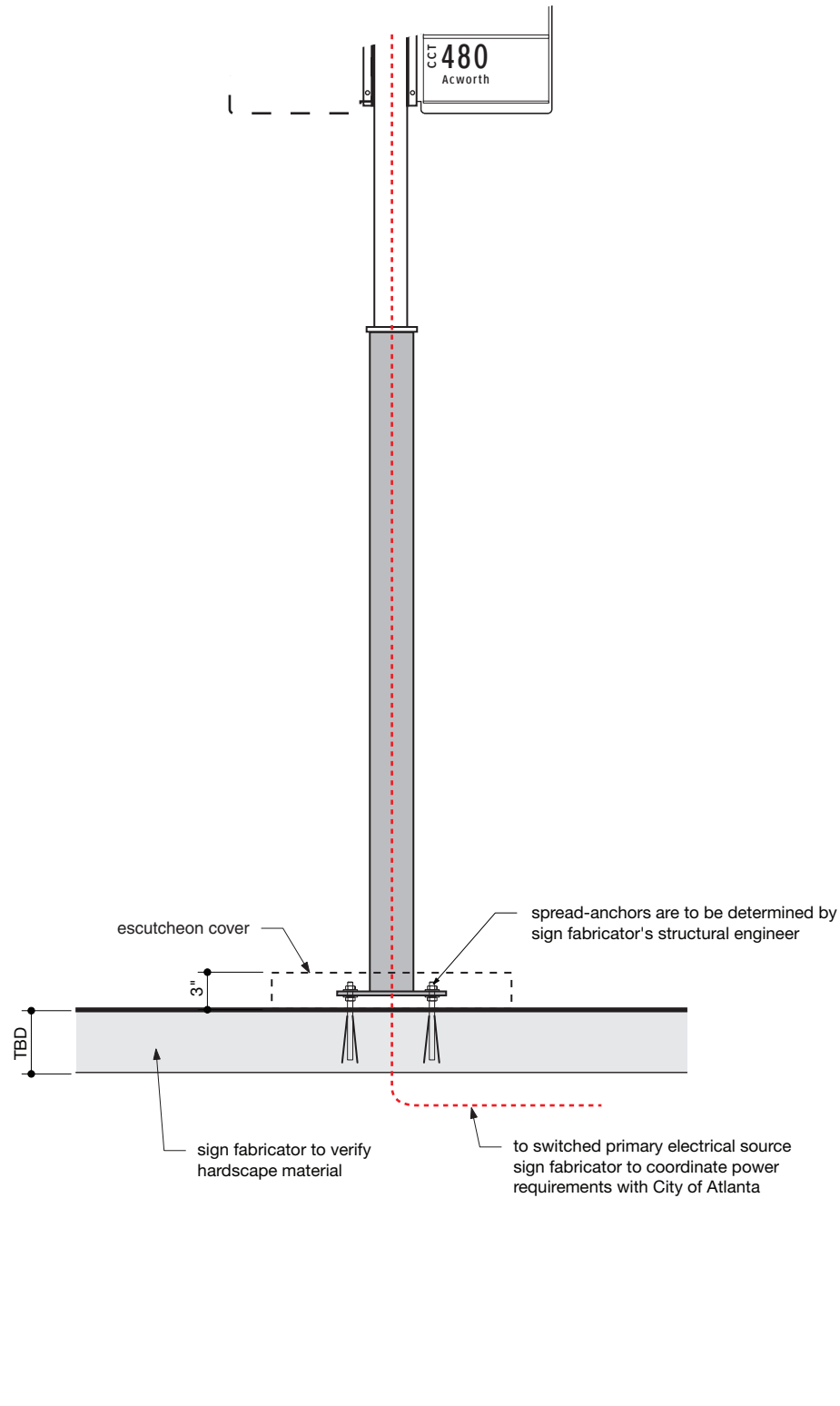
**3 Plan View**  
Scale: 3/4"=1'-0"



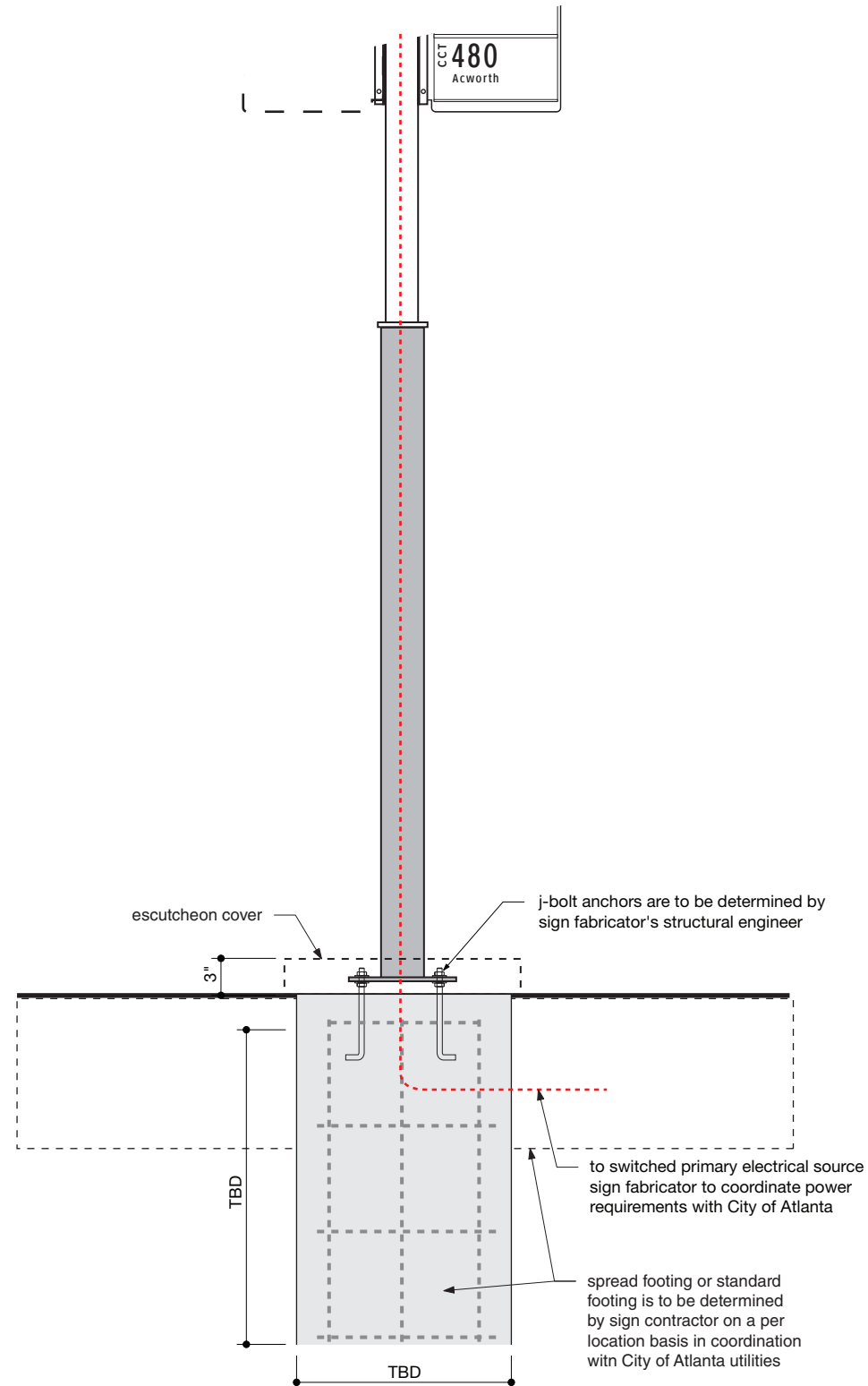
**2 Front Elevation**  
Scale: 3/8"=1'-0"



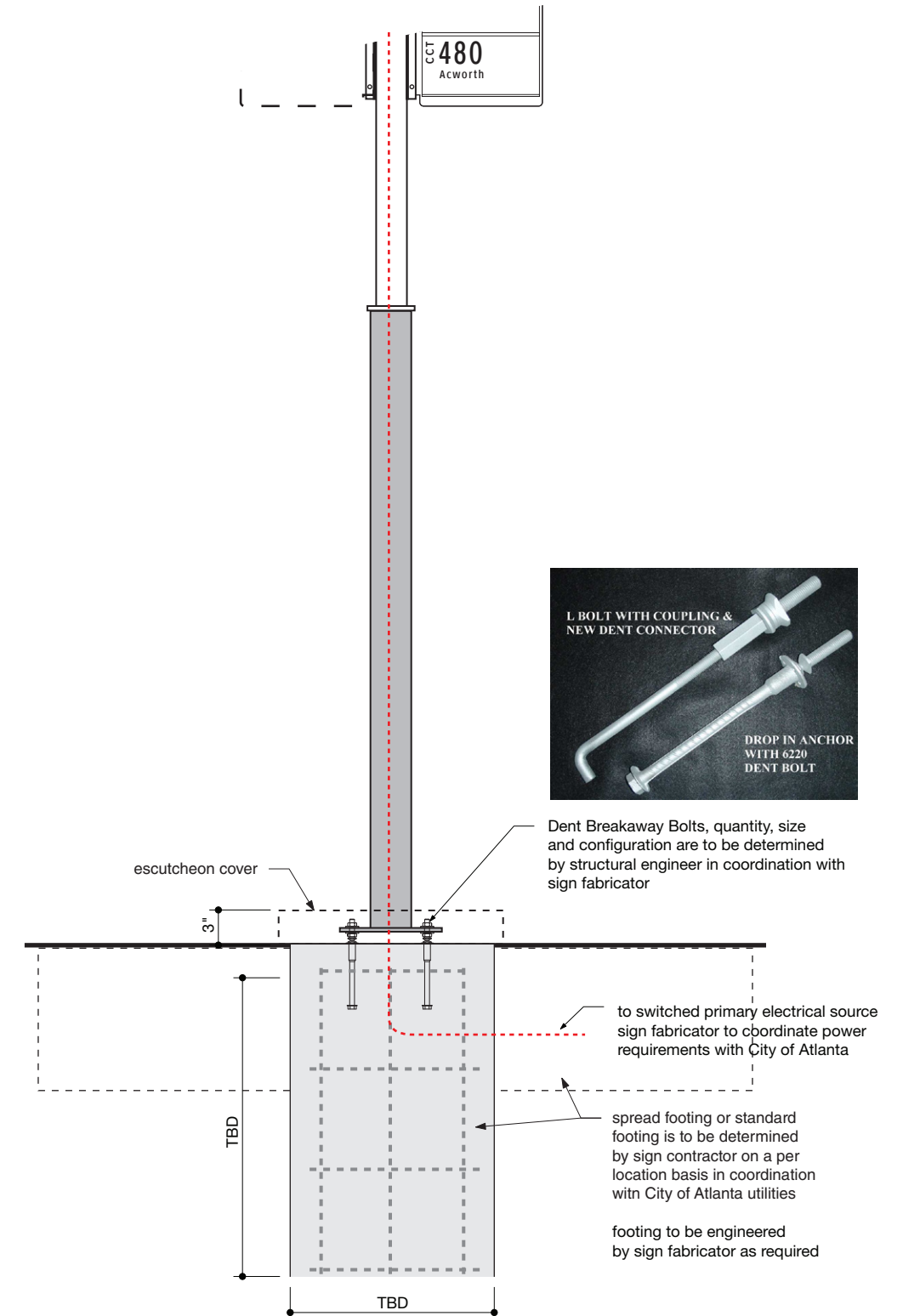
**4 Model Vignette**  
Scale: NTS



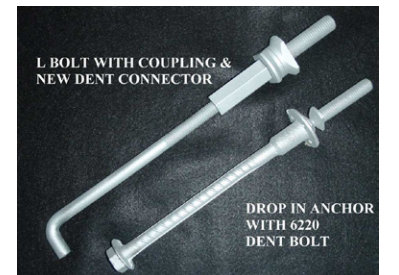
**1** Spread-Anchor on Existing Hardscape  
Scale: 3/4" = 1'-0"



**2** J-Bolt Anchor with Foundation  
Scale: 3/4" = 1'-0"



**3** Breakaway Anchor with Foundation  
Scale: 3/4" = 1'-0"



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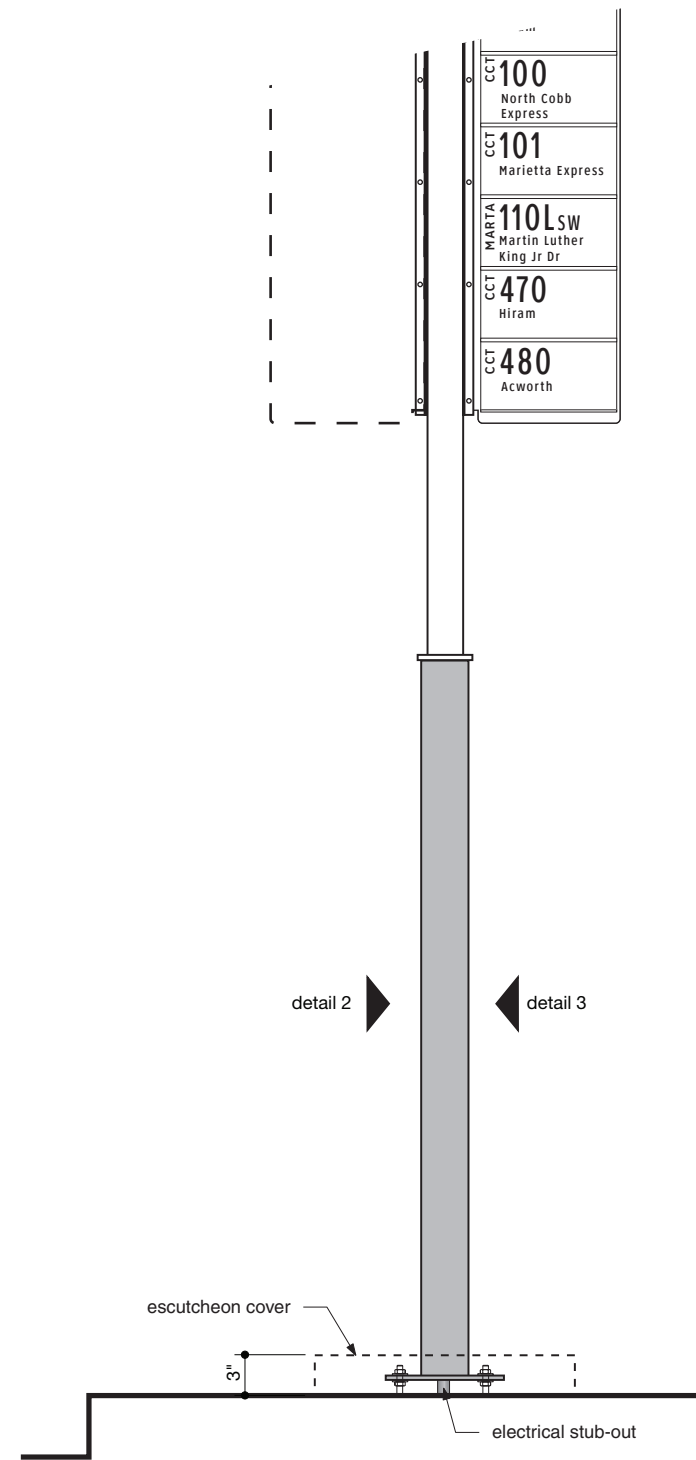
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**Atlanta Regional Commission**  
**Unified Bus Stop Signage**  
13ARC001

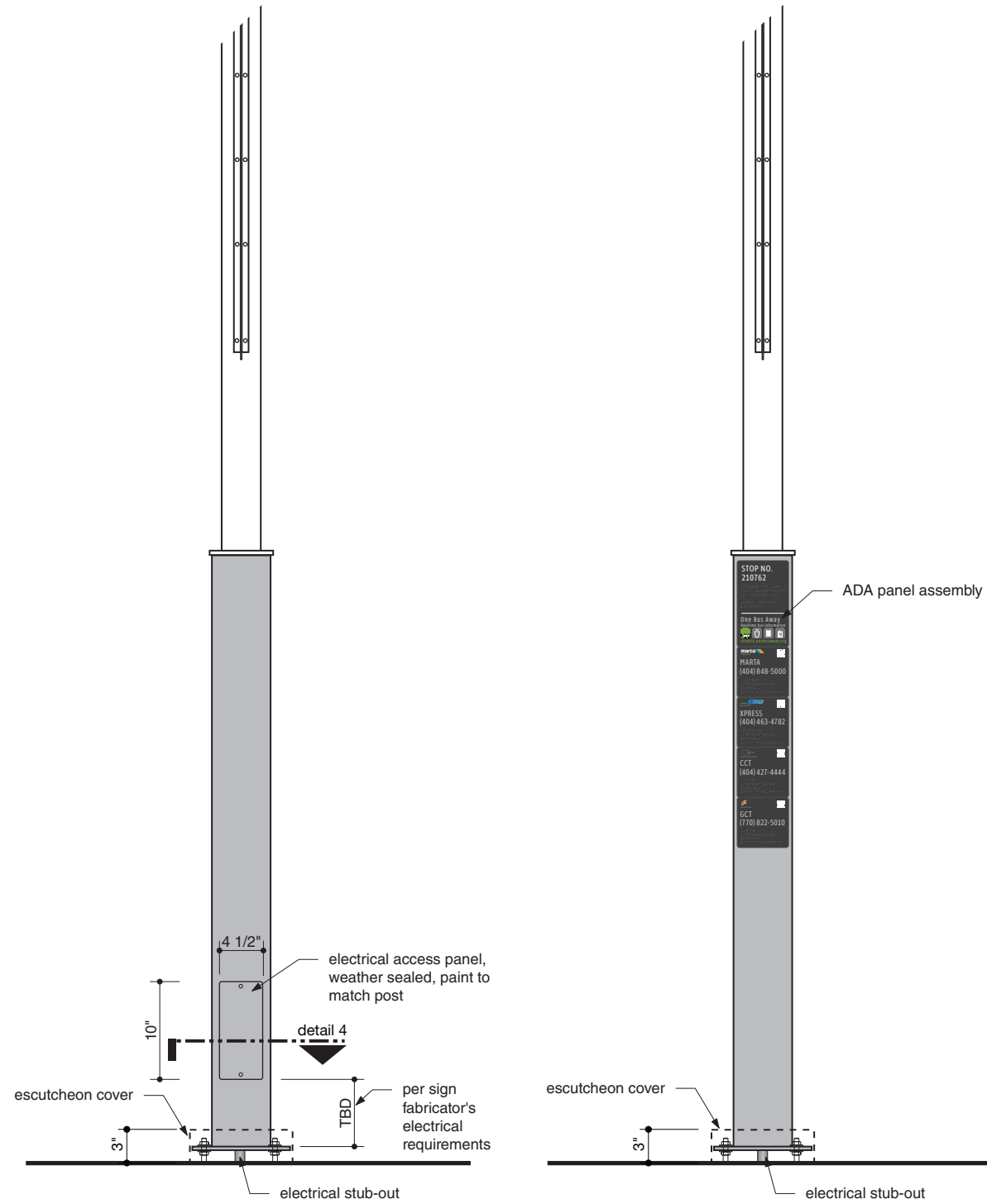
**ISSUES/REVISIONS**  
28JUN2013 Task 1, Concept Development, 30% CD's  
20AUG2013 Task 2, Schematic Design, 60% CD's  
07NOV2013 Task 3, Detail Design, 90% CD's  
20NOV2013 Task 4, Construction Documentation, 100% CD's

**PAGE TITLE / ELEMENT TYPE**  
**Sign Type 100**  
**Ground Anchoring Details**

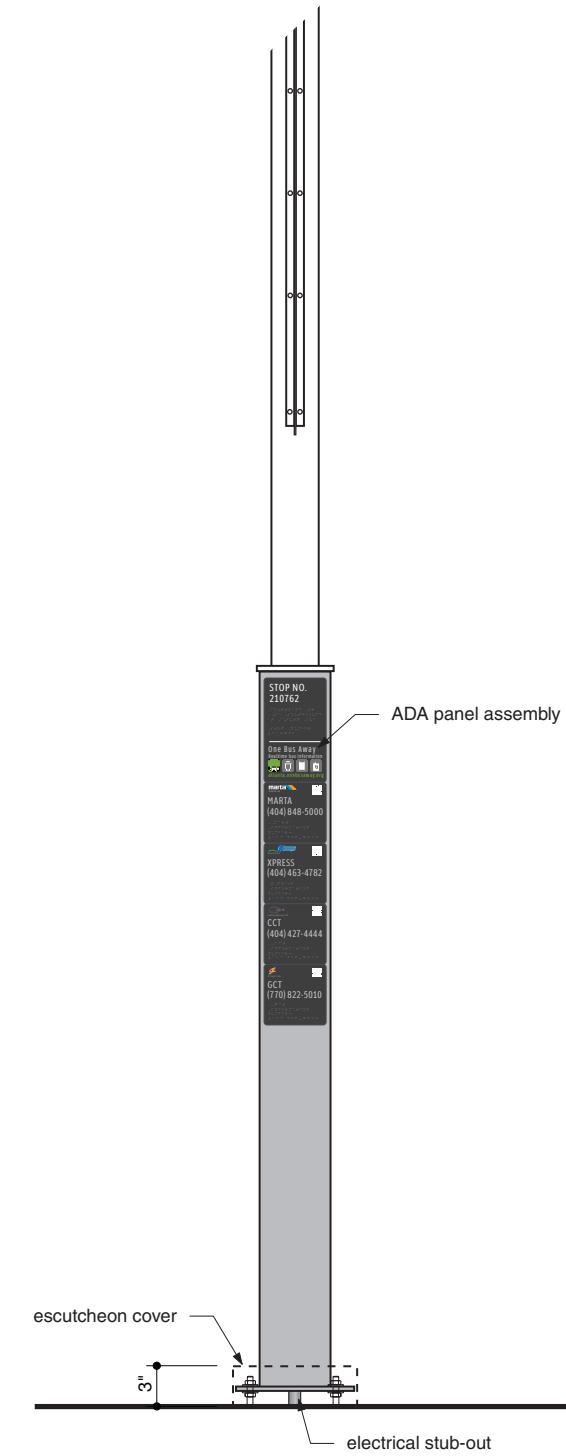
**SHEET NUMBER**  
**G17.0**



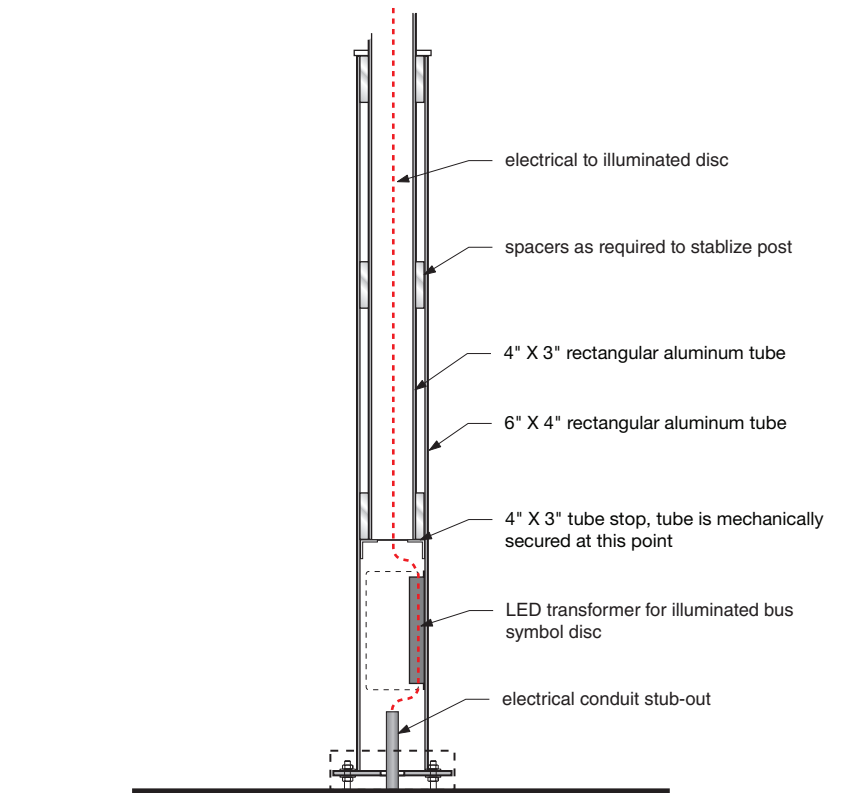
**1 Front View**  
Scale: 3/4" = 1'-0"



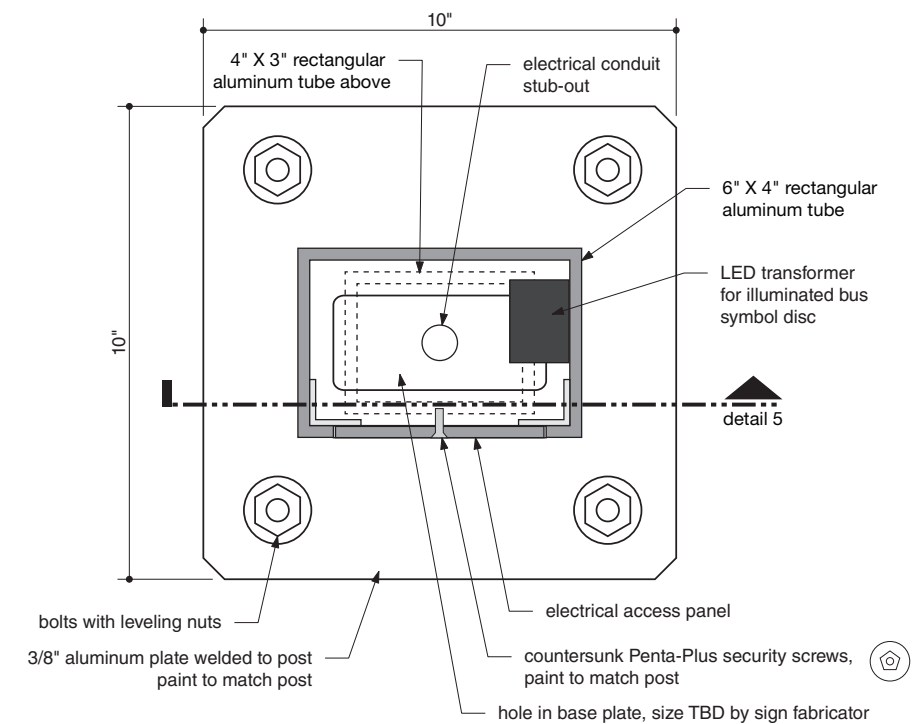
**2 View Facing Curb**  
Scale: 3/4" = 1'-0"



**3 View Facing Pedestrian Walkway**  
Scale: 3/4" = 1'-0"



**5 Section Detail**  
Scale: 3/4" = 1'-0"



**4 Section Detail**  
Scale: 3" = 1'-0"



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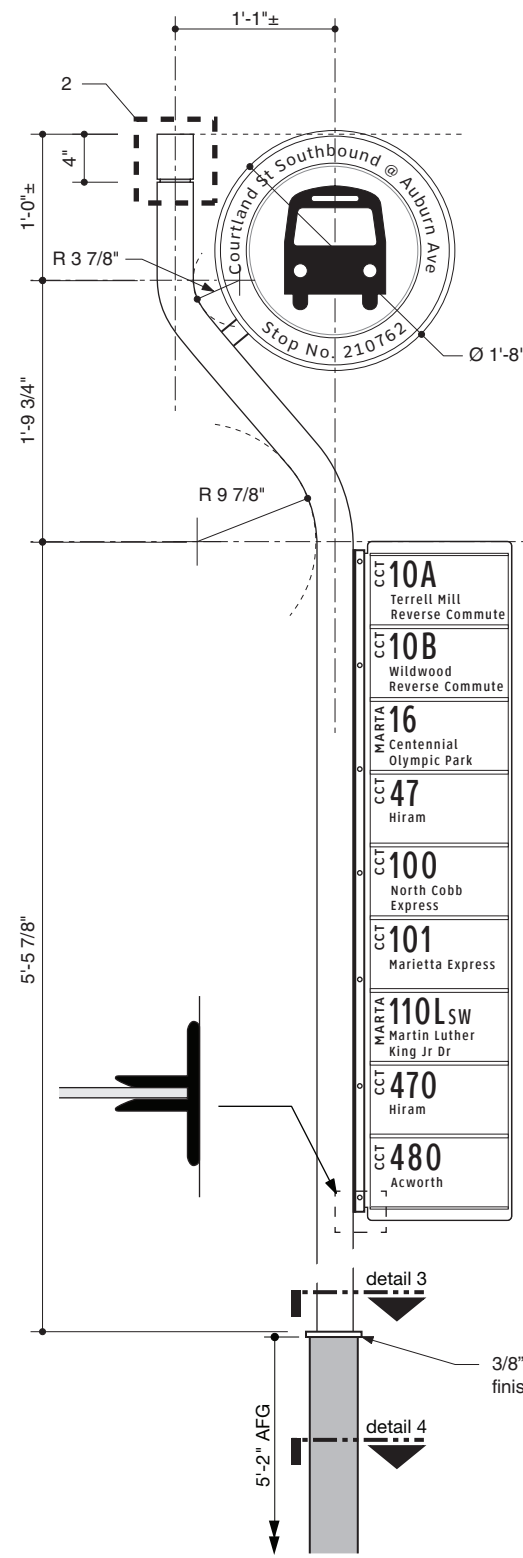
**PROJECT NAME/PROJECT CODE**  
**Atlanta Regional Commission**  
**Unified Bus Stop Signage**  
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**ISSUES/REVISIONS**

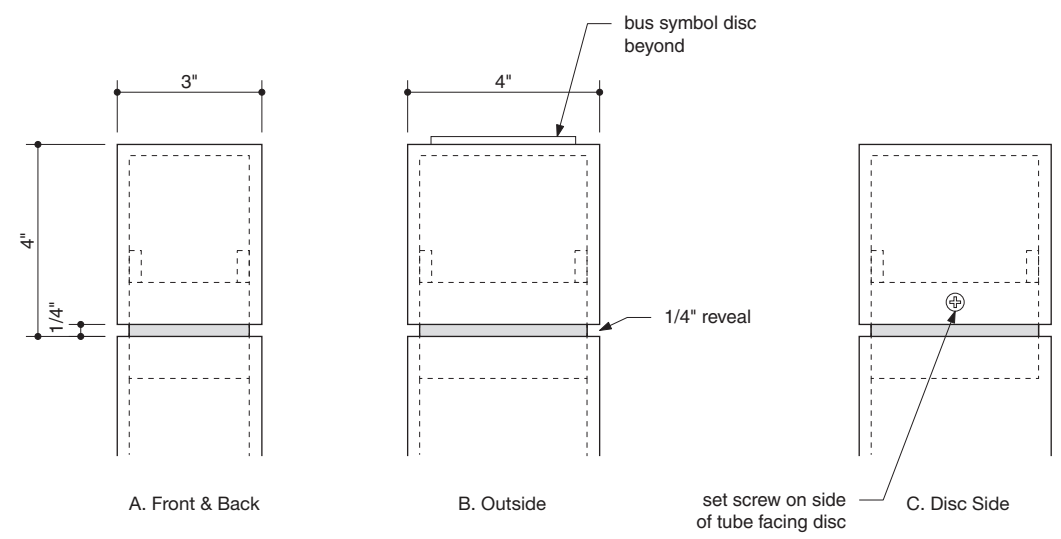
28JUN2013	Task 1, Concept Development, 30% CD's
20AUG2013	Task 2, Schematic Design, 60% CD's
07NOV2013	Task 3, Detail Design, 90% CD's
20NOV2013	Task 4, Construction Documentation, 100% CD's

**PAGE TITLE / ELEMENT TYPE**  
**Sign Type 100**  
**Base & Access Panel Details**

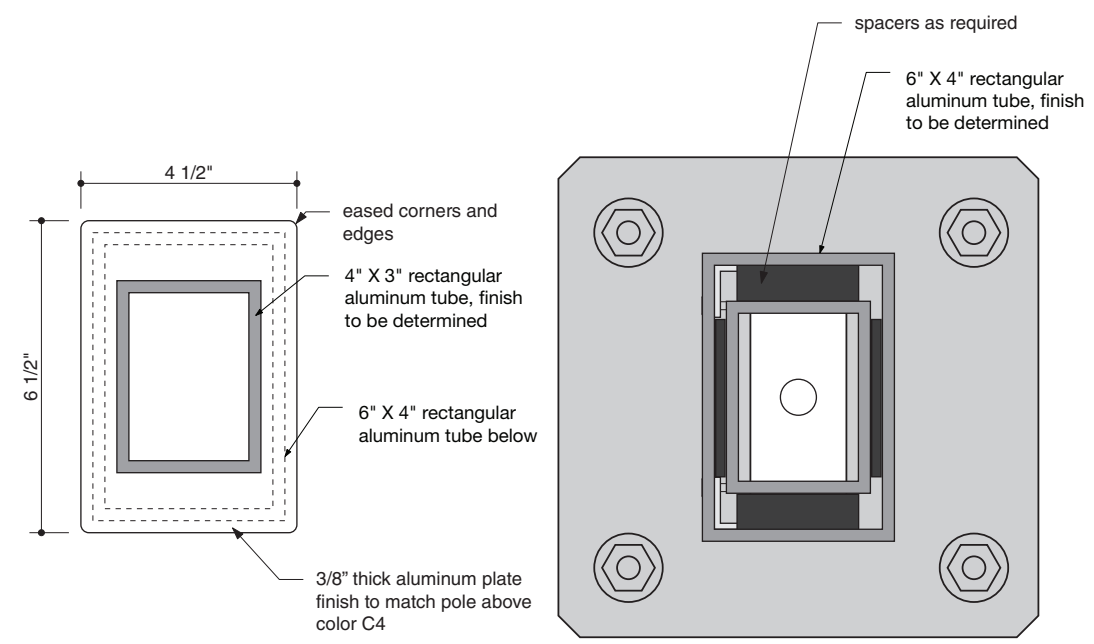
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**G18.0**



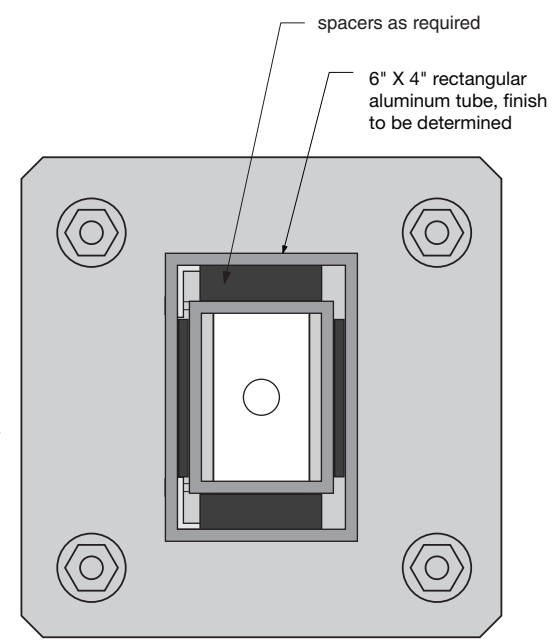
**1** Front Elevation Detail  
Scale: 3/4"=1'-0"



**2** Cap Details  
Scale: 3"=1'-0"



**3** Section Detail  
Scale: 3"=1'-0"



**4** Section Detail  
Scale: 3"=1'-0"



**5** Model Vignettes  
Scale: NTS



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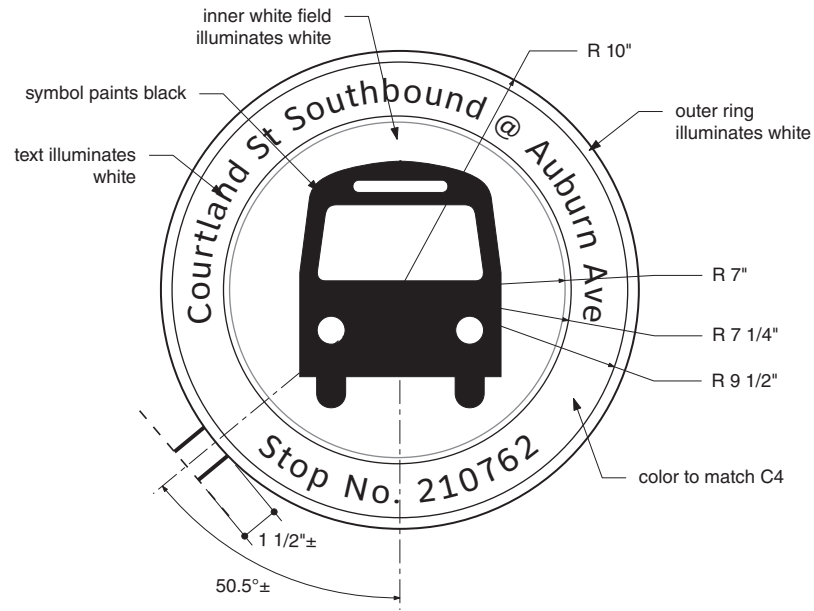
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**ISSUES/REVISIONS**  
28JUN2013 Task 1, Concept Development, 30% CD's  
20AUG2013 Task 2, Schematic Design, 60% CD's  
07NOV2013 Task 3, Detail Design, 90% CD's  
20NOV2013 Task 4, Construction Documentation, 100% CD's

**PAGE TITLE / ELEMENT TYPE**  
**Sign Type 100**  
Custom Pole and Cap Details

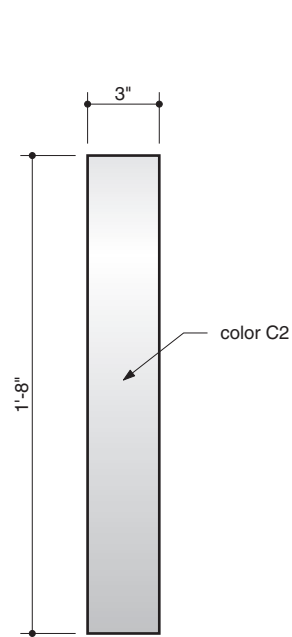
**SHEET NUMBER**  
**G19.0**



1 Disc Layout Detail  
Scale: 1 1/2"=1'-0"



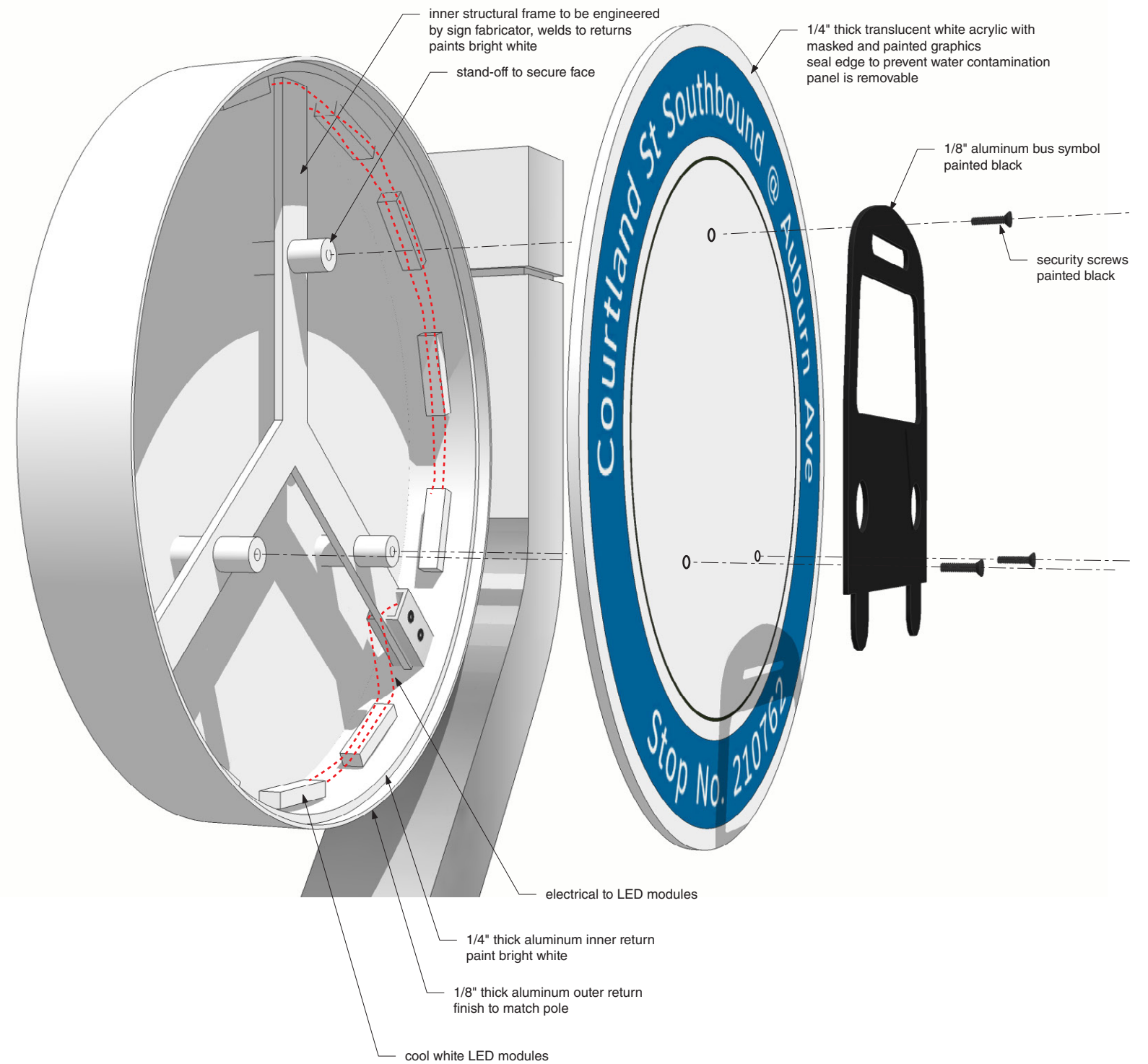
Streetcar Example



2 Disc Return  
Scale: 1 1/2"=1'-0"



3 Disc Axonometric  
Scale: NTS



4 Disc Exploded View  
Scale: NTS



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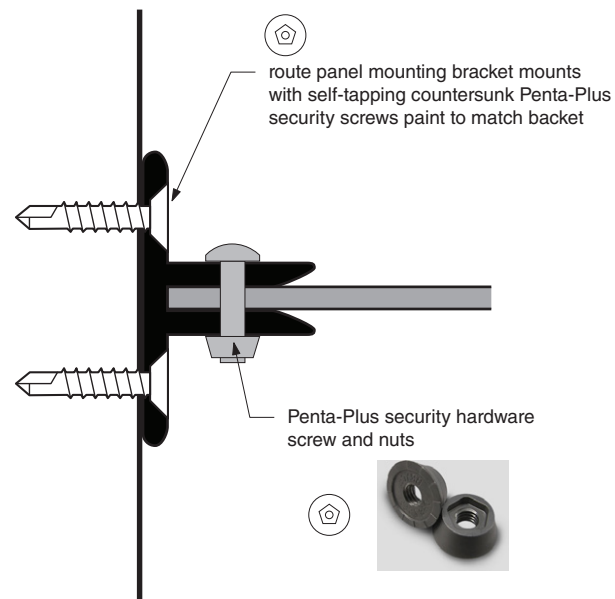
PROJECT NAME/PROJECT CODE  
**Atlanta Regional Commission  
Unified Bus Stop Signage**  
13ARC001

ISSUES/REVISIONS  
28JUN2013 Task 1, Concept Development, 30% CD's  
20AUG2013 Task 2, Schematic Design, 60% CD's  
07NOV2013 Task 3, Detail Design, 90% CD's  
20NOV2013 Task 4, Construction Documentation, 100% CD's

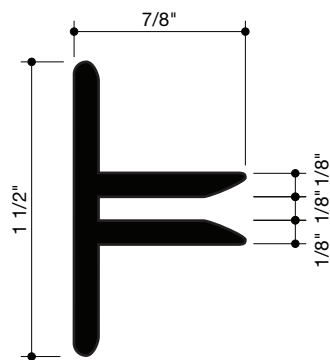
PAGE TITLE / ELEMENT TYPE  
**Sign Type 100  
Illuminated Disc Details**

SHEET NUMBER

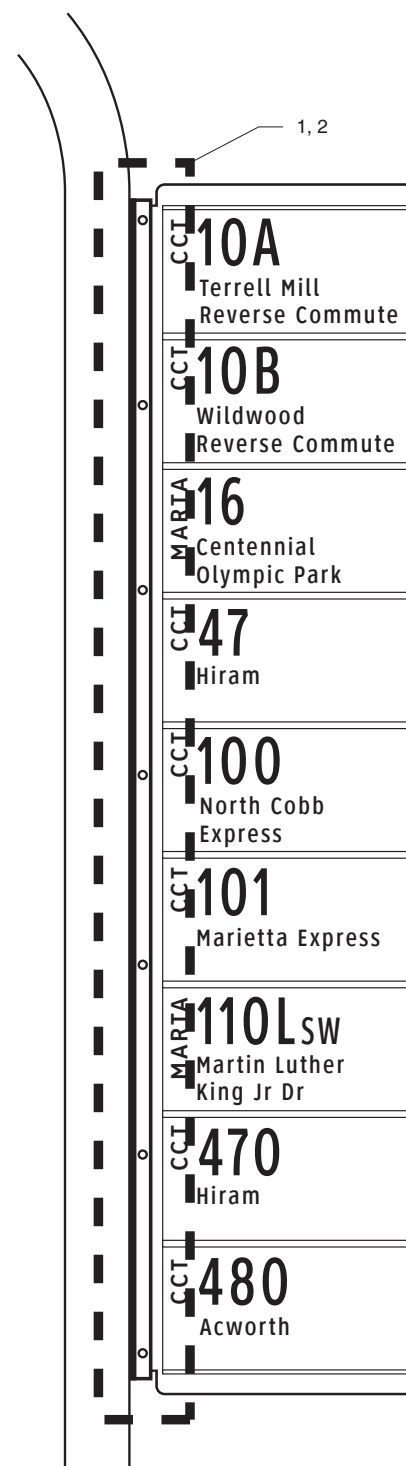
**G20.0**



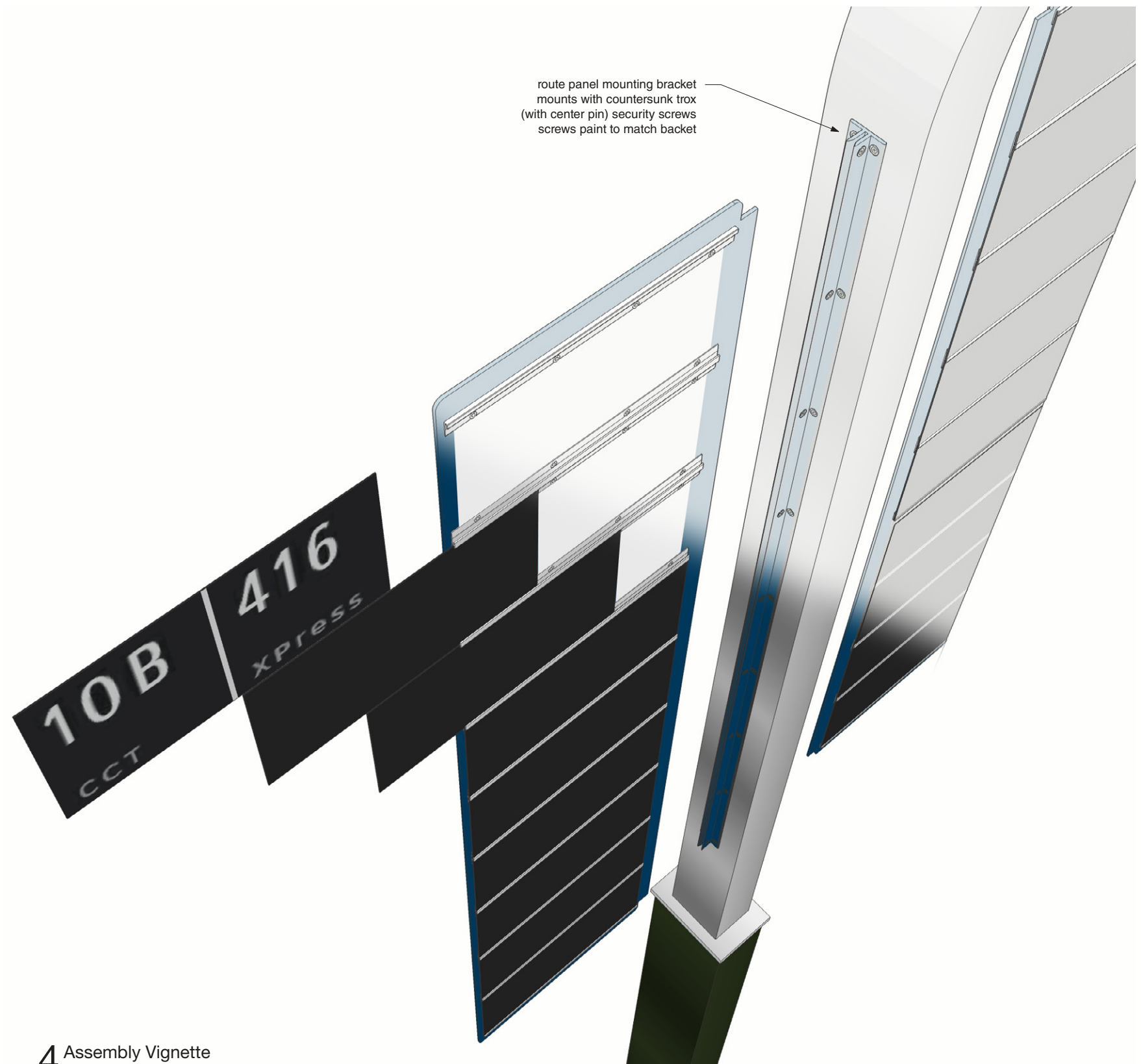
1 Route Panel Mounting Detail  
Scale: FULL



2 Mounting Bracket Detail  
Scale: FULL



3 Front Elevation  
Scale: 1 1/2"=1'-0"

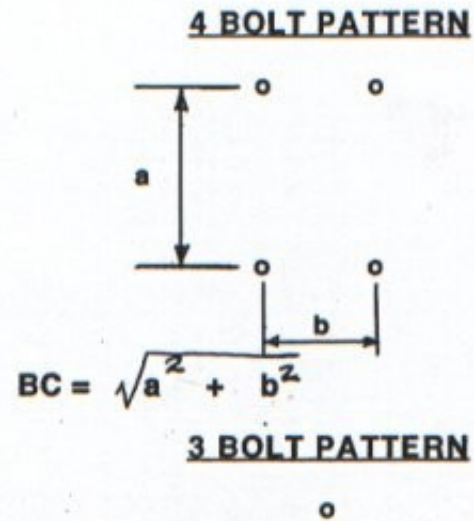


4 Assembly Vignette  
Scale: NTS



## ALLOWABLE XYZ FOR BOLTS

To determine the allowable XYZ of the bolt, the Bolt Circle (BC) needs to be determined for the sign design being evaluated. The BC for a 3 bolt or 4 bolt pattern is determined as follow:



$$BC = \frac{2a}{\sqrt{3}}$$

Once the BC is determined, the allowable XYZ can be determined from the Allowable DENT BREAKAWAY BOLT XYZ Table. (Example below)

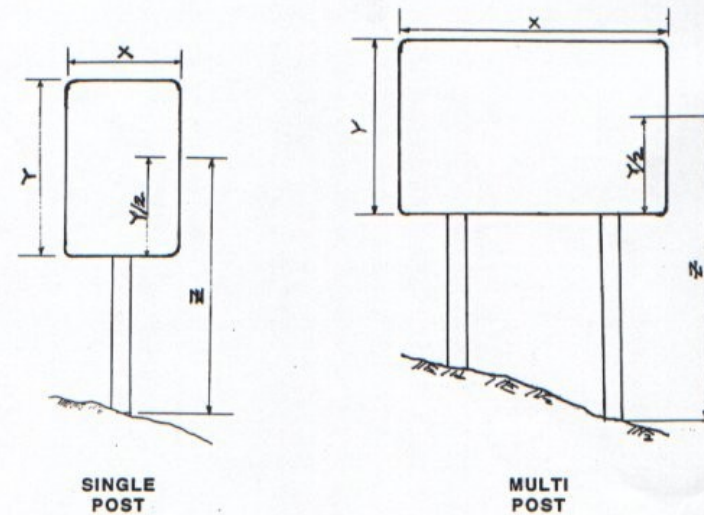
Example: Determine the Allowable XYZ for a Type B bolt, a 4 bolt base pattern, 2 post sign, 80mph wind design, with the bolt spacing of a = 6 7/8 inches and b = 3 1/4 inches.

The BC for the bolt pattern is  $\sqrt{a^2 + b^2} = \sqrt{6.875^2 + 3.25^2} = 7.6044$

From the **ALLOWABLE DENT BREAKAWAY BOLT XYZ TABLE**, the allowable XYZ is calculated by multiplying the BC by 247.7724. The allowable XYZ for the bolt would be 1884. This value is compared to the XYZ value for the sign (See XYZ Calculation for Signs). If the allowable XYZ of the bolt is greater than the XYZ of the sign, then the selected bolt is acceptable for the sign installation.

## XYZ CALCULATION FOR SIGNS

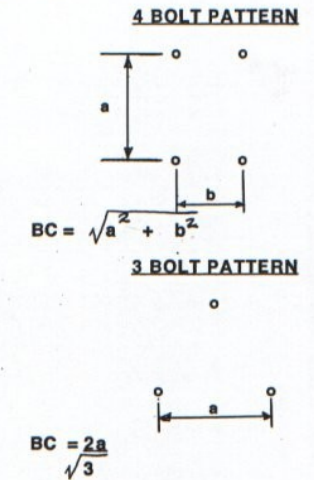
X = Width of the Sign. (in feet)  
Y = Height of the Sign. (in feet)  
Z = Distance for the ground to the middle of the Sign (use longest leg). (in feet)



The XYZ (sign) = X x Y x Z. This value is compared to the allowable XYZ of the bolts. If the allowable XYZ of the bolts is greater than the XYZ of the sign, then the selected bolt is acceptable for the sign installation.

## ALLOWABLE XYZ FOR BOLTS

To determine the allowable XYZ of the bolt, the Bolt Circle (BC) needs to be determined for the sign design being evaluated. The BC for a 3 bolt or 4 bolt pattern is determined as follow:



Once the BC is determined, the allowable XYZ can be determined from the Allowable DENT BREAKAWAY BOLT XYZ Table. (Example below)

Example: Determine the Allowable XYZ for a Type B bolt, a 4 bolt base pattern, 2 post sign, 80mph wind design, with the bolt spacing of a = 6 7/8 inches and b = 3 1/4 inches.

The BC for the bolt pattern is  $\sqrt{a^2 + b^2} = \sqrt{6.875^2 + 3.25^2} = 7.6044$

From the **ALLOWABLE DENT BREAKAWAY BOLT XYZ TABLE**, the allowable XYZ is calculated by multiplying the BC by 247.7724. The allowable XYZ for the bolt

### ALLOWABLE XYZ, TYPE B (0.380") BOLT FOR 4 BOLT BASE

(BC) = Bolt Circle in inches

WIND SPEED (mph)	1 POST	2 POSTS	3 POSTS
70	161.8105 x (BC)	323.6211 x (BC)	485.4316 x (BC)
80	123.8862 x (BC)	247.7724 x (BC)	371.6586 x (BC)
90	97.8853 x (BC)	195.7707 x (BC)	293.6561 x (BC)
100	79.2871 x (BC)	158.5742 x (BC)	237.8615 x (BC)
110	65.5265 x (BC)	131.0531 x (BC)	196.5797 x (BC)

### ALLOWABLE XYZ, TYPE A (0.280") BOLT FOR 4 BOLT BASE

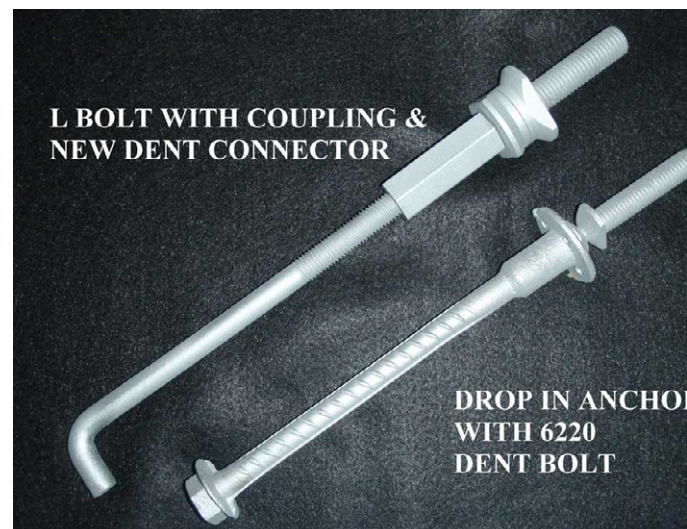
(BC) = Bolt Circle in inches

WIND SPEED (mph)	1 POST	2 POSTS	3 POSTS
70	120.1918 x (BC)	240.3836 x (BC)	360.5755 x (BC)
80	92.0218 x (BC)	184.0437 x (BC)	276.0656 x (BC)
90	72.7086 x (BC)	145.4172 x (BC)	218.1259 x (BC)
100	58.8940 x (BC)	117.7880 x (BC)	176.6820 x (BC)
110	48.6727 x (BC)	97.3454 x (BC)	146.0181 x (BC)

### ALLOWABLE XYZ, TYPE C (0.180") BOLT FOR 4 BOLT BASE

(BC) = Bolt Circle in inches

WIND SPEED (mph)	1 POST	2 POSTS	3 POSTS
70	34.566 x (BC)	69.133 x (BC)	103.699 x (BC)
80	26.465 x (BC)	52.930 x (BC)	79.395 x (BC)
90	20.910 x (BC)	41.821 x (BC)	62.731 x (BC)
100	16.937 x (BC)	33.875 x (BC)	50.812 x (BC)
110	13.998 x (BC)	27.996 x (BC)	41.994 x (BC)

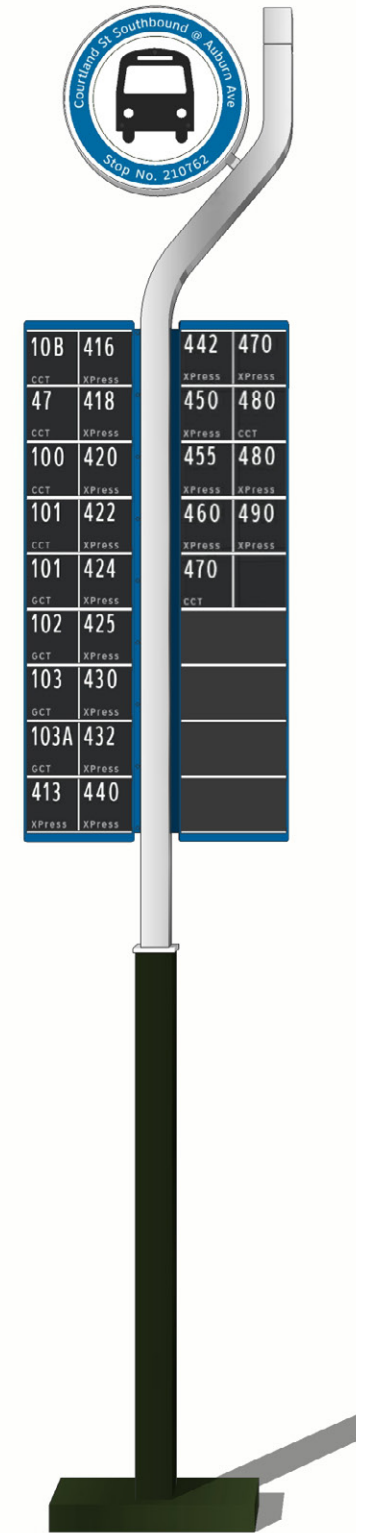




1 Model Vignette  
Scale: NTS



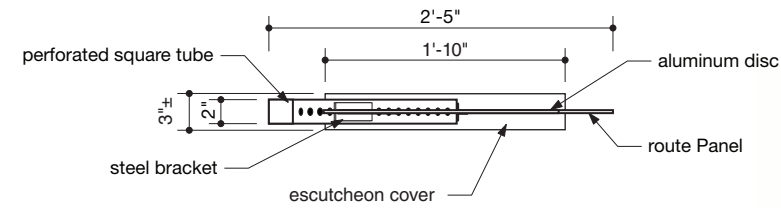
2 Model Vignette  
Scale: NTS



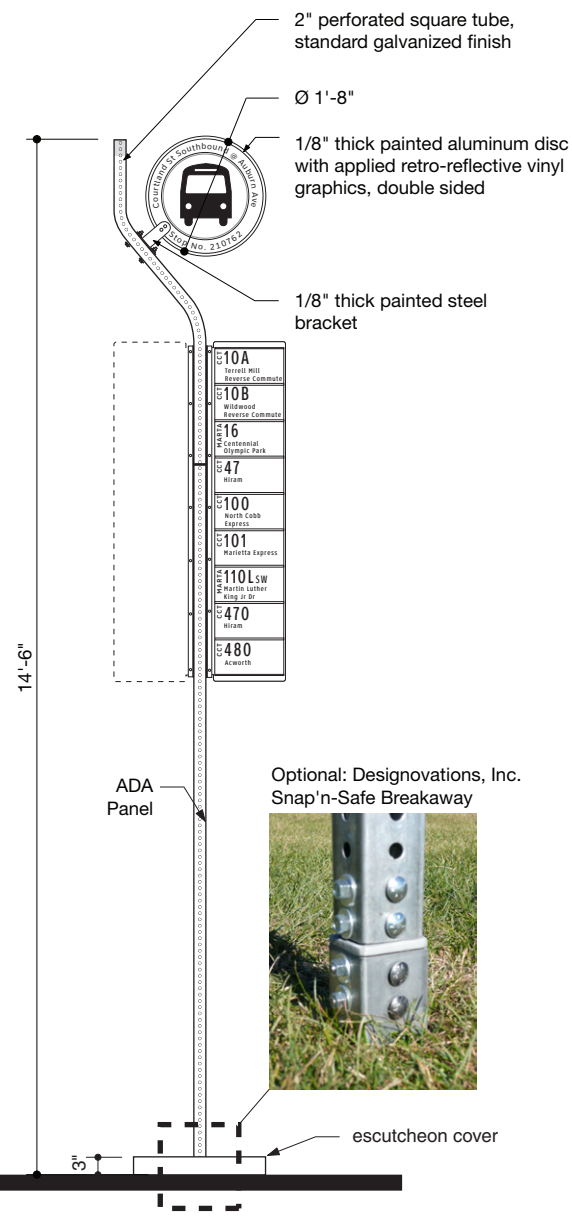
3 Model Vignette  
Scale: NTS



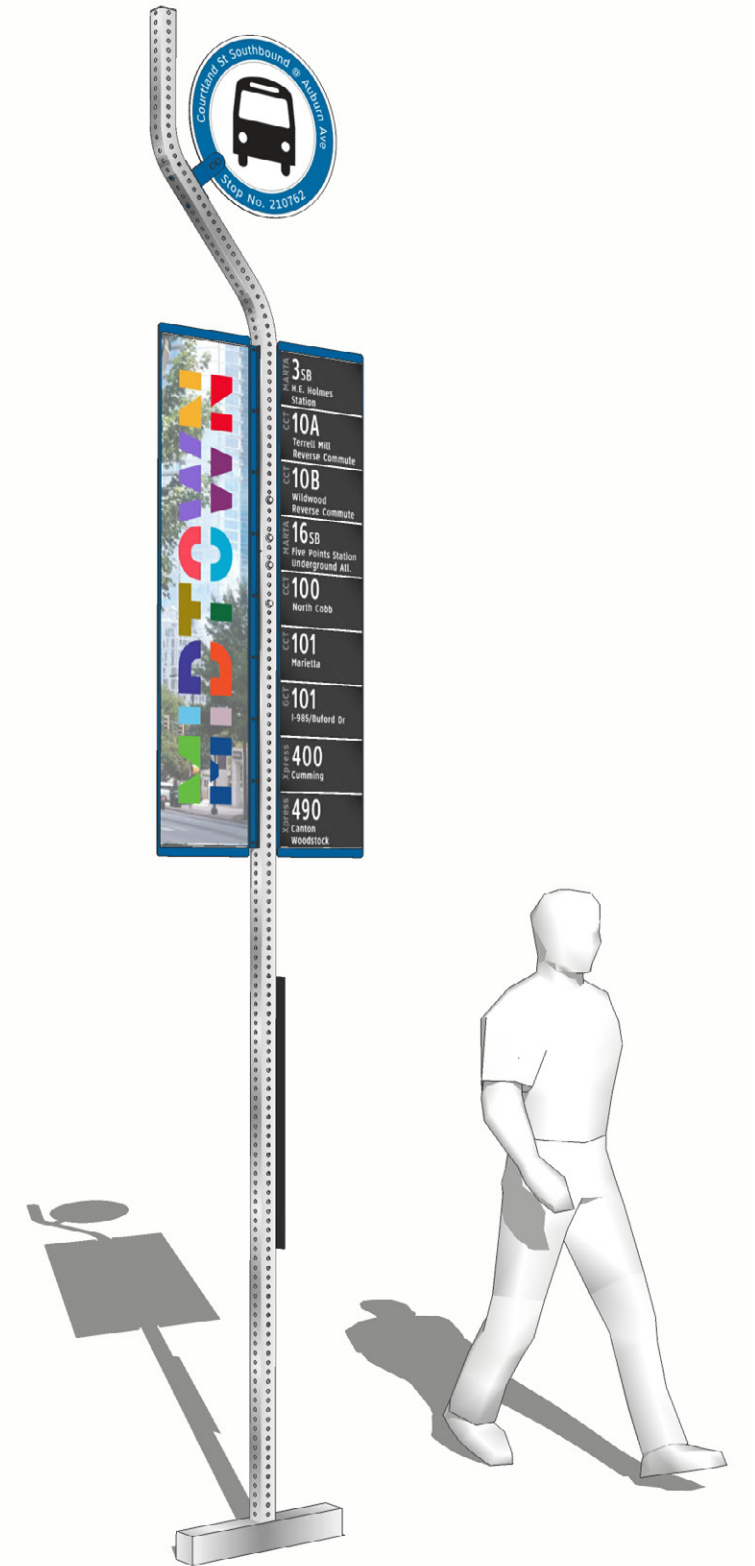
1 Front Elevation  
Scale: 3/8"=1'-0"



3 Plan View  
Scale: 3/4"=1'-0"



2 Front Elevation  
Scale: 3/8"=1'-0"



4 Model Vignette  
Scale: NTS



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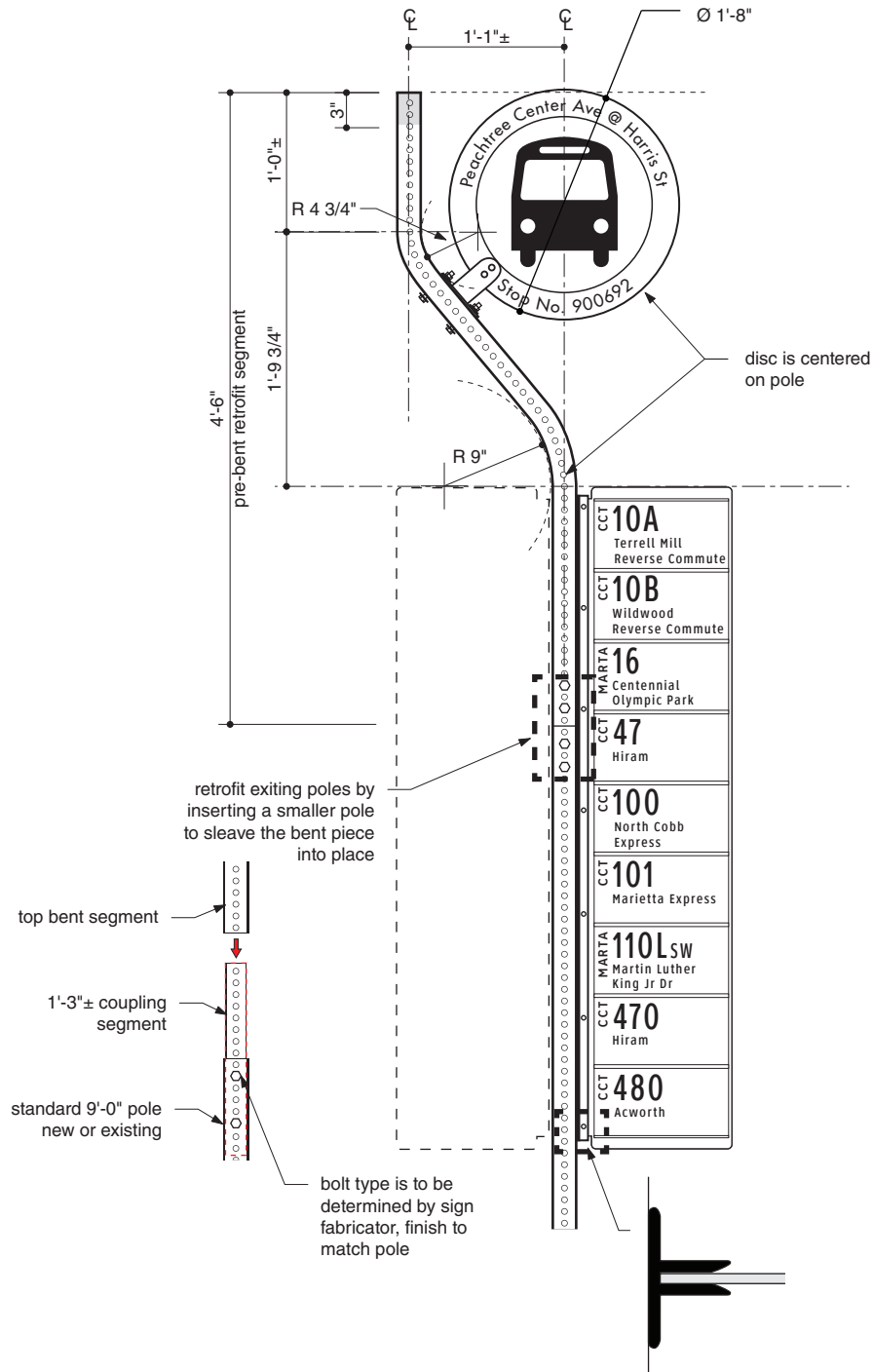
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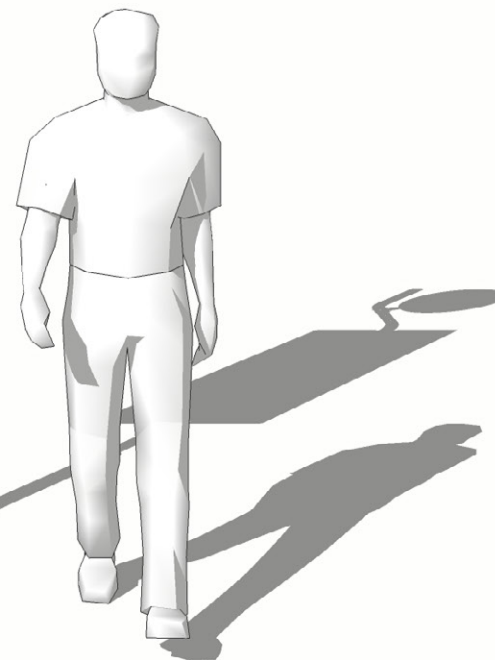
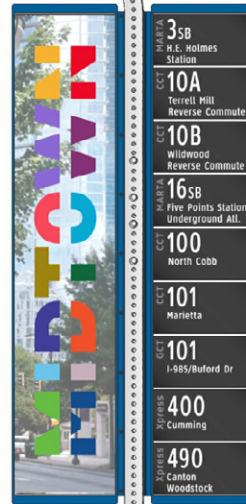
**ISSUES/REVISIONS**  
28JUN2013 Task 1, Concept Development, 30% CD's  
20AUG2013 Task 2, Schematic Design, 60% CD's  
07NOV2013 Task 3, Detail Design, 90% CD's  
20NOV2013 Task 4, Construction Documentation, 100% CD's

**PAGE TITLE / ELEMENT TYPE**  
**Sign Type 101**  
**Perforated Square Pole**

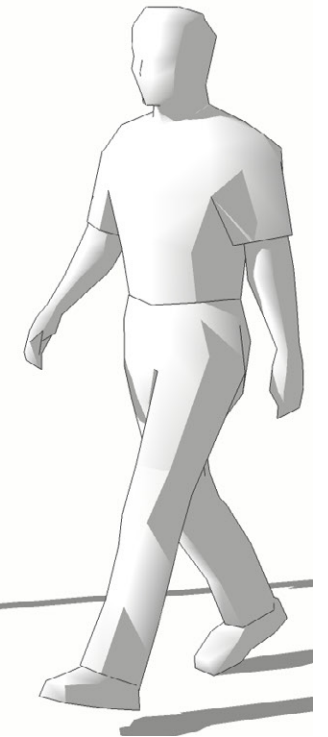
**SHEET NUMBER**  
**G24.0**



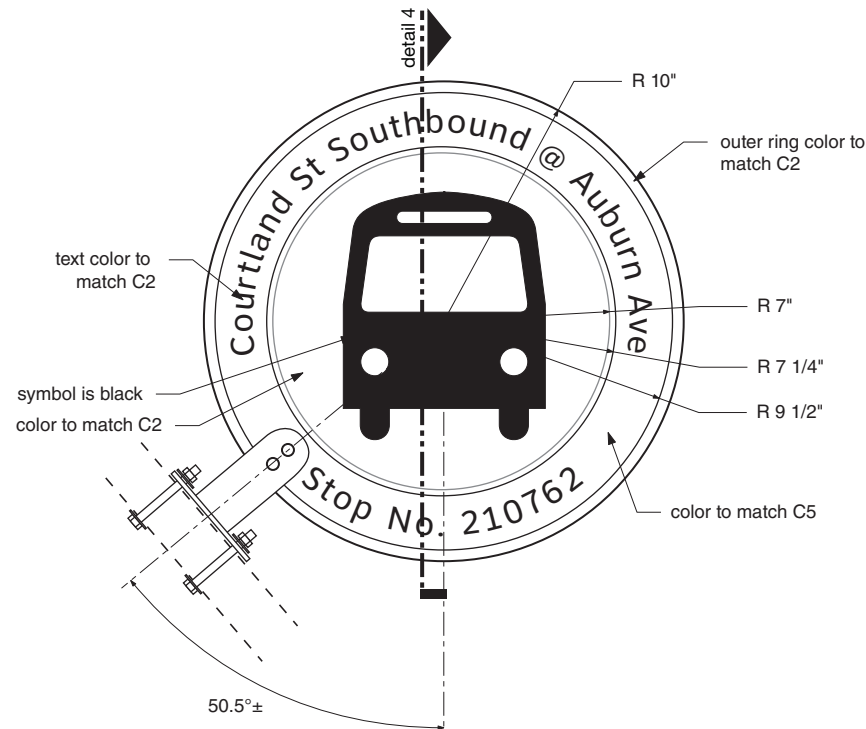
**1** Front Elevation  
Scale: 3/4"=1'-0"



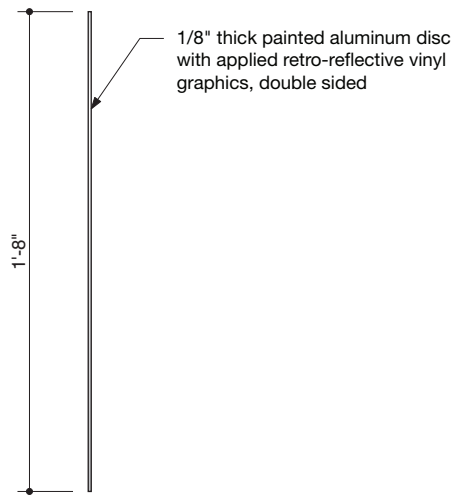
**2** Model Vignette  
Scale: NTS



**3** Model Vignette  
Scale: NTS



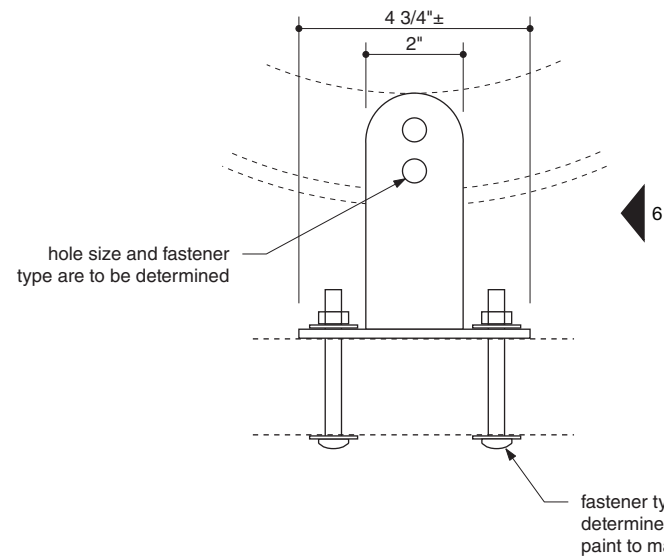
**1** Disc Layout Detail: Option 1  
Scale: 1 1/2"=1'-0"



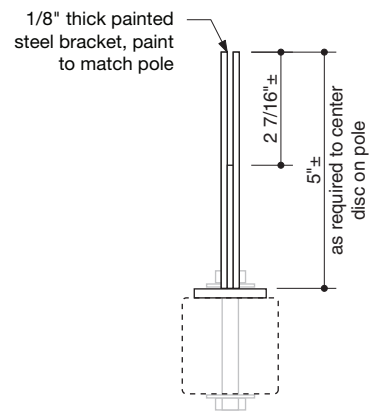
**3** Disc Return  
Scale: 1 1/2"=1'-0"



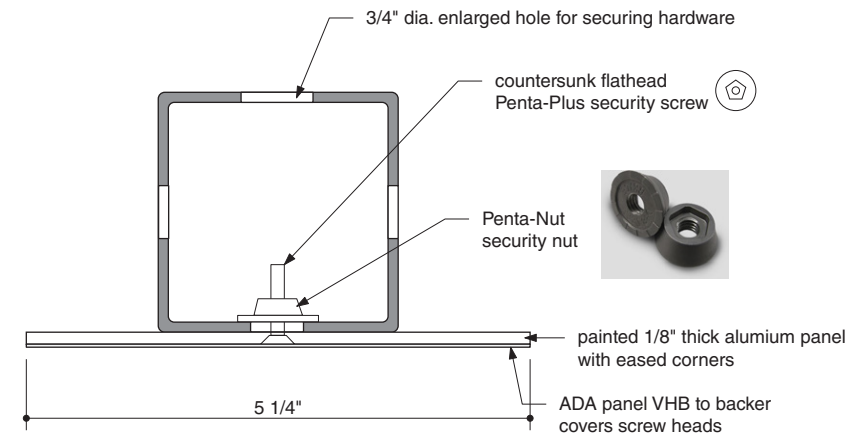
**4** Model Vignette  
Scale: NTS



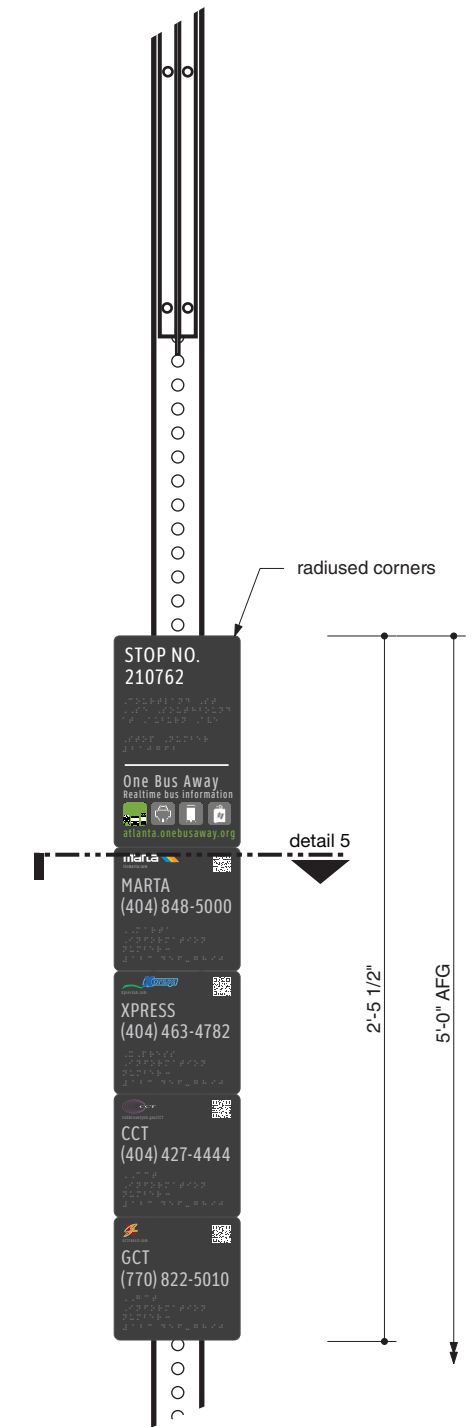
**5** Disc Bracket Front Detail  
Scale: 3"=1'-0"



**6** Disc Bracket End Detail  
Scale: 3"=1'-0"



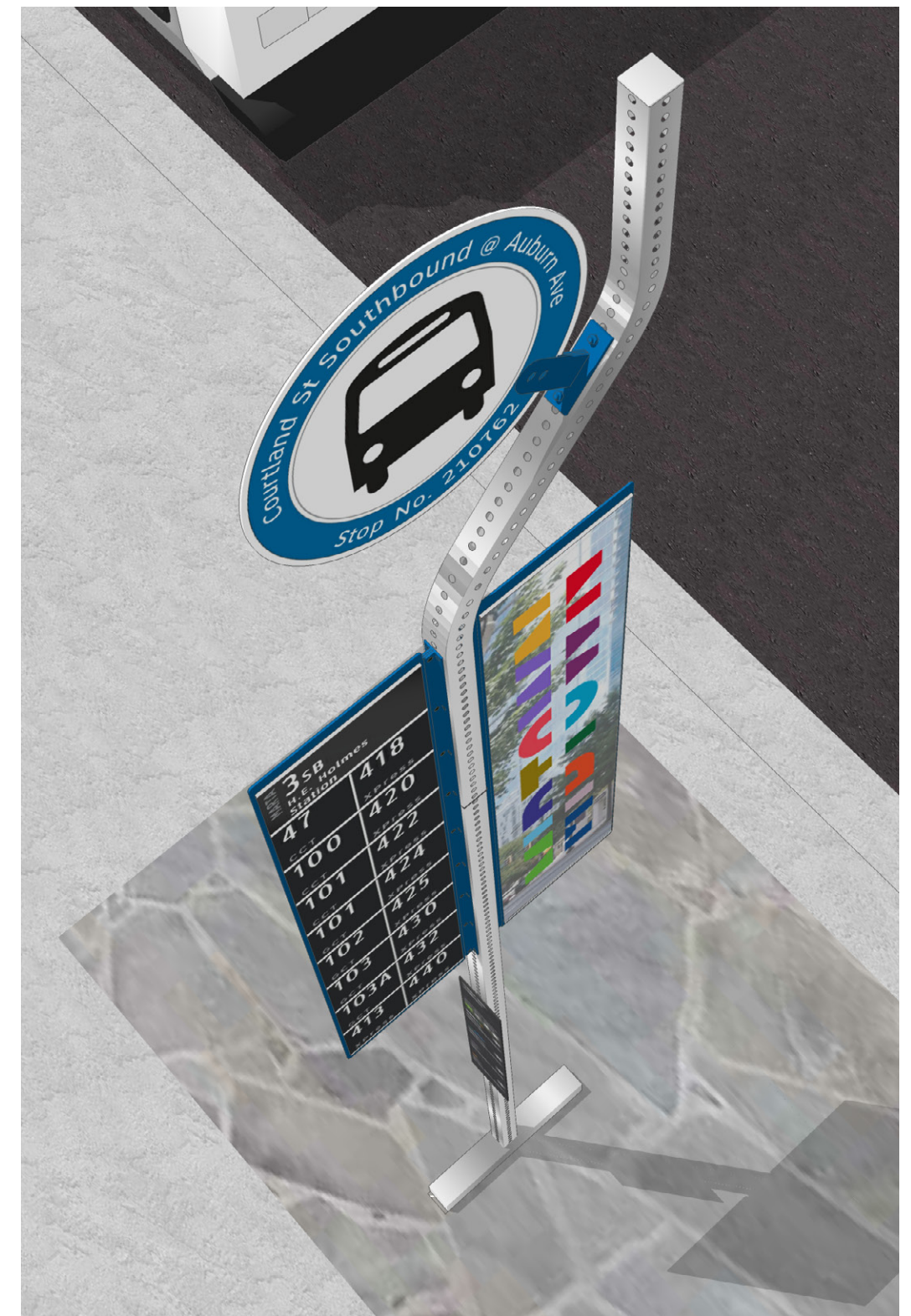
**5** ADA Panel Mounting Detail  
Scale: HALF



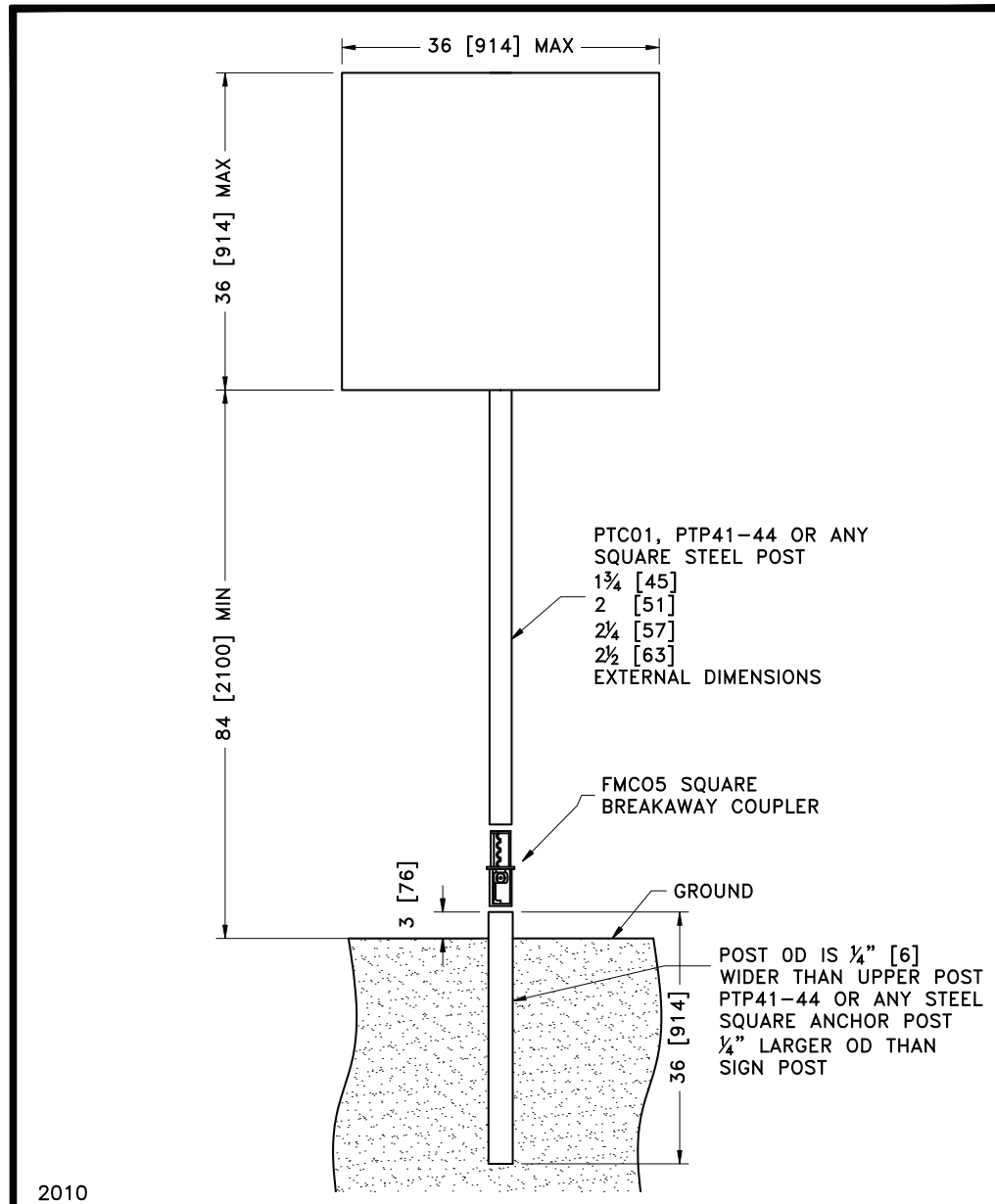
**6** ADA Panel Front View  
Scale: 1 1/2"=1'-0"



1 Model Vignette  
Scale: NTS



2 Model Vignette  
Scale: NTS



2010  
SNAP'n SAFE SQUARE SIGN POST  
GROUND MOUNT BREAKAWAY SYSTEM

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	SHEET NO.	REF. NO.
	1 of 1	DV-42

### SYSTEM SPECIFICATIONS

#### SPECIFICATIONS

The SNAP'n SAFE Square Sign Post Ground Mount Breakaway System meets the requirements for the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals. The ground mount SNAP'n SAFE breakaway coupler mounts is used in conjunction with a ground anchor post. Simply insert the SNAP'n SAFE coupler into the anchor post and secure with two curved bolts and nuts. Next, slide the sign post on top of the coupler and secure with two curved bolts and nuts. At impact, the sign post breaks away at the coupling and does not strike the roof or windshield of the vehicle. In addition, the anchor post is not damaged and can be reused.

Dimensional tolerances not shown or implied are intended to be those consistent with the proper functioning of the part, including its appearance and accepted manufacturing practices.

#### COMPONENTS

The SNAP'n SAFE square sign post system consists of a PTC01, PTP41-44 or any square 1 3/4" [44 mm], 2" [51 mm], 2 1/4" [57 mm] or 2 1/2" [64 mm] steel post, any square 2" [51 mm], 2 1/4" [57 mm], or 2 1/2" [64 mm], or 2 3/4" [69 mm] x 36" [914 mm] length steel anchor post, a sign panel and attachment hardware, one FMC05 coupler, two curved bolts either 5/16" x 1 3/4" [8 x 44 mm], 5/16" x 2" [8 x 51 mm], 5/16" x 2 1/4" [8 x 57 mm], 5/16" x 2 1/2" [8 x 64 mm], two curved bolts either 5/16" x 2" [8 x 51 mm], 5/16" x 2 1/4" [8 x 57 mm], 5/16" x 2 1/2" [8 x 64 mm] or two 3/8" x 1" [9.5x 25.4] hex bolts, four FWC08 washers and four 5/16" [8 mm] nuts.

#### ACCEPTANCE

John R. Baxter, Letter to Jim Anderson, Geometric and Roadside Design Acceptance Letter HSA-10/SS-120, Federal Highway Administration, Washington, D.C., April 1, 2004.

John R. Baxter, Letter to Jim Anderson, Geometric and Roadside Design Acceptance Letter HSA-10/SS-123, Federal Highway Administration, Washington, D.C., April 1, 2004.

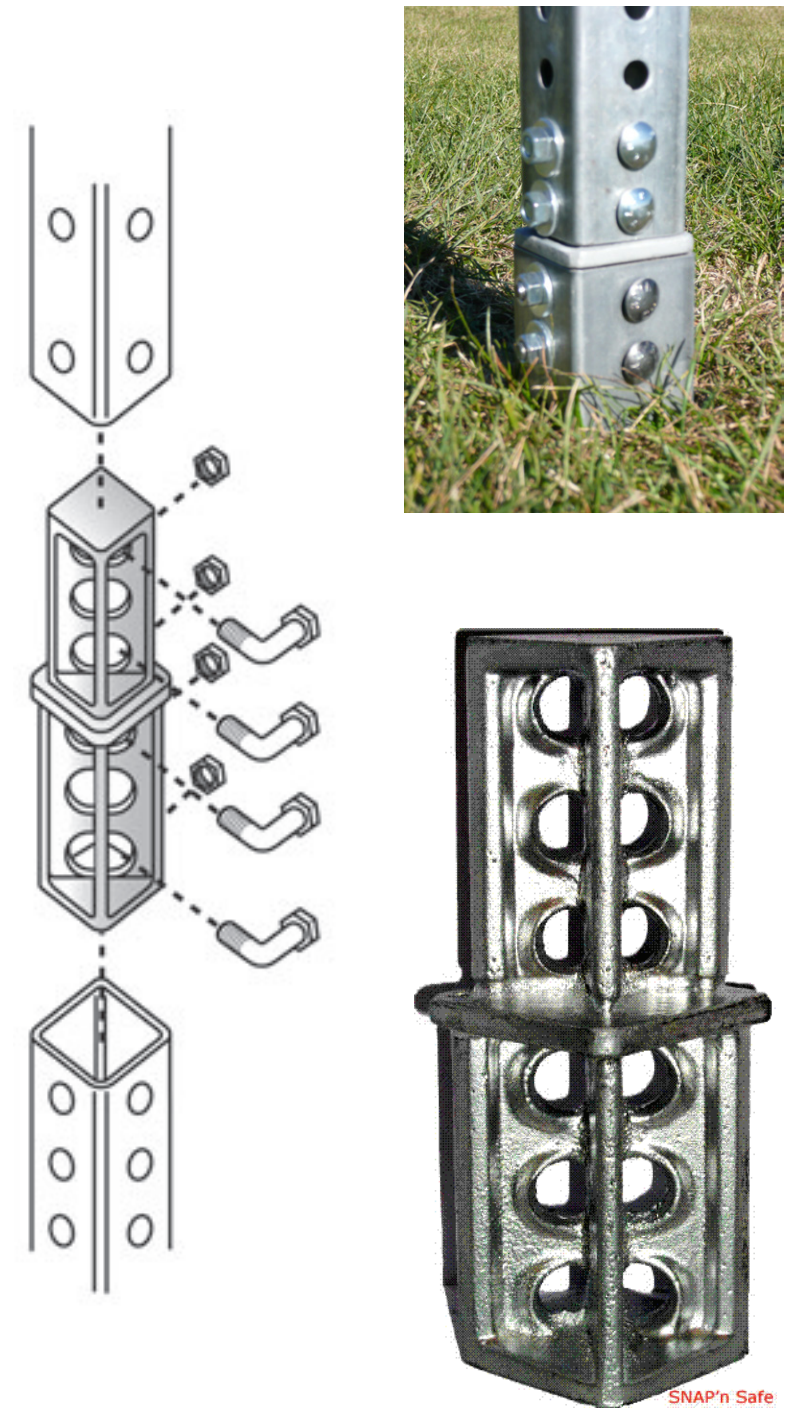
John R. Baxter, Letter to Jim Anderson, Geometric and Roadside Design Acceptance Letter HSSD-10/SS-1203 amendment#1, Federal Highway Administration, Washington, D.C., February 28, 2007.

#### CONTACT INFORMATION

Designovations, Inc.  
 7339 Wildwood Road  
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 Website: [www.designovations.com](http://www.designovations.com)

**SNAP'n SAFE Square Sign Post Ground Mount Breakaway System**

<b>SSC16a</b>		<b>DESIGNOVATIONS, INC.</b> 7339 WILDWOOD ROAD • STILLMAN VALLEY, IL 61084 PHONE: 888-868-6588 • FAX: 815-645-2389 EMAIL: sales@designovations.com • www.designovations.com
SHEET NO.	DATE	
1 of 1	09-28-10	



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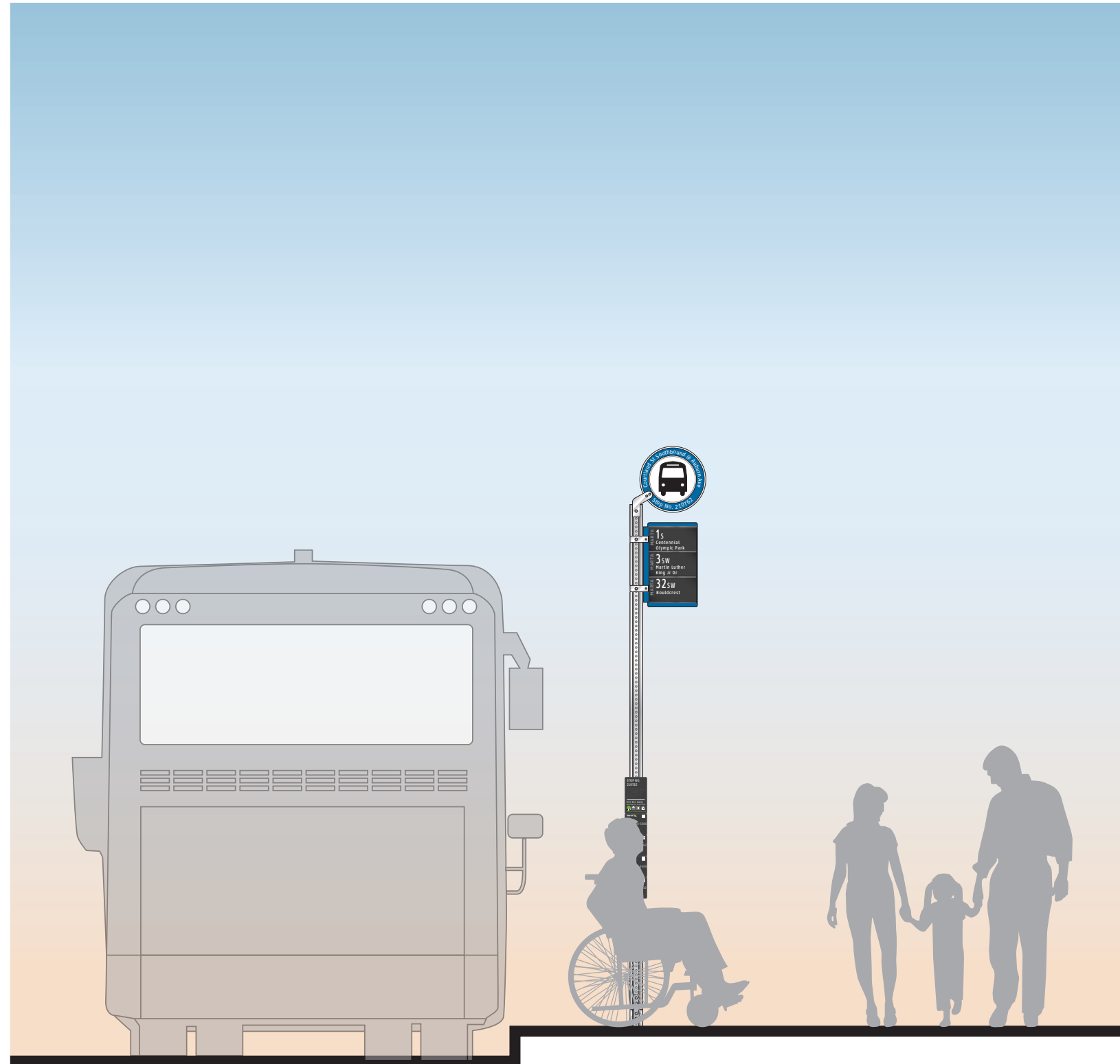
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PROJECT NAME/PROJECT CODE  
**Atlanta Regional Commission**  
**Unified Bus Stop Signage**  
 13ARC001

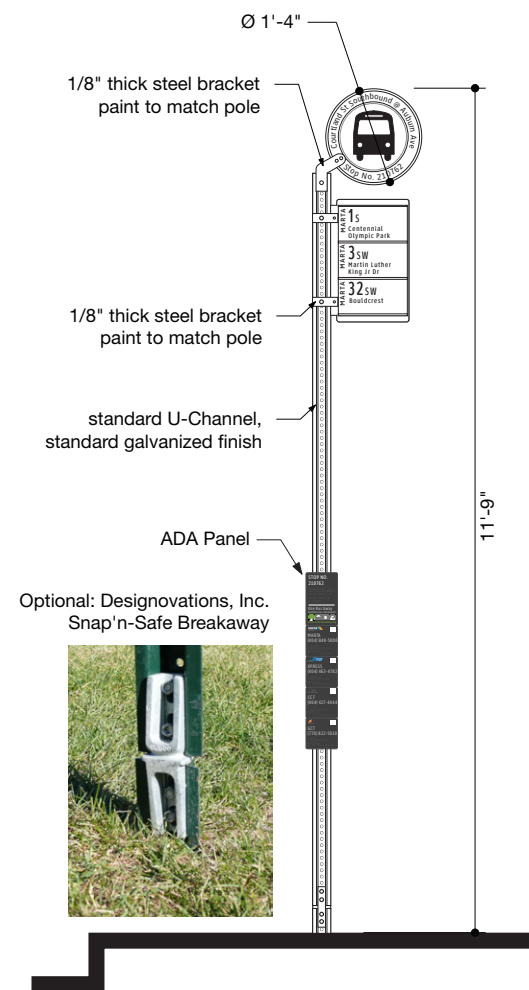
ISSUES/REVISIONS  
 28JUN2013 Task 1, Concept Development, 30% CD's  
 20AUG2013 Task 2, Schematic Design, 60% CD's  
 07NOV2013 Task 3, Detail Design, 90% CD's  
 20NOV2013 Task 4, Construction Documentation, 100% CD's

PAGE TITLE / ELEMENT TYPE  
**Sign Type 101**  
**Perforated Square Pole**  
**Breakaway Cut Sheet**

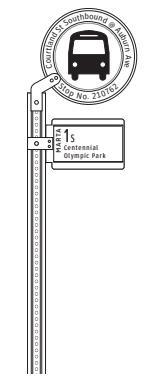
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**G28.0**



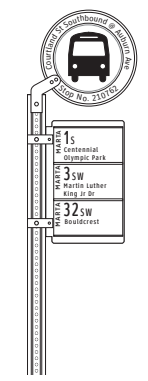
**1** Front Elevation  
Scale: 3/8"=1'-0"



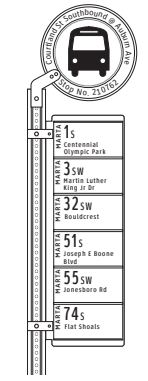
**2** Front Elevation  
Scale: 3/8"=1'-0"



SINGLE PANEL



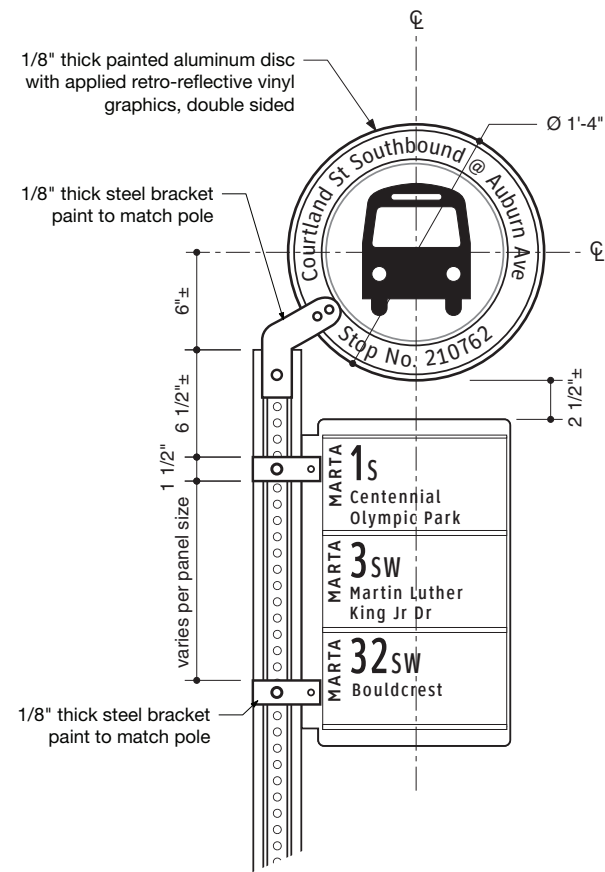
SMALL PANEL



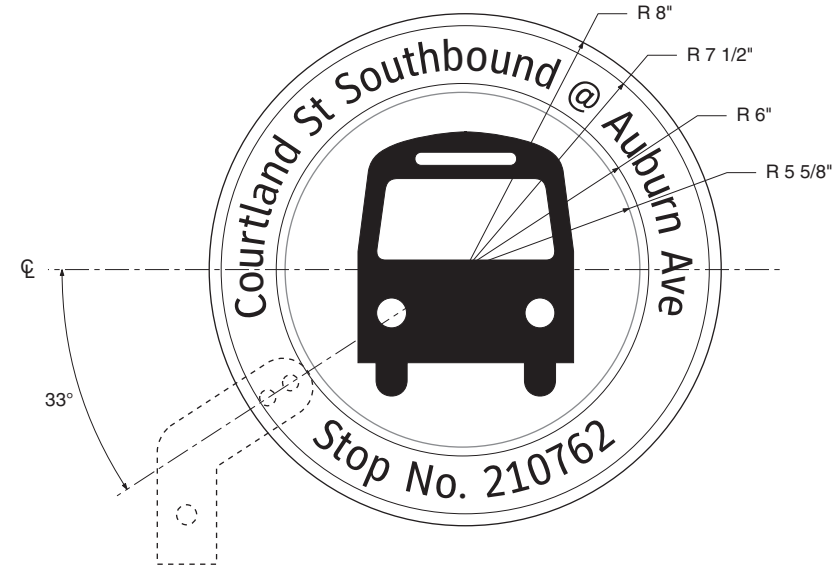
MEDIUM PANEL

**3** Panel Variations  
Scale: 3/8"=1'-0"

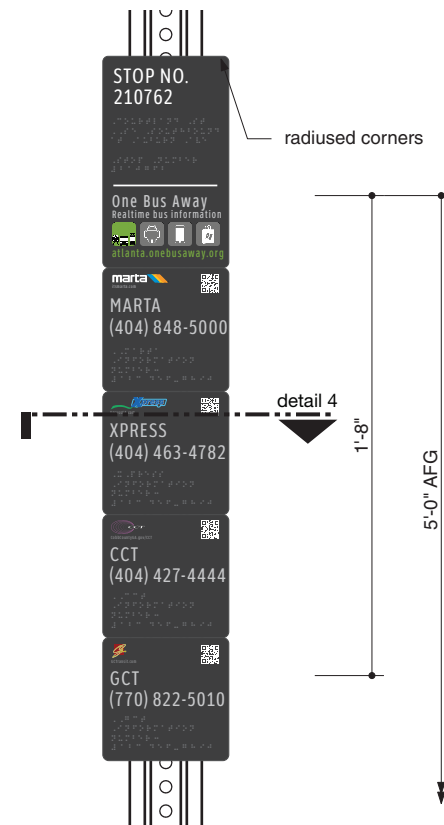




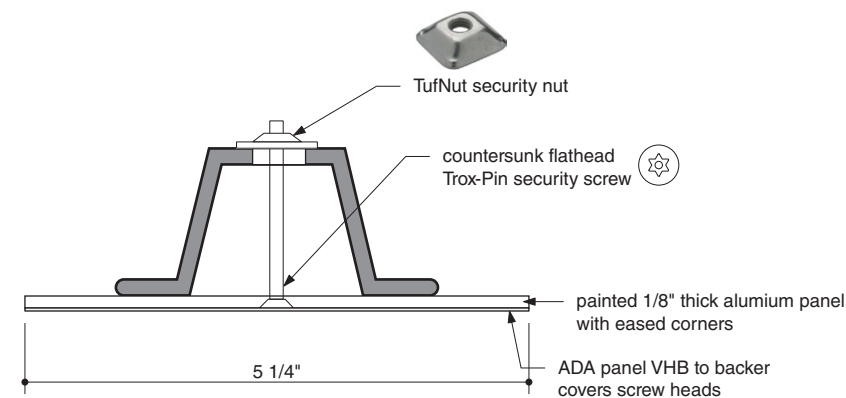
**1** Detail Elevation  
Scale: 1"=1'-0"



**2** Disc Layout Detail: Option 1  
Scale: 1:6



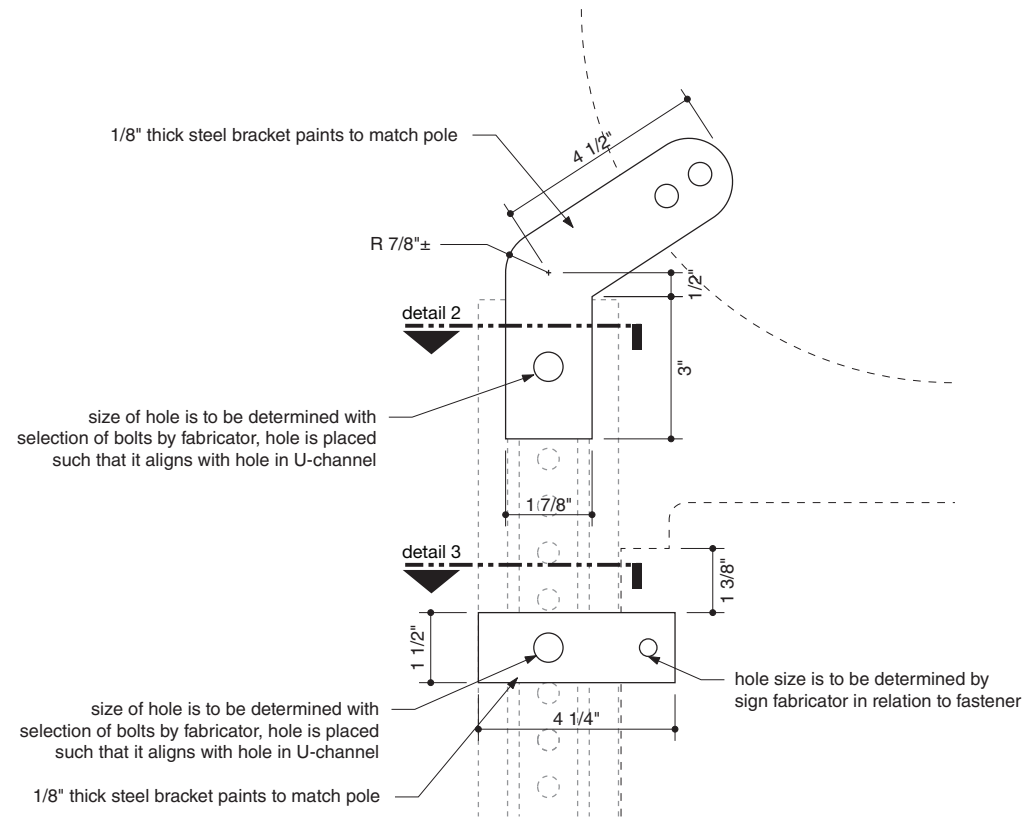
**3** ADA Panel Front View  
Scale: 1 1/2" = 1'-0"



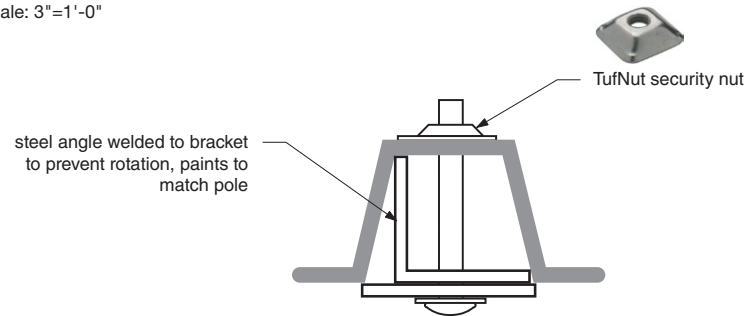
**4** ADA Panel Mounting Detail  
Scale: HALF



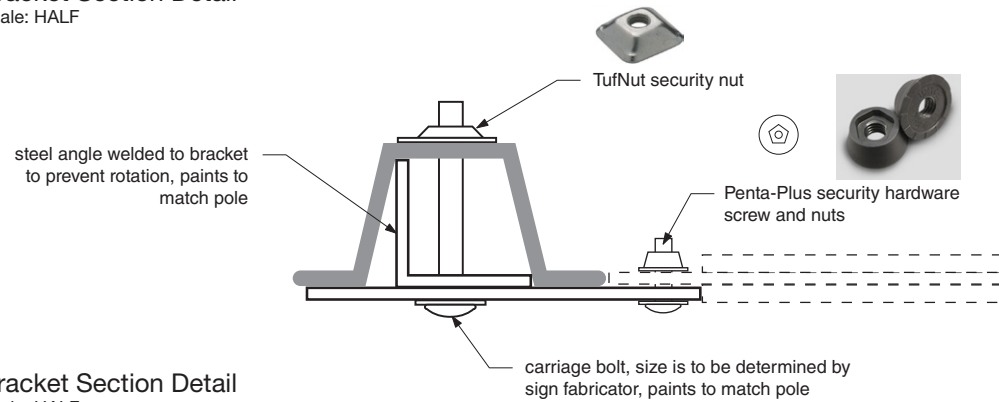
**5** Model Vignette  
Scale: NTS



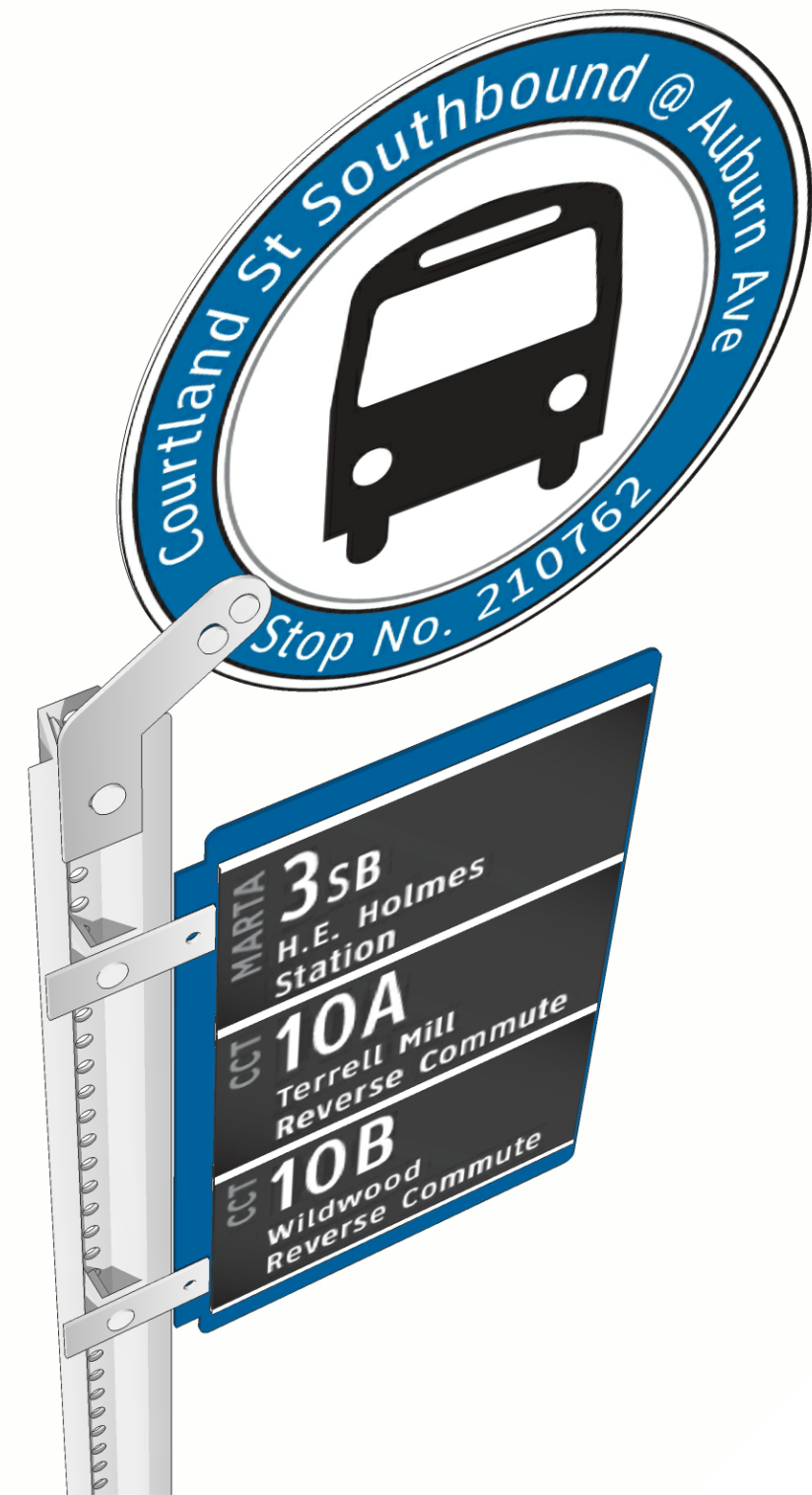
**1 Bracket Details**  
Scale: 3"=1'-0"



**2 Bracket Section Detail**  
Scale: HALF



**3 Bracket Section Detail**  
Scale: HALF



**4 Model Vignette**  
Scale: NTS



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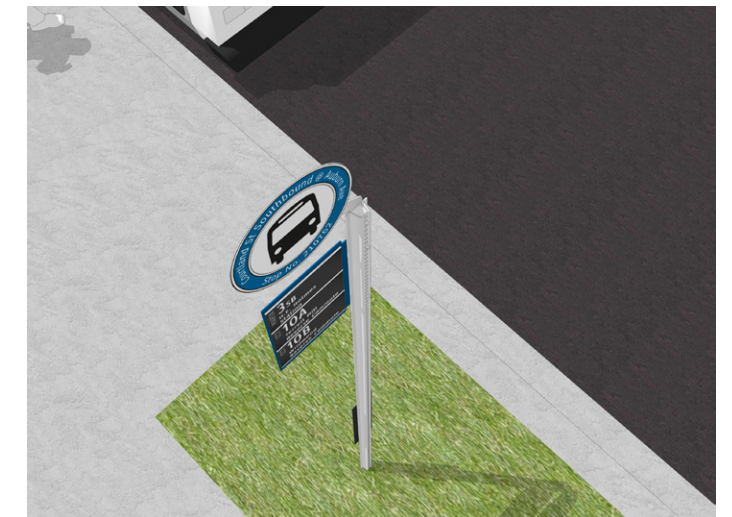
PROJECT NAME/PROJECT CODE  
**Atlanta Regional Commission  
Unified Bus Stop Signage**  
13ARC001

ISSUES/REVISIONS

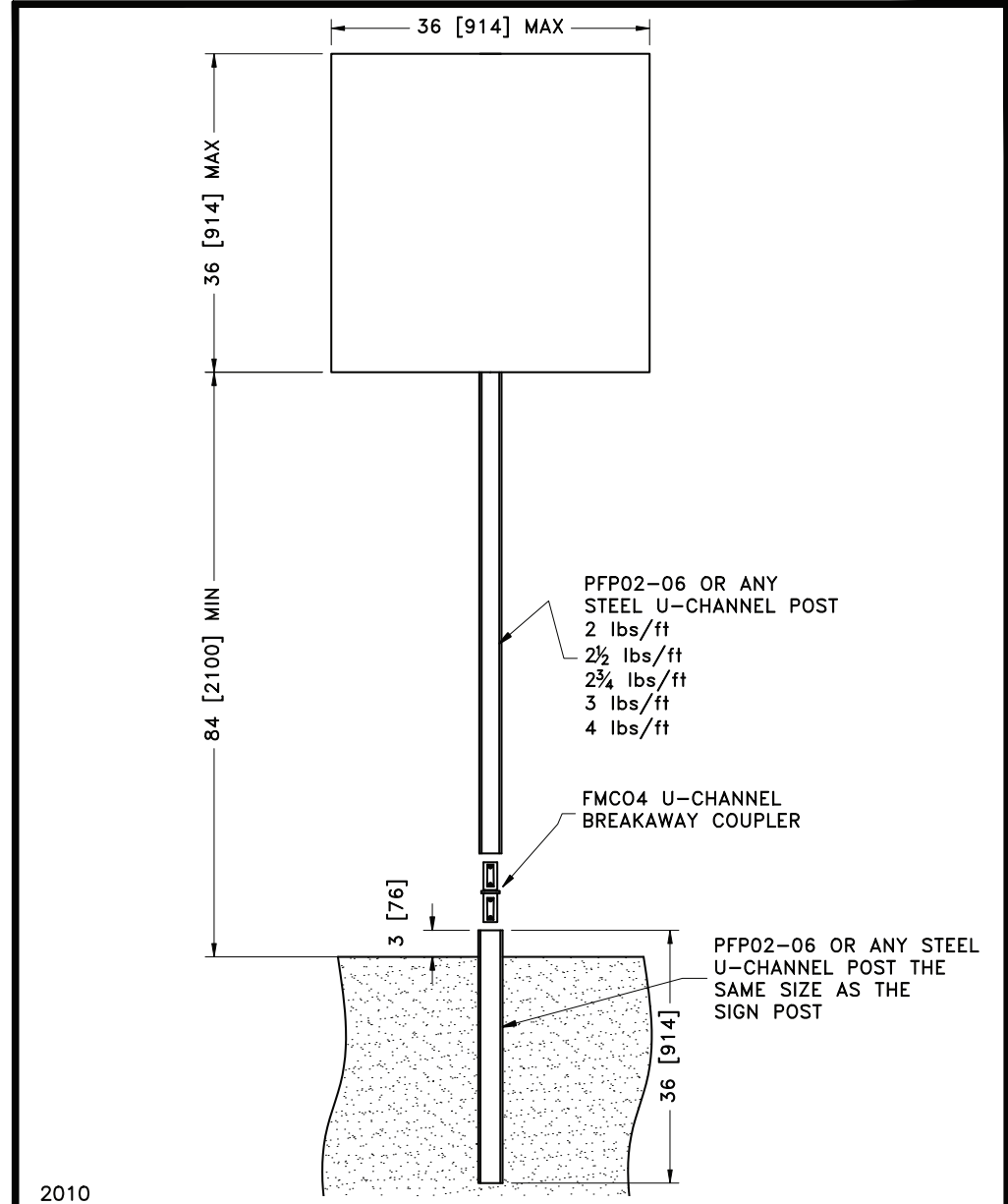
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20AUG2013	Task 2, Schematic Design, 60% CD's
07NOV2013	Task 3, Detail Design, 90% CD's
20NOV2013	Task 4, Construction Documentation, 100% CD's

PAGE TITLE / ELEMENT TYPE  
**Sign Type 102  
U-Channel Pole**

SHEET NUMBER  
**G31.0**



1 Model Vignettes  
Scale: NTS



2010

**SNAP'n SAFE U-CHANNEL SIGN POST  
GROUND MOUNT BREAKAWAY SYSTEM**

**DESIGNOVATIONS, INC.**  
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SSC14a

SHEET NO.	REF. NO.
1 of 1	DV-43

**SYSTEM SPECIFICATIONS**

**SPECIFICATIONS**

The SNAP'n SAFE U-Channel Sign Post Ground Mount Breakaway System meets the requirements for the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals. The ground mount SNAP'n SAFE breakaway coupler is used in conjunction with a ground anchor post. Simply insert the SNAP'n SAFE coupler into the anchor post and secure with two bolts and nuts. Next, slide the sign post on top of the coupler and secure with two bolts and nuts. At vehicle impact, the sign post breaks away and does not strike the vehicle's windshield or roof. Thus there is little risk of occupant injury. In addition, the anchor post is not damaged and can be reused.

Dimensional tolerances not shown or implied are intended to be those consistent with the proper functioning of the part, including its appearance and accepted manufacturing practices.

**COMPONENTS**

The SNAP'n SAFE U-Channel sign post system consists of a PFP02-06 or any 2 lb/ft [3 kg/m], 2 1/2" lb/ft [3.7 kg/m], 3 lb/ft [4.5 kg/m], or 4 lb/ft [6 kg/m] steel u-channel post, any anchor post 2 lb/ft [3 kg/m] x 48" [1219mm], 2 1/2" lb/ft [3.7 kg/m] x 48" [1219mm], 3 lb/ft [4.5 kg/m] x 48" [1219mm], or 4 lb/ft [6 kg/m] x 48" [1219mm], a sign panel and attachment hardware, one FMC04 coupler, four 1 1/2" [9.5 mm] long FBX10a bolts with nuts and four FBX10 galvanized washers.

**ACCEPTANCE**

George E. Rice, Jr., Letter to Jim Anderson, Geometric and Roadside Design Acceptance Letter HSSD/SS-156, Federal Highway Administration, Washington, D.C., December 6, 2007.

**CONTACT INFORMATION**

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**SNAP'n SAFE U-channel Sign Post Ground Mount Breakaway System**

SSC14a

SHEET NO.	DATE
1 of 1	09-28-10



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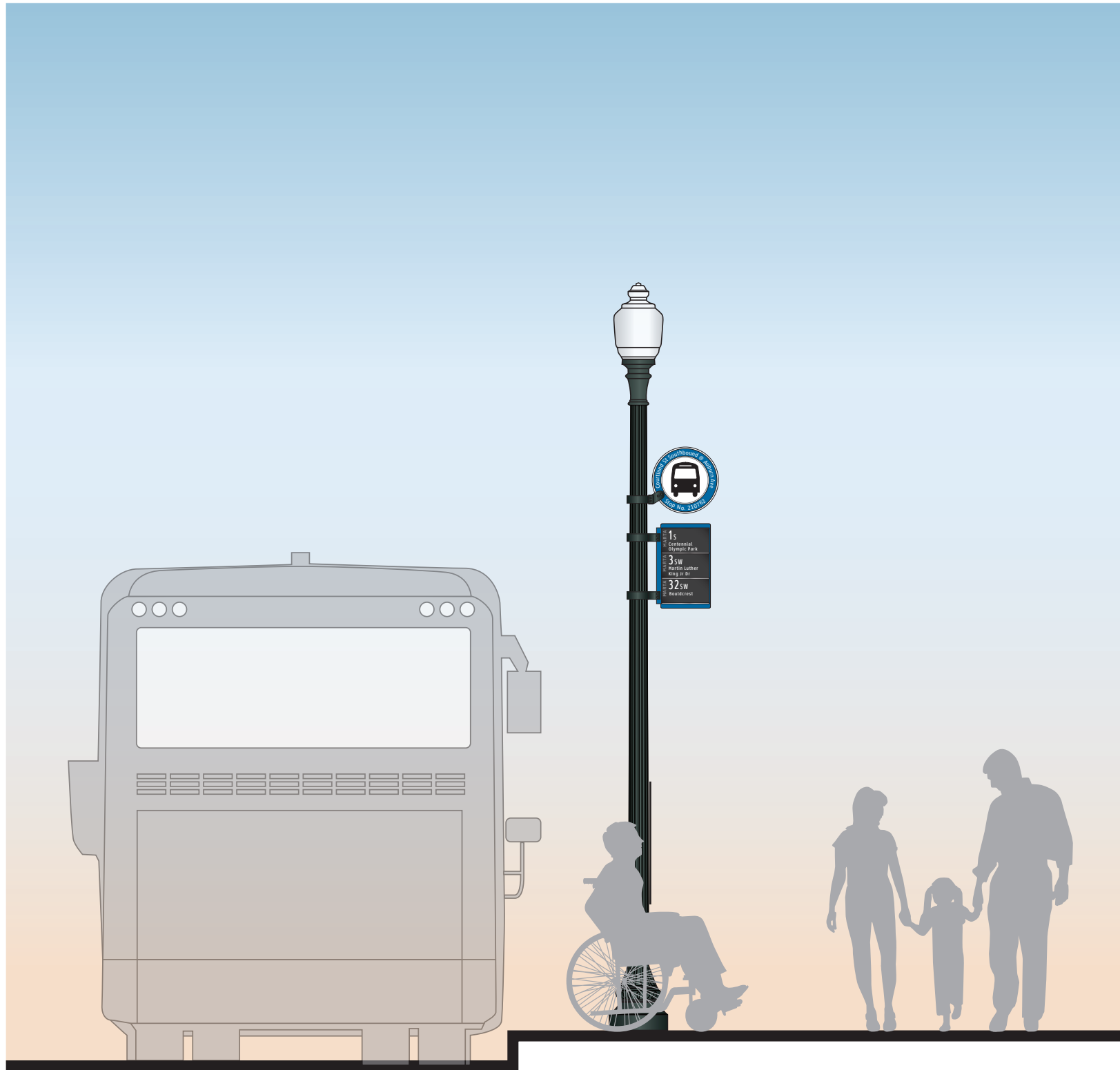
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PROJECT NAME/PROJECT CODE  
**Atlanta Regional Commission  
Unified Bus Stop Signage**  
13ARC001

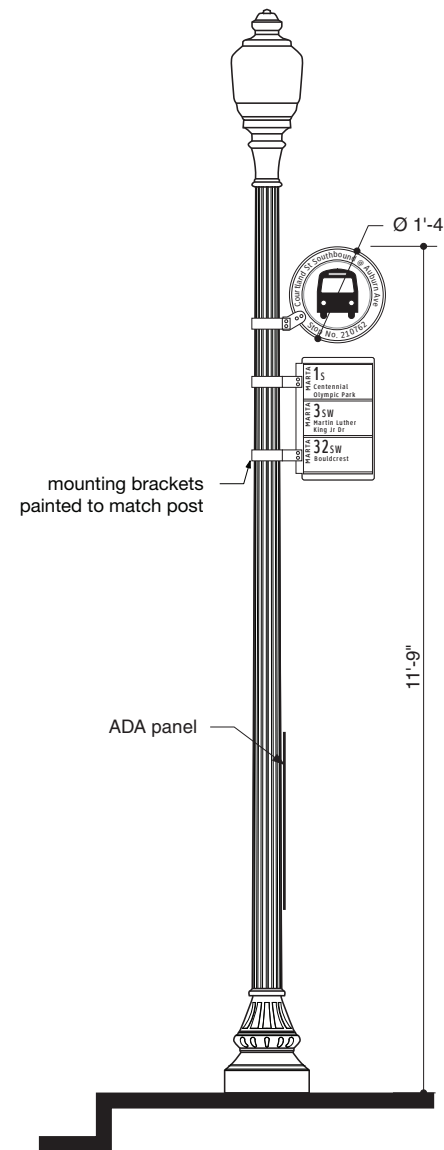
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20AUG2013 Task 2, Schematic Design, 60% CD's  
07NOV2013 Task 3, Detail Design, 90% CD's  
20NOV2013 Task 4, Construction Documentation, 100% CD's

PAGE TITLE / ELEMENT TYPE  
**Sign Type 102  
U-Channel Pole Cut Sheets**

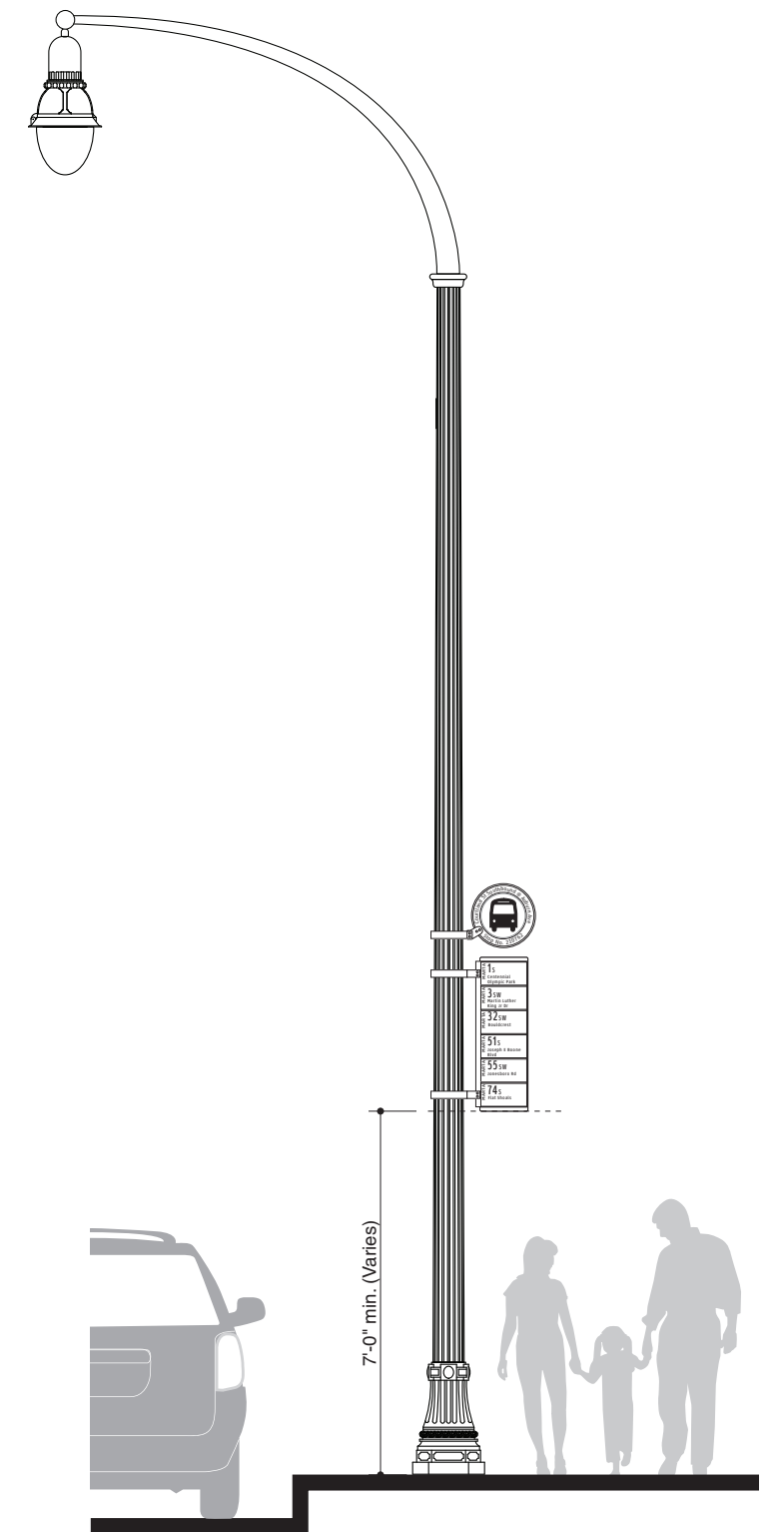
SHEET NUMBER  
**G33.0**



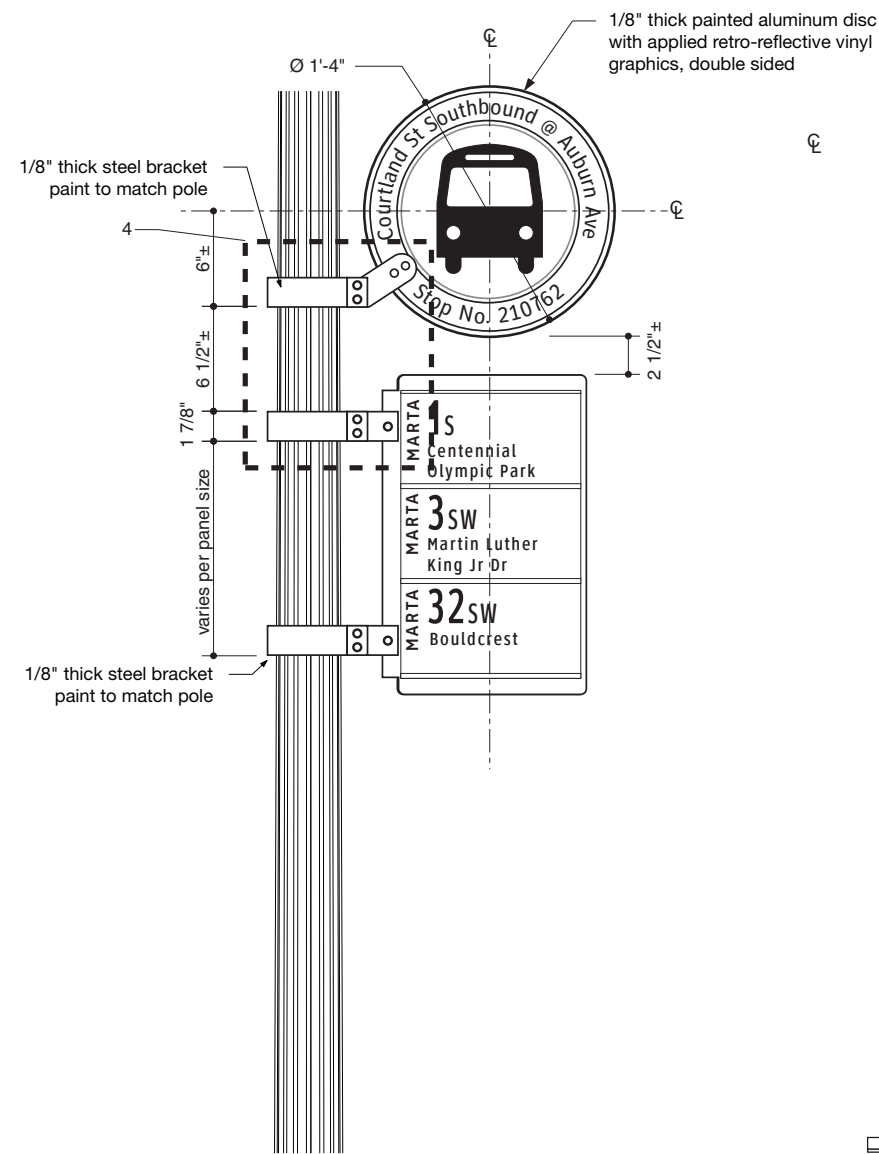
**1** Front Elevation  
Scale: 3/8"=1'-0"



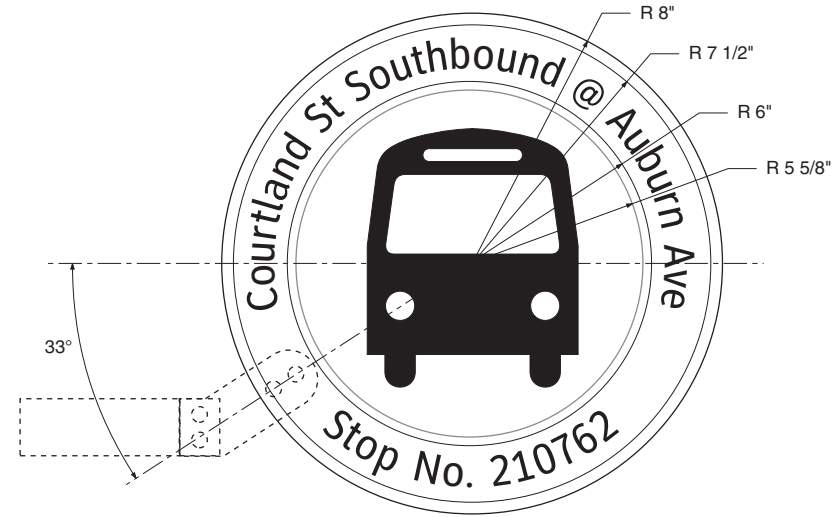
**2** Front Elevation  
Scale: 3/8"=1'-0"



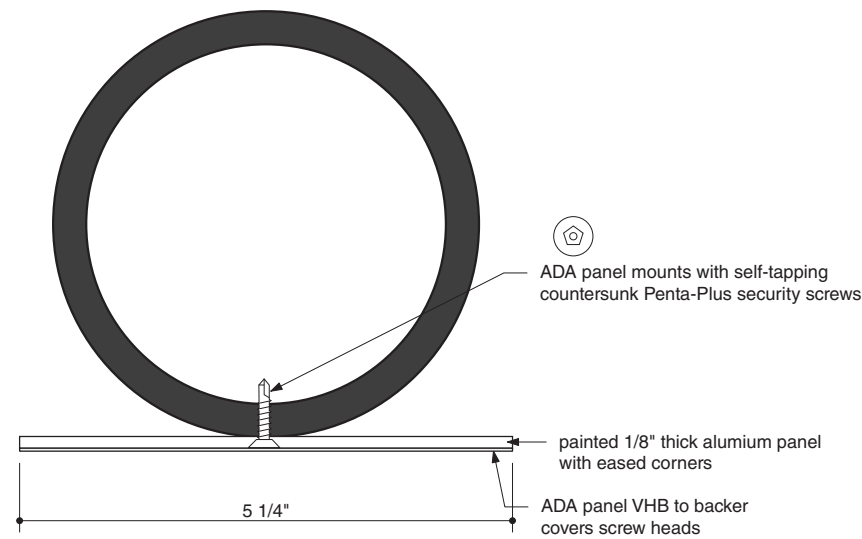
**3** Front Elevation: Similar  
Scale: 1/4"=1'-0"



**1** Detail Elevation  
Scale: 1"=1'-0"

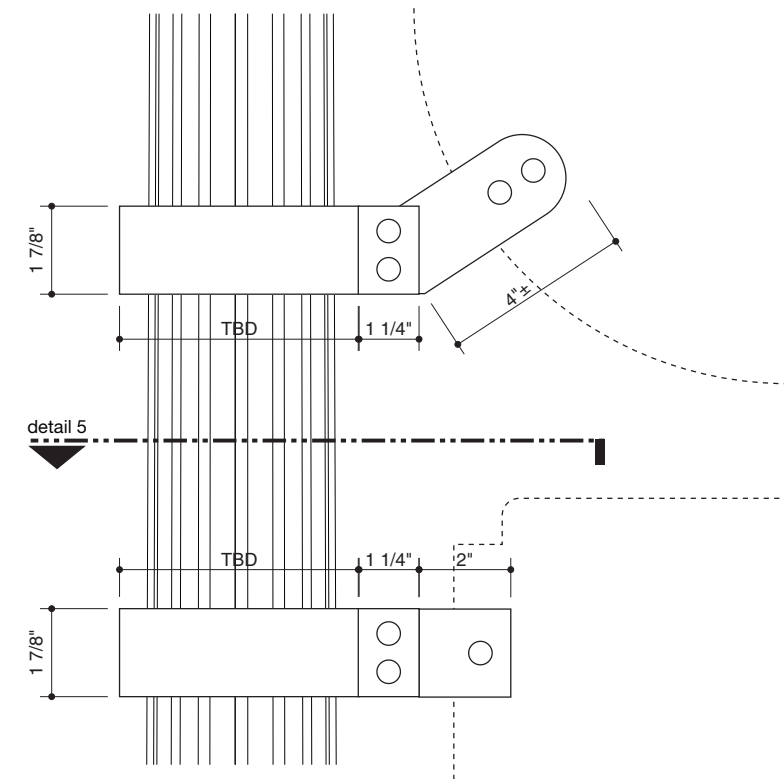


**2** Disc Layout Detail  
Scale: 1:6

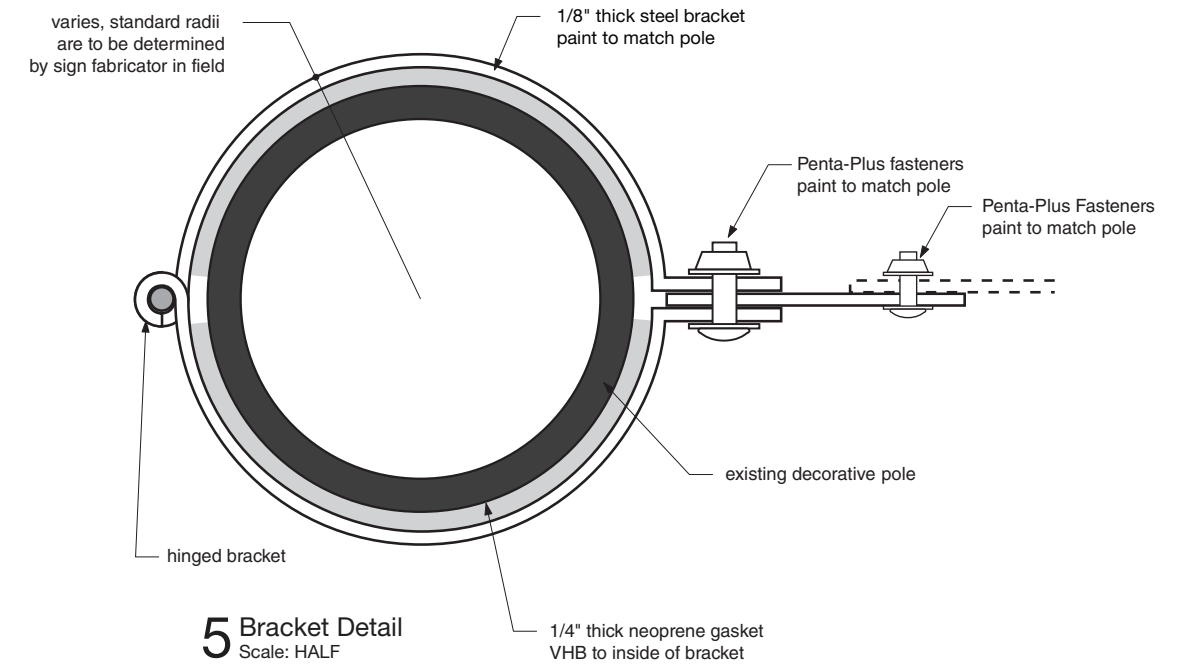


NOTE: See ST101 for ADA panel details

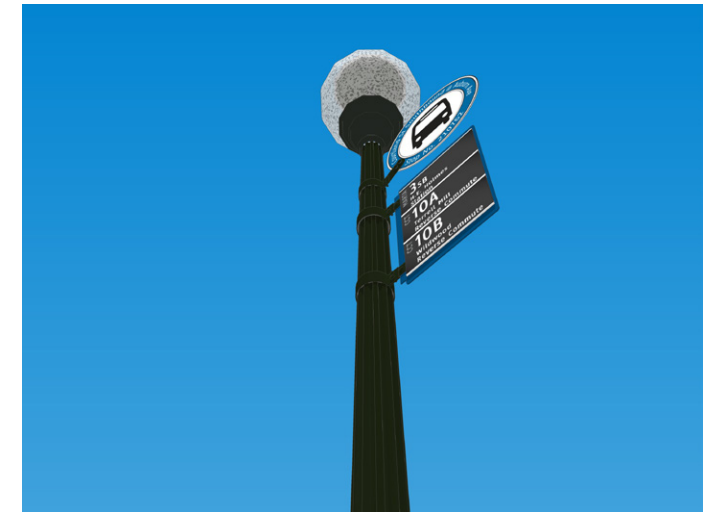
**3** ADA Panel Mounting Detail  
Scale: HALF



**4** Bracket Detail  
Scale: 3"=1'-0"



**5** Bracket Detail  
Scale: HALF



1 Model Vignette  
Scale: NTS



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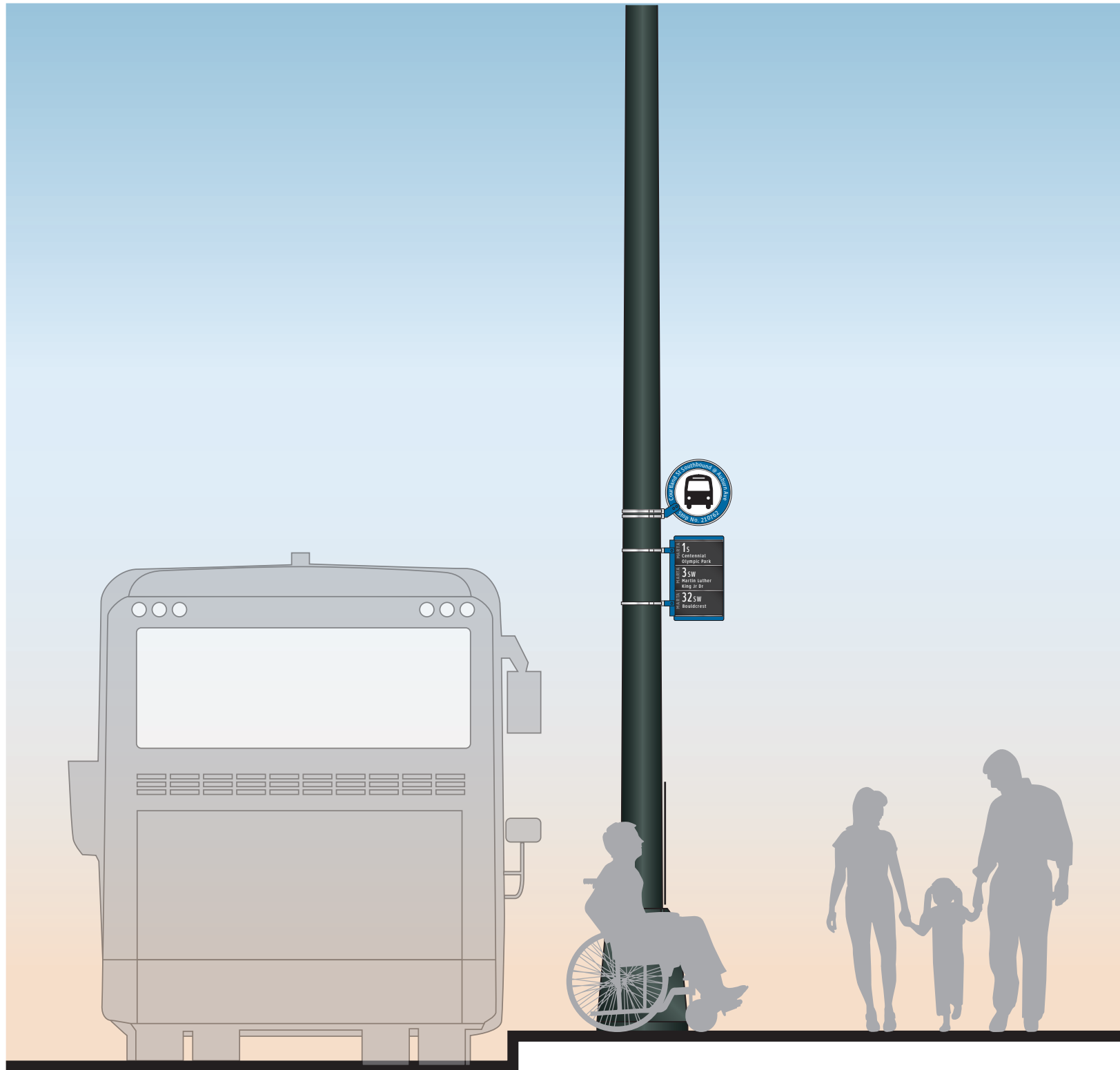
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**Atlanta Regional Commission  
Unified Bus Stop Signage**  
13ARC001

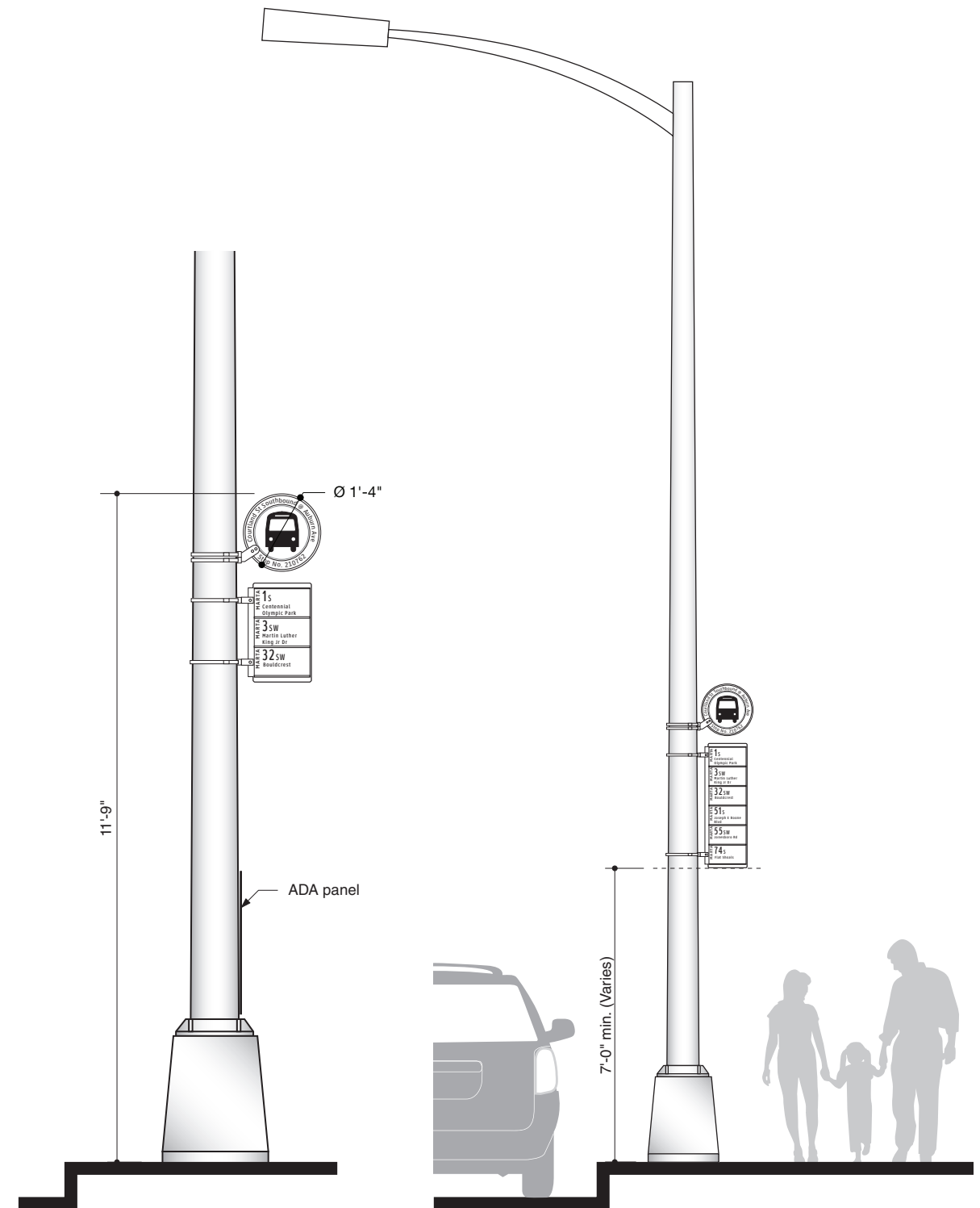
ISSUES/REVISIONS  
28JUN2013 Task 1, Concept Development, 30% CD's  
20AUG2013 Task 2, Schematic Design, 60% CD's  
07NOV2013 Task 3, Detail Design, 90% CD's  
20NOV2013 Task 4, Construction Documentation, 100% CD's

PAGE TITLE / ELEMENT TYPE  
**Sign Type 103A**  
Existing Decorative Pole

SHEET NUMBER  
**G36.0**



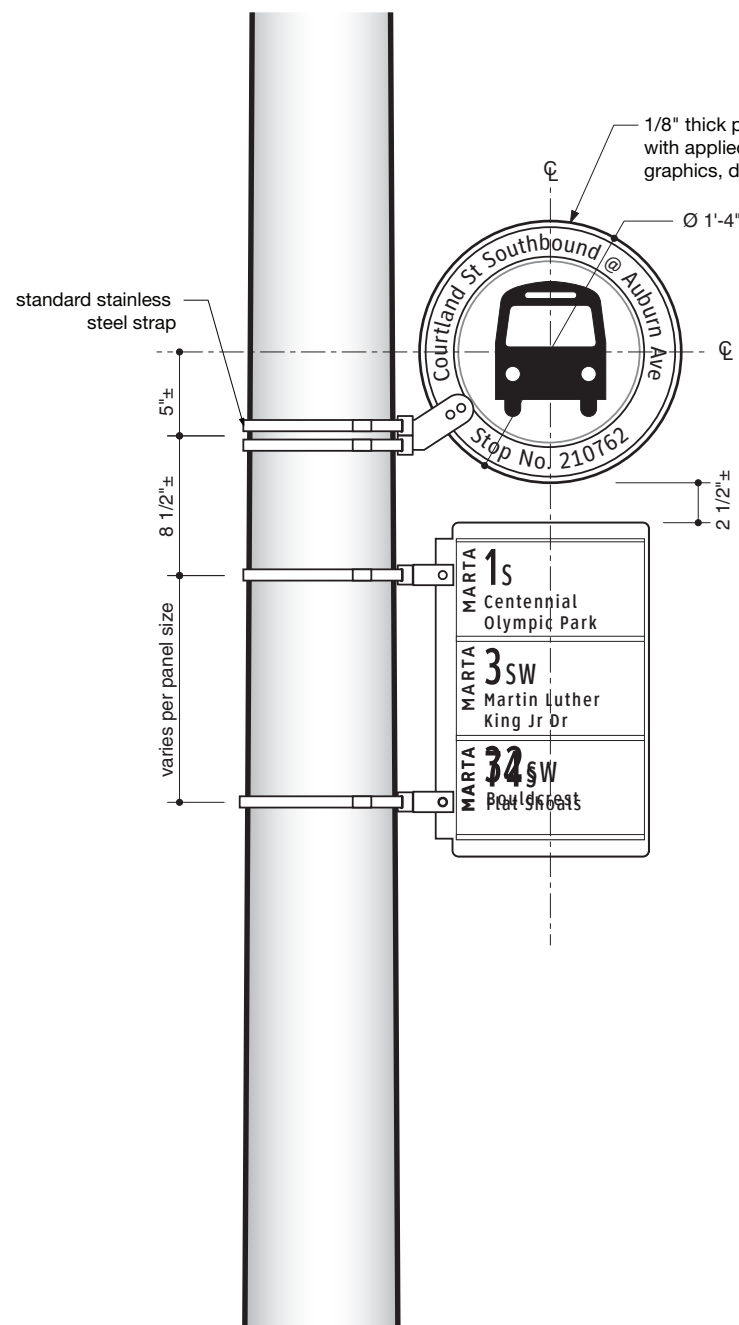
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Scale: 3/8"=1'-0"



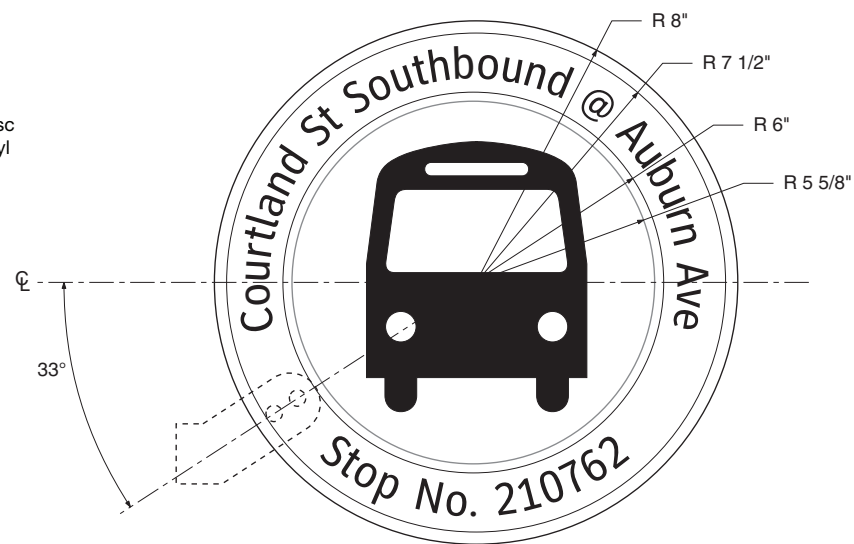
**2** Front Elevation  
Scale: 3/8"=1'-0"

**3** Front Elevation: Similar  
Scale: 1/4"=1'-0"

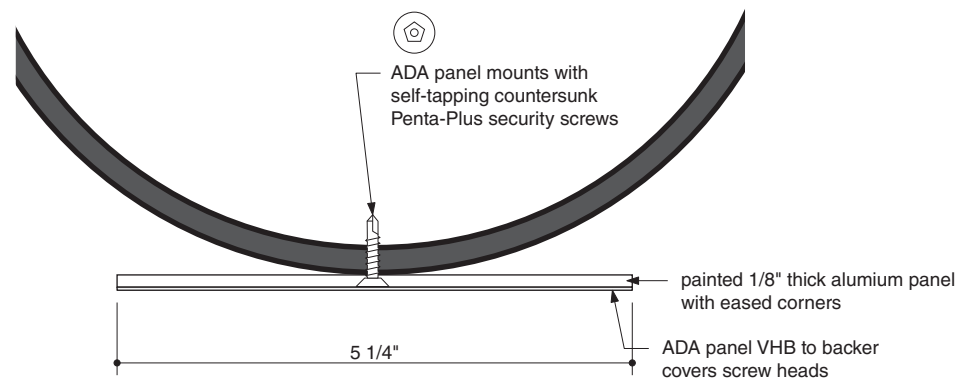




1 Elevation Detail  
Scale: 1"=1'-0"

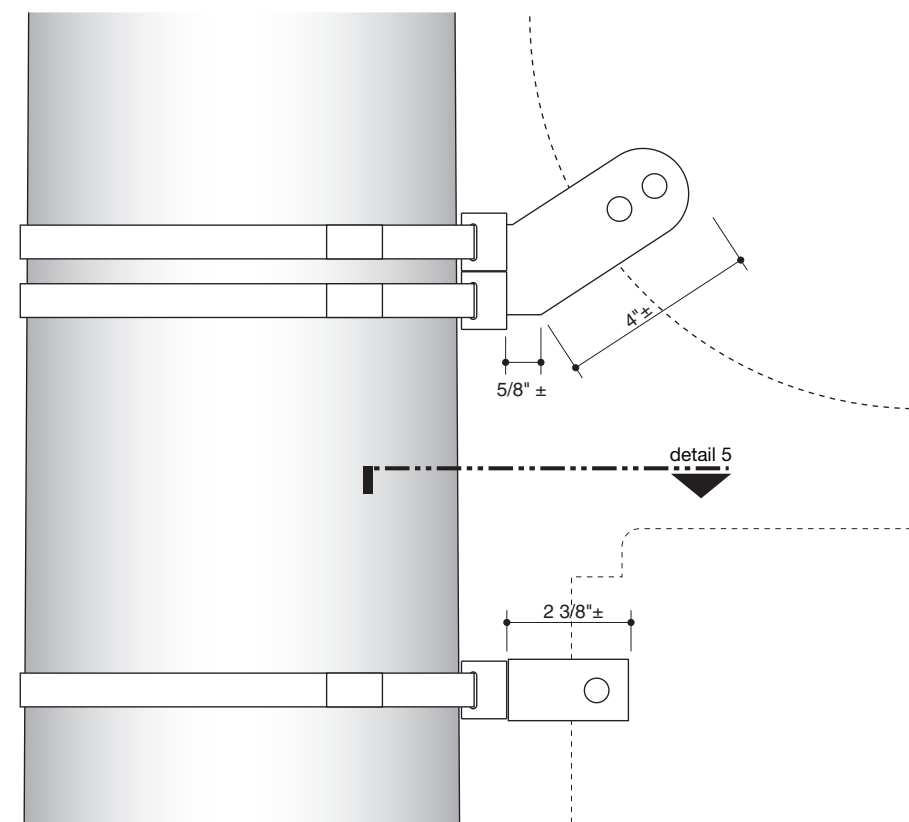


2 Disc Layout Detail: Option 1  
Scale: 1:6

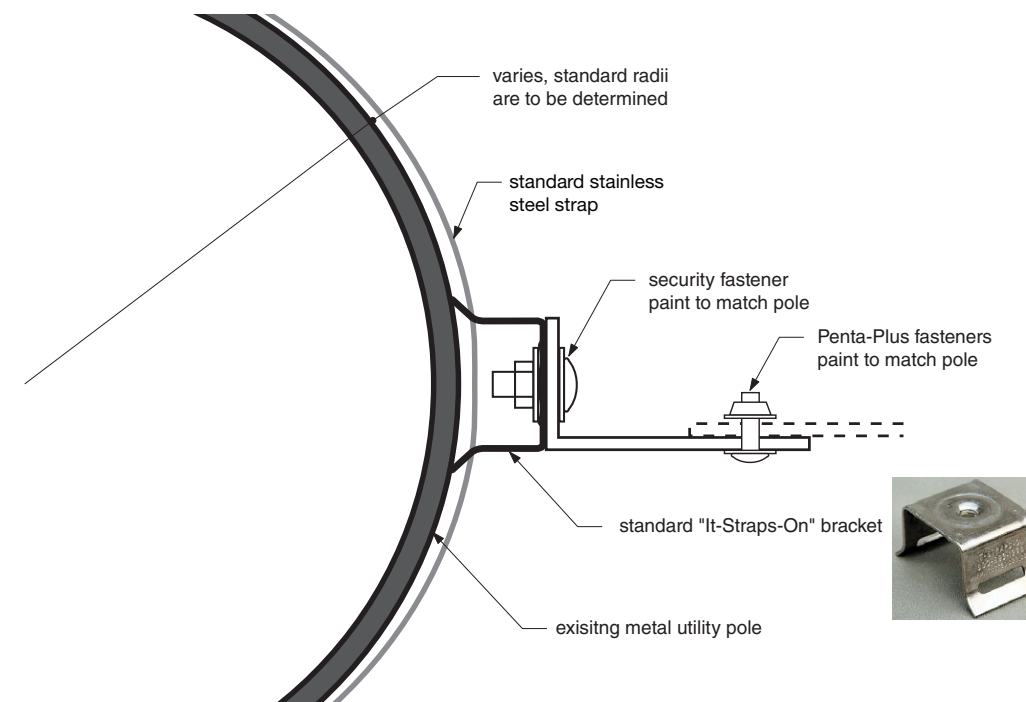


NOTE: See ST101 for ADA panel details

3 ADA Panel Mounting Detail  
Scale: HALF



4 Bracket Detail  
Scale: 3"=1'-0"



5 Bracket Detail  
Scale: HALF

---

# Appendix A



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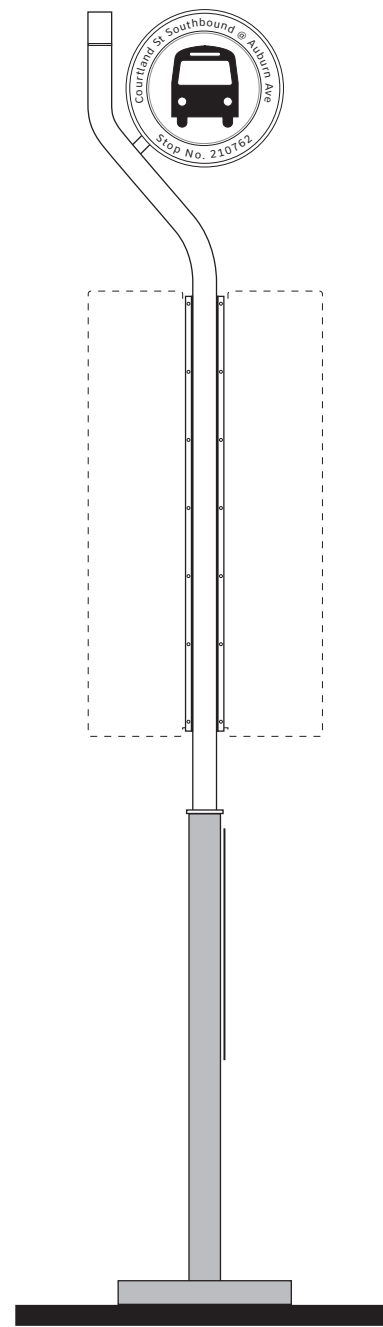
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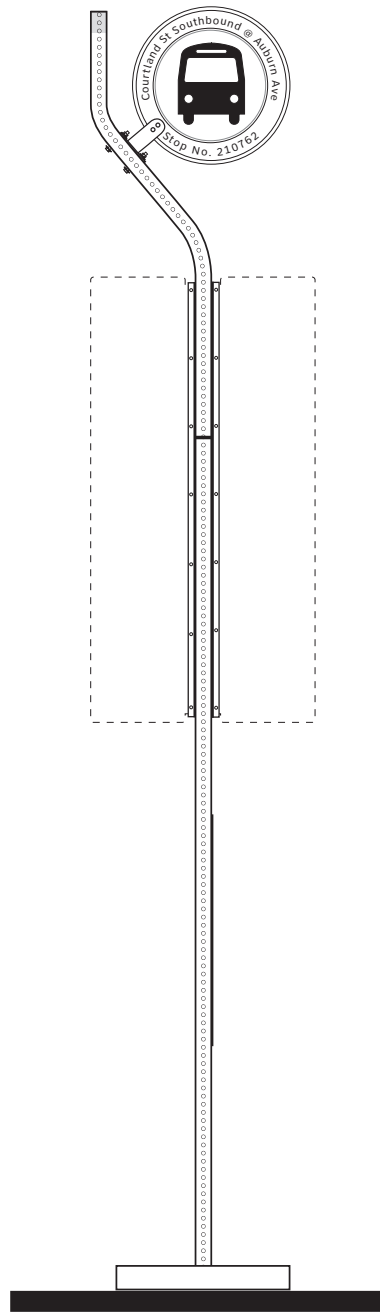
**Atlanta Regional Commission  
Unified Bus Stop Signage**  
13ARC001

**ISSUES/REVISIONS**

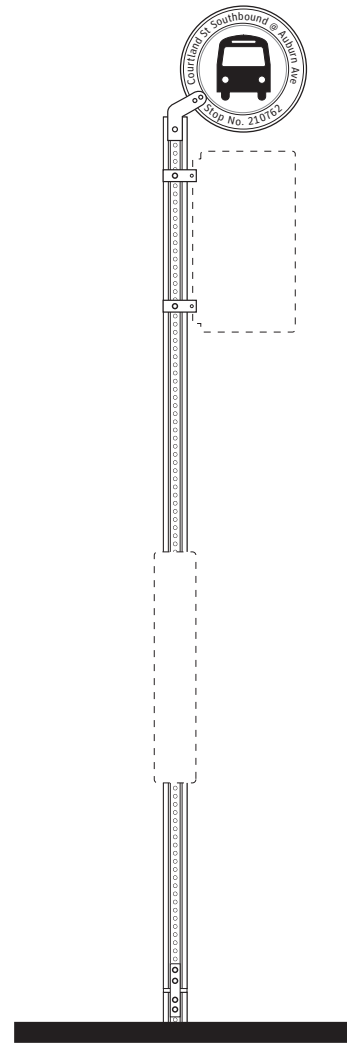
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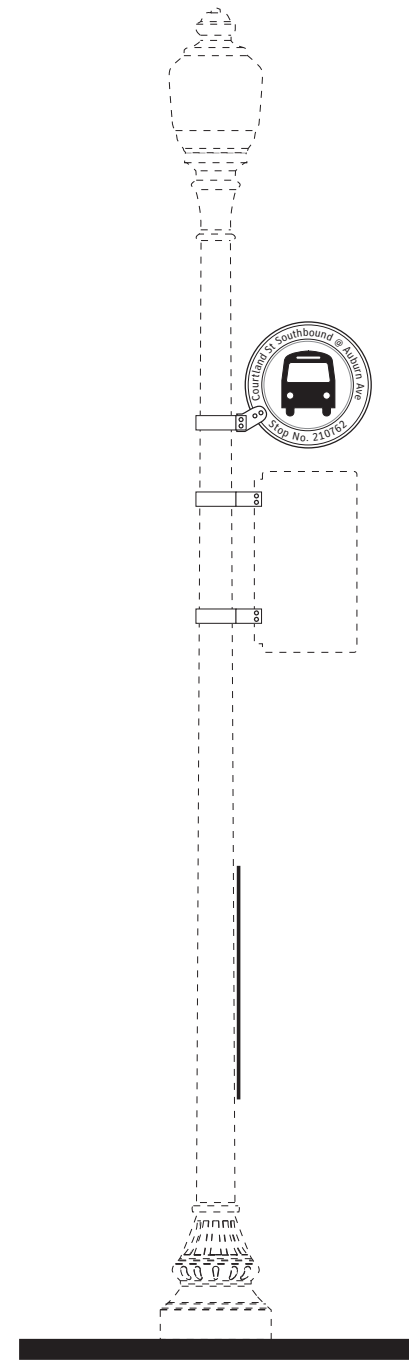
Sign Type 100  
Custom Pole & Illuminated Disc  
**\$2,600 to \$6,000**



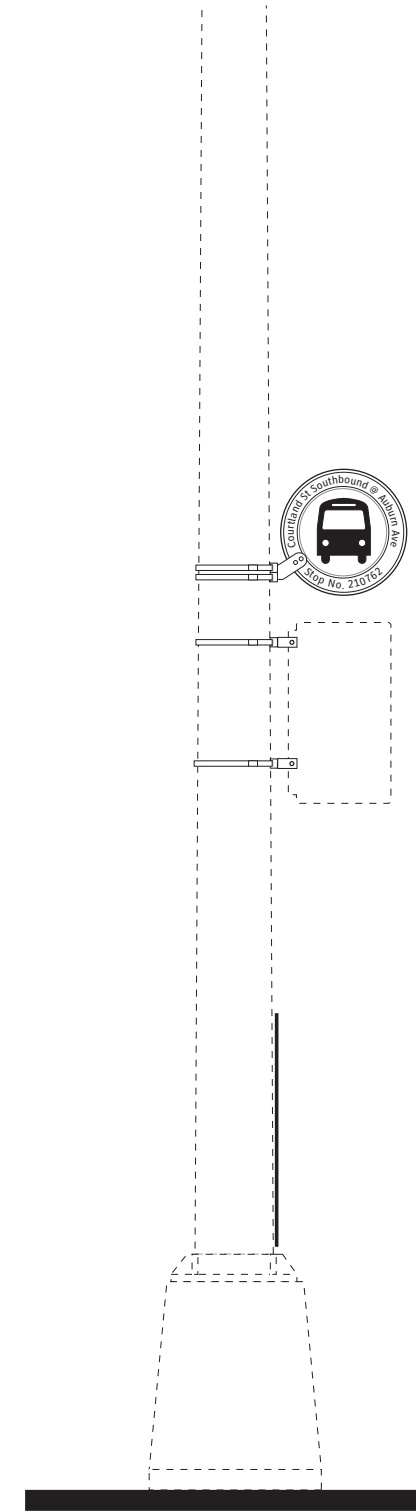
Sign Type 101  
Perforated Square Pole & Disc  
**\$450 to \$1000**



Sign Type 102  
U-Channel Pole & Disc  
**\$200 to \$400 (with new post)**  
**\$90 to \$301 (existing post)**



Sign Type 103A  
Disc & Mounting Hardware  
**\$375 to \$458**



Sign Type 103B  
Disc & Mounting Hardware  
**\$100 to \$458**

NOTE: Pricing assumes standard j-bolt or spread anchor hardware (i.e. does not include breakaway hardware).



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13ARC001

ISSUES/REVISIONS  
28JUN2013 Task 1, Concept Development, 30% CD's  
20AUG2013 Task 2, Schematic Design, 60% CD's  
07NOV2013 Task 3, Detail Design, 90% CD's  
20NOV2013 Task 4, Construction Documentation, 100% CD's

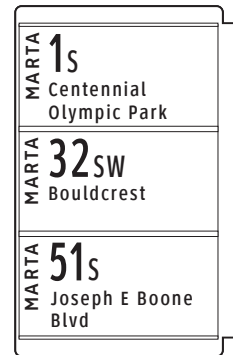
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**Appendix A**  
**Poles and Mounting Hardware**  
**Pricing**

SHEET NUMBER  
**A1.0**

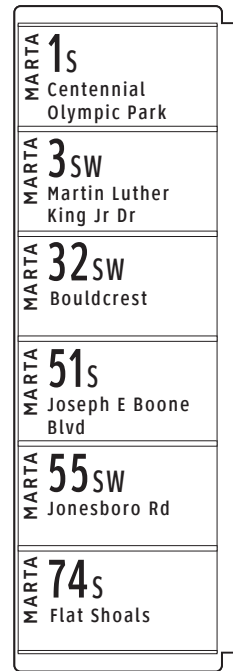
Single  
\$60 to \$195



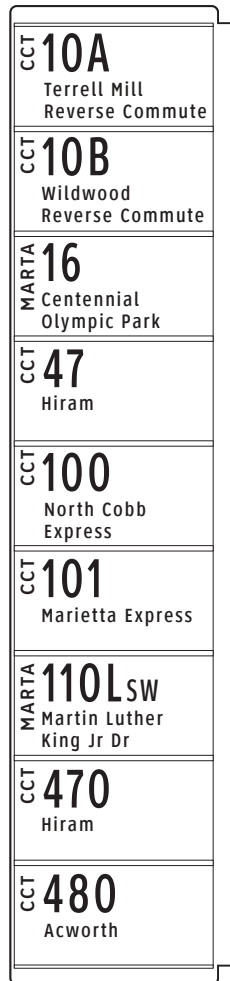
Small  
\$168 to \$344



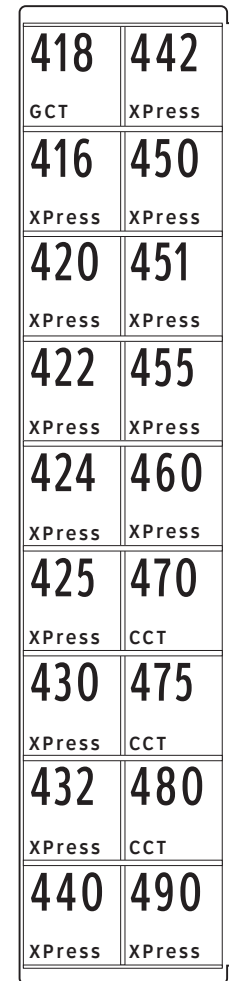
Medium  
\$330 to \$687



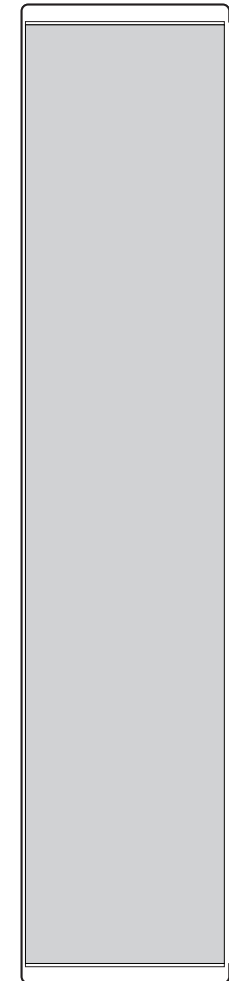
Large  
\$465 to \$966



Large-Plus  
\$465 to \$966



Banner  
\$370 to \$477



ADA Panel



\$110 to \$142  
default stop  
identification panel

\$92 to \$122/each  
individual panels  
as needed per stop

NOTE: All panels are double sided.

### All Sign Location (Excluding Arts Center Station)

Sign Type	Quantity	Price	Sub-Total
ST100 + One Small Panel	18	\$2,944 to \$6,168	\$52,992 to \$111,024
ST100 + One Medium Panel	12	\$3,287 to \$6,330	\$39,444 to \$75,960
ST100 + One Large Panel	25	\$3,566 to \$6,465	\$89,150 to \$161,625
ST100 + One Large-Plus Panel	8	\$3,566 to \$6,465	\$28,528 to \$51,720
ST103A + One Small Panel	2	\$543 to \$802	\$1,086 to \$1,604
ST103B + One Small Panel	1	\$268 to \$802	\$268 to \$802
			<b>\$211,468 to \$402,735</b>
		ADA Panels	\$26,000 to \$34,000
			<b>\$237,468 to \$436,735</b>

### Arts Center Station Option 1: ST100

Sign Type	Quantity	Price	Sub-Total
ST100 + One Small Panel	10	\$2,944 to \$6,168	\$29,440 to \$61,680
		ADA Panels	\$3,800 to \$5,000
			<b>\$33,240 to \$66,680</b>

### Arts Center Station Option 2: ST102

Sign Type	Quantity	Price	Sub-Total
ST102 + One Small Panel	10	\$368 to \$744	\$3,680 to \$7,440
		ADA Panels	\$3,800 to \$5,000
			<b>\$7,480 to \$12,440</b>

### All Sign Location + Arts Center Option 1: \$270,888 to \$503,415

### All Sign Location + Arts Center Option 2: \$244,948 to \$449,175

NOTE: These prices do NOT include:

- 1) Banner panels.
- 2) Cost of installation.
- 3) Cost of running electrical to each ST100 location.
- 4) Cost of foundations/footers if required.
- 5) Cost of breakaway hardware:
  - ST100 ~ \$356/each
  - ST101 ~ \$55/each
  - ST102 ~ \$50/each
- 6) Cost of prototyping or mock-ups.
- 7) Contract particulars (Bonds, Insurance, etc.).
- 8) Cost of any city mandated ordinance compliance which was not anticipated.

\* Pricing shown is preliminary only. Actual final pricing will be determined through the bidding process.



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**PROJECT NAME/PROJECT CODE**  
**Atlanta Regional Commission**  
**Unified Bus Stop Signage**  
 13ARC001

**ISSUES/REVISIONS**  
 28JUN2013 Task 1, Concept Development, 30% CD's  
 20AUG2013 Task 2, Schematic Design, 60% CD's  
 07NOV2013 Task 3, Detail Design, 90% CD's  
 20NOV2013 Task 4, Construction Documentation, 100% CD's

**PAGE TITLE / ELEMENT TYPE**  
**Appendix A**  
**Pricing Summary**

**SHEET NUMBER**  
**A3.0**

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# Appendix A Alternate



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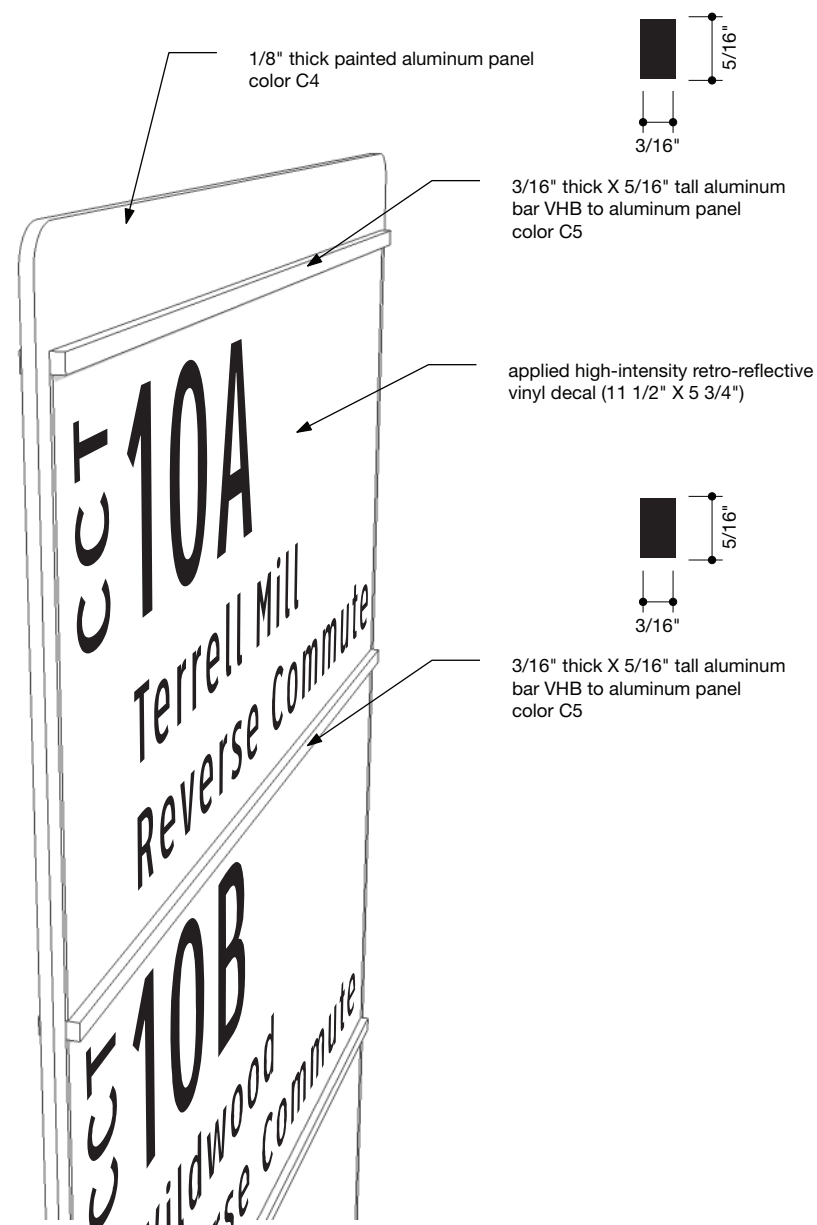
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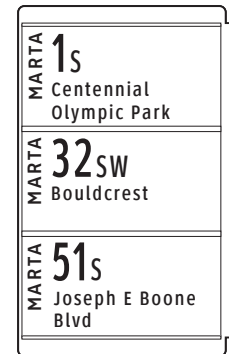
Single

\$50 to \$150



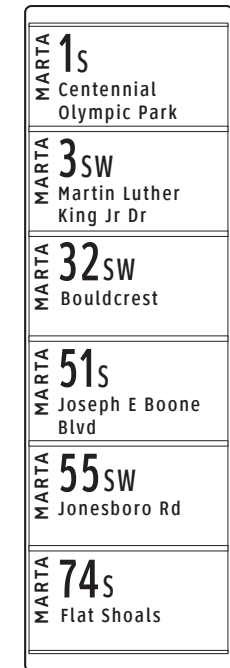
Small

\$120 to \$280



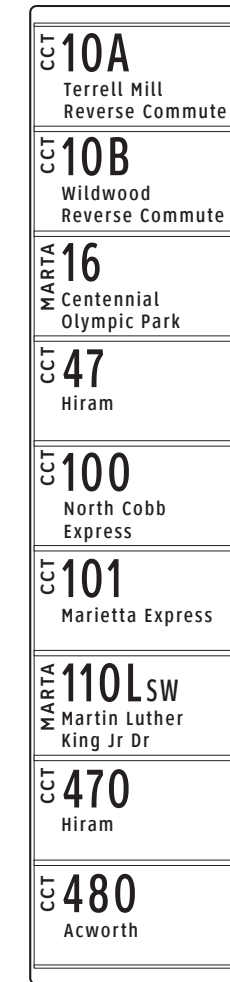
Medium

\$240 to \$354



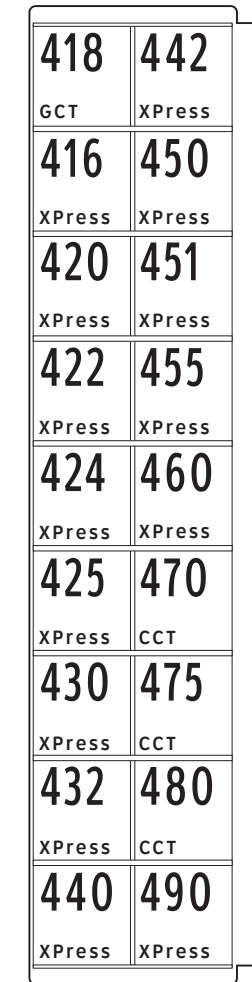
Large

\$360 to \$400



Large-Plus

\$360 to \$400



NOTE: All panels are double sided.

1 Route Panel Decal Alternate  
Scale: NTS

2 Route Panel Pricing  
Scale: NTS



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20NOV2013 Task 4, Construction Documentation, 100% CD's

PAGE TITLE / ELEMENT TYPE  
**Appendix A Alternate  
Information Panel Pricing**

SHEET NUMBER  
**A4.0**

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# Appendix B



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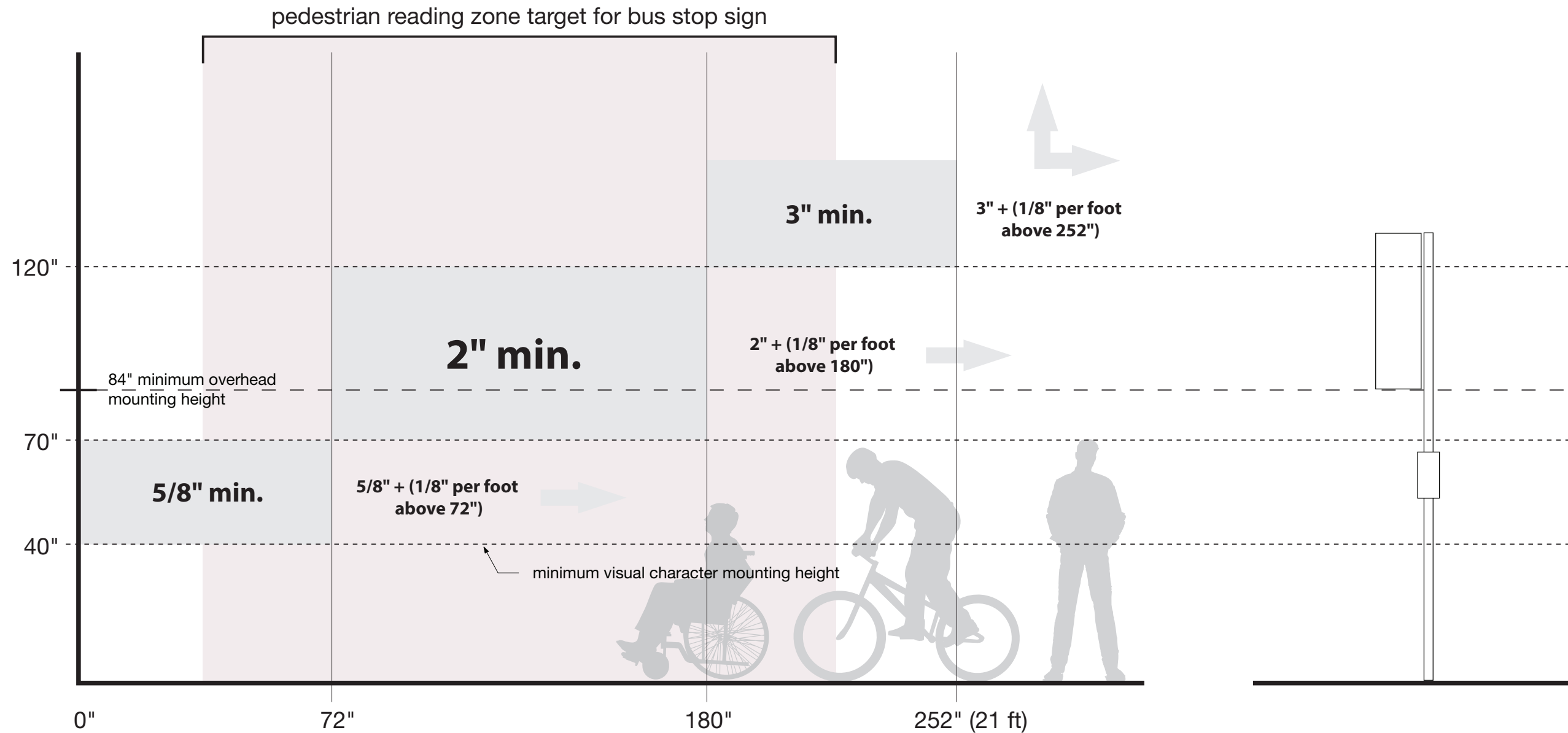
**PROJECT NAME/PROJECT CODE**

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Unified Bus Stop Signage**  
13ARC001

**ISSUES/REVISIONS**

28JUN2013 Task 1, Concept Development, 30% CD's  
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07NOV2013 Task 3, Detail Design, 90% CD's  
20NOV2013 Task 4, Construction Documentation, 100% CD's

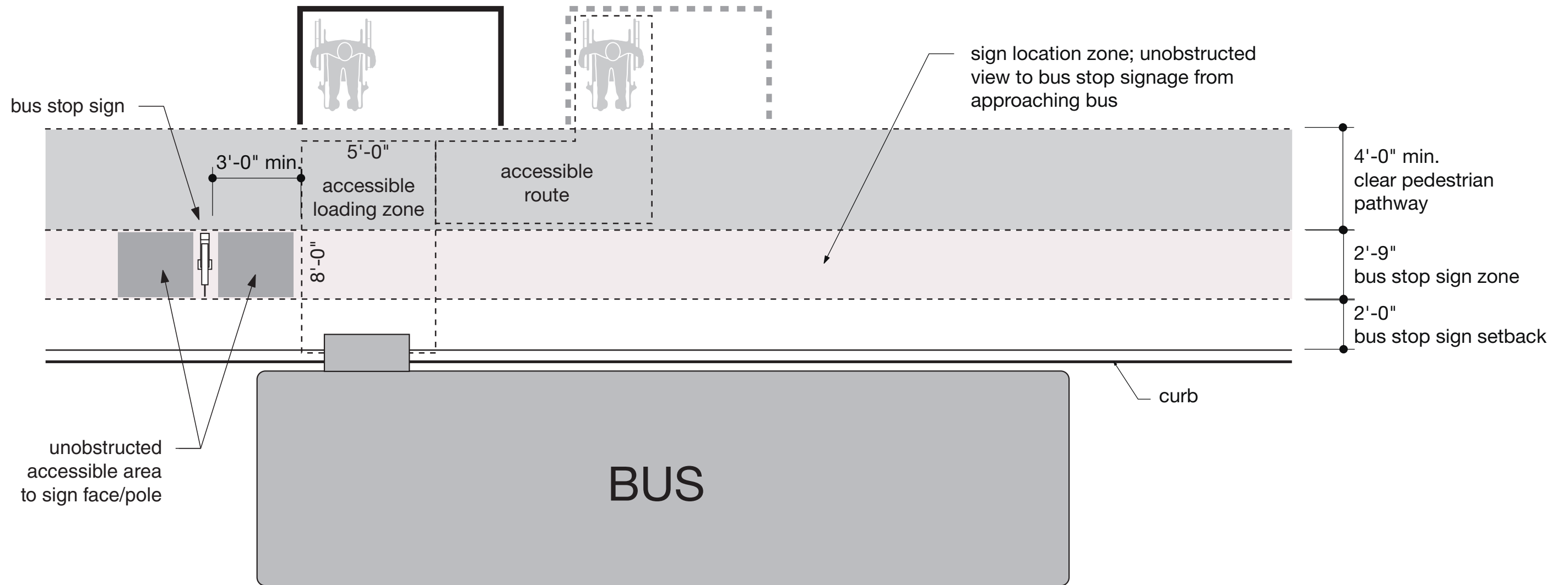




Horizontal Viewing Distance vs Distance to Baseline of Text above Floor/Ground vs Character Height

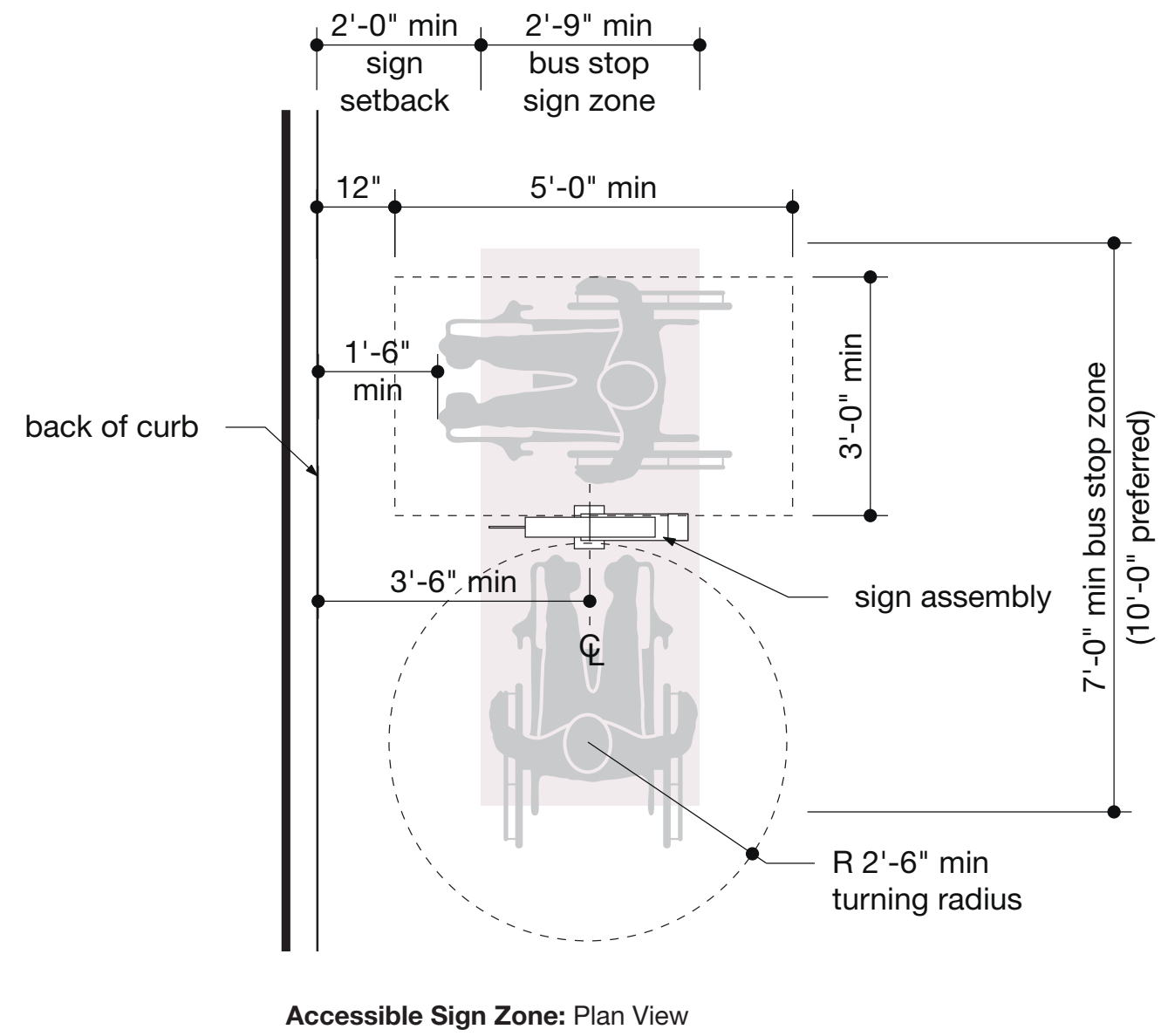
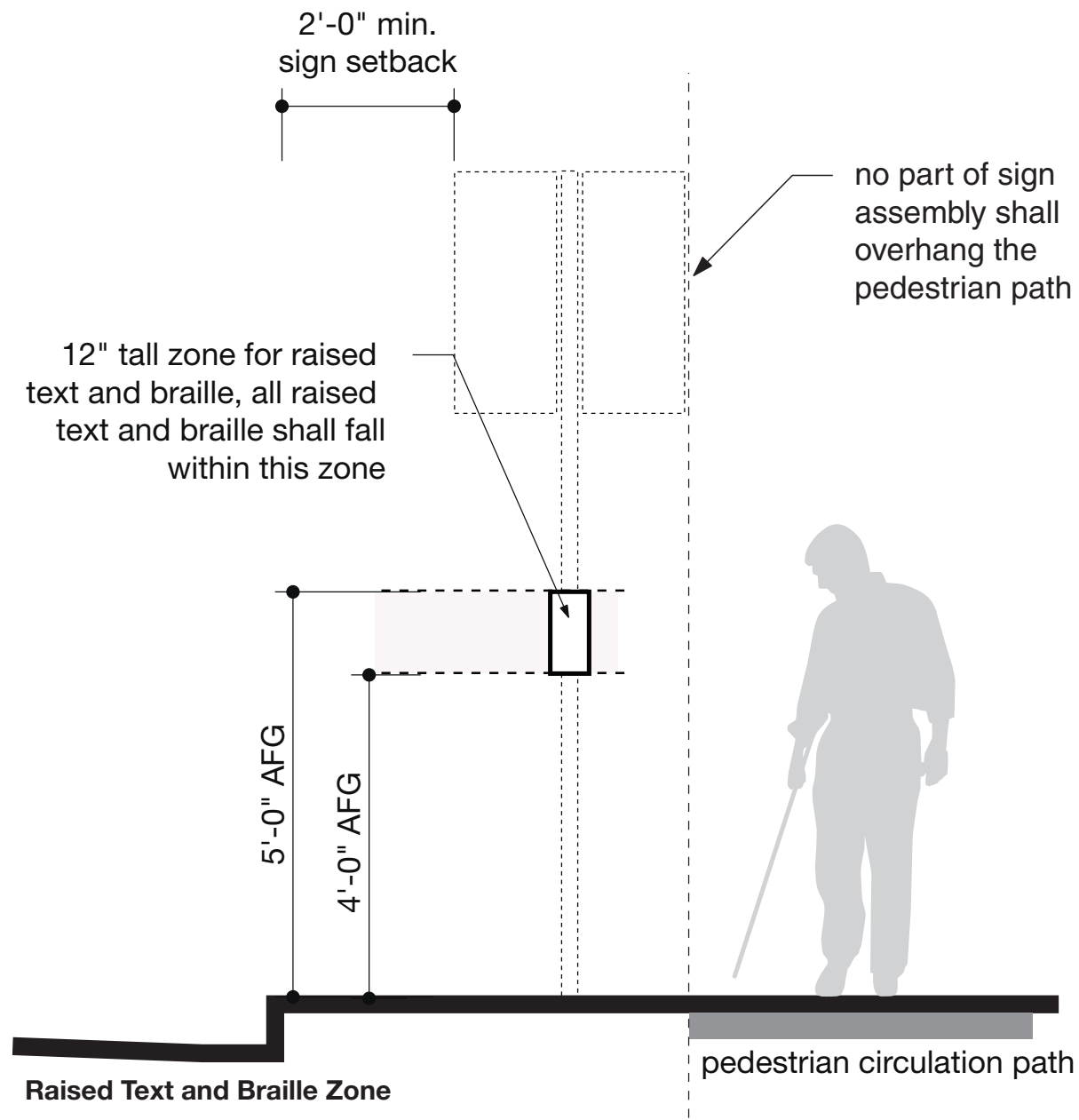
GENERAL NOTES

- 1) Text size and related distance information is referenced from the Department of Justice 2010 ADA Standards and proposed 2011 Pedestrian Facilities on the Public Rights-of-Way Guidelines.



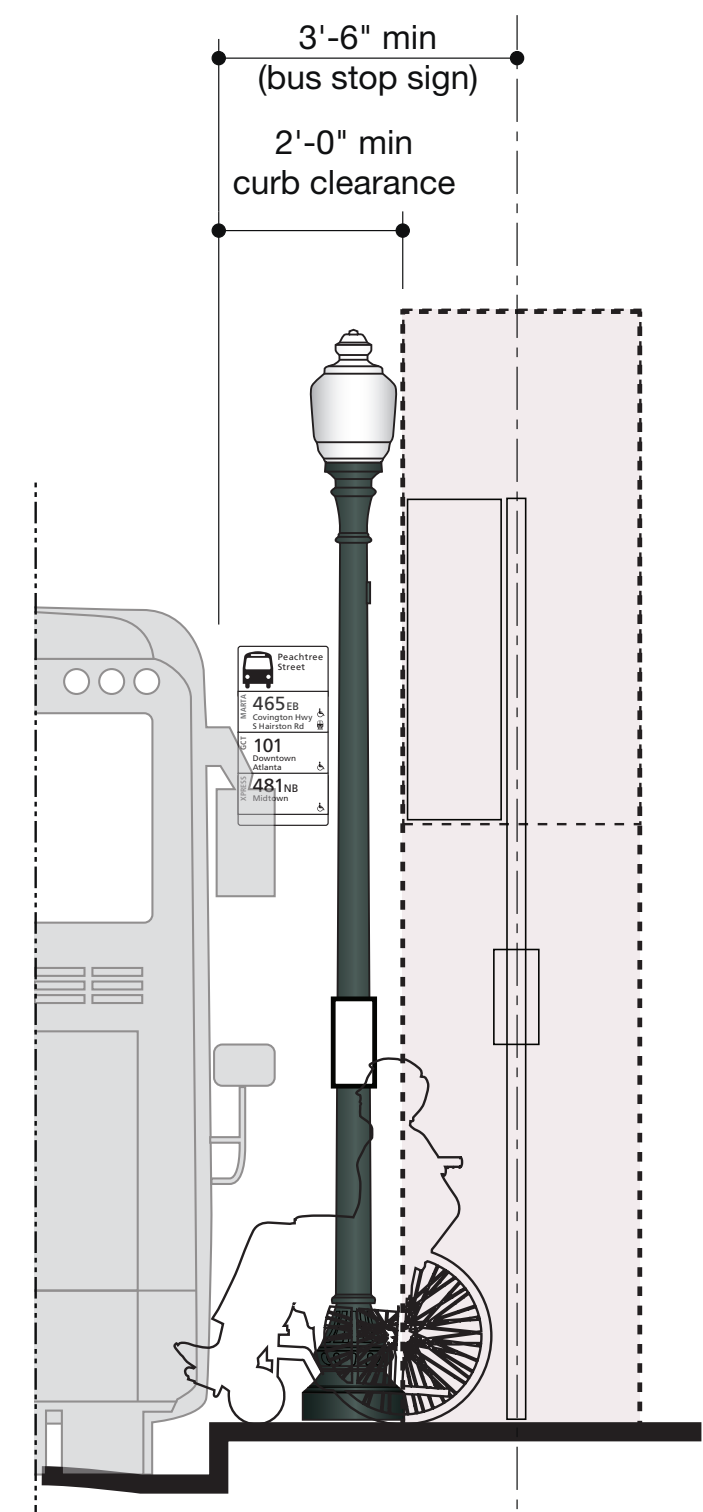
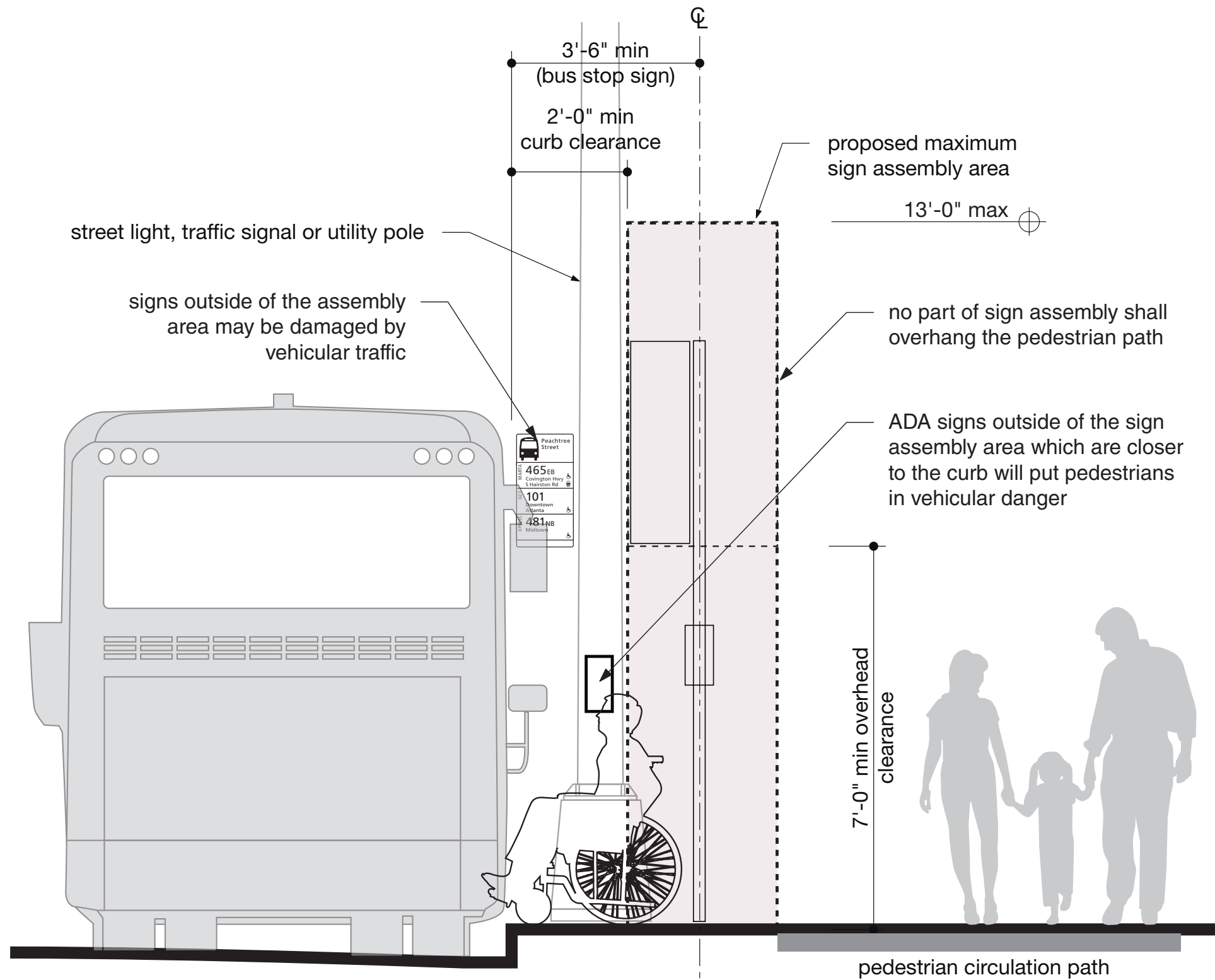
**GENERAL NOTES**

- 1) Accessible path, route and loading zone information is referenced from the Department of Justice 2010 ADA Standards and proposed 2011 Pedestrian Facilities on the Public Rights-of-Way Guidelines.
- 2) The "Bus Stop Zone" is a guideline proposed by fd2s, inc. to place the signage in an area that will be accessible and clear of the pedestrian pathway while maintaining accessibility/pedestrian safety in mind.
- 3) The "Sign Setback" is referenced from the MUTCD to provide minimum vehicular clearance.
- 4) The "unobstructed view to bus stop sign" language is from the Department of Justice Transportation Facilities guidelines.



**GENERAL NOTES**

- 1) ADA sign raised text and braille zone is referenced from the Department of Justice 2010 ADA Standards.
- 2) The "Accessible Sign Zone" is a guideline proposed by fd2s, inc. to place the signage in an area that will be accessible and clear of the pedestrian pathway while maintaining accessibility/pedestrian safety in mind.
- 3) The "Sign Setback" is referenced from the MUTCD to provide minimum vehicular clearance.a



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# Appendix C



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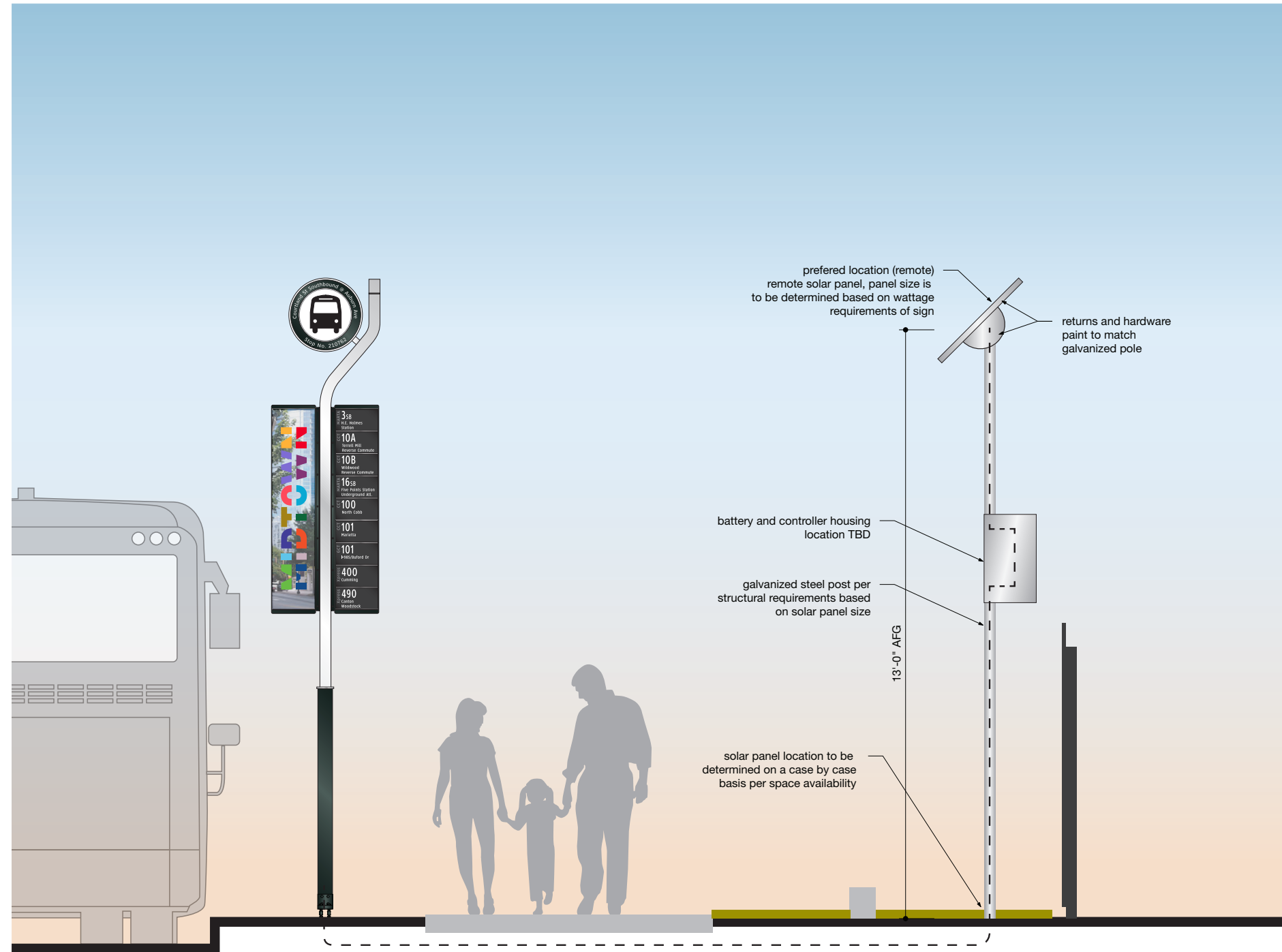
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20NOV2013 Task 4, Construction Documentation, 100% CD's



1 Elevation Study  
Scale: 3/8"=1'-0"

Jan	Feb	Mar	Apr	May	Jun
40°	48°	56°	64°	72°	80°
July	Aug	Sep	Oct	Nov	Dec
72°	64°	56°	48°	40°	32°

Solar Panel Optimum Angles for a panel facing due south at solar noon in Atlanta, Georgia.

3 Photovoltaic Panel Angles by Month  
Scale: NTS

Winter	Spring/Fall	Summer
32°	56°	80°

Solar Panel Optimum Angles for a panel facing due south at solar noon in Atlanta, Georgia.

4 Photovoltaic Panel Angles by Season  
Scale: NTS

- Symbol Disc Power Usage: 9.6 Amps per 10 hour night
- Solar Panel Wattage: One 68W/16.5V panels
- Solar Panel Size: L 31", W 26", D 1.5" (36 lbs)
- Controller Rating: 12V/10 Amp (8" X 4" X 2")
- Battery Bank: One 12V 55 to 75 Ah Deep Cycle Battery
- Battery Size: 10" X 6" X 9" (38 to 53 lbs)

Figured for worst sun days (Winter time). Data is to be verified during prototyping.

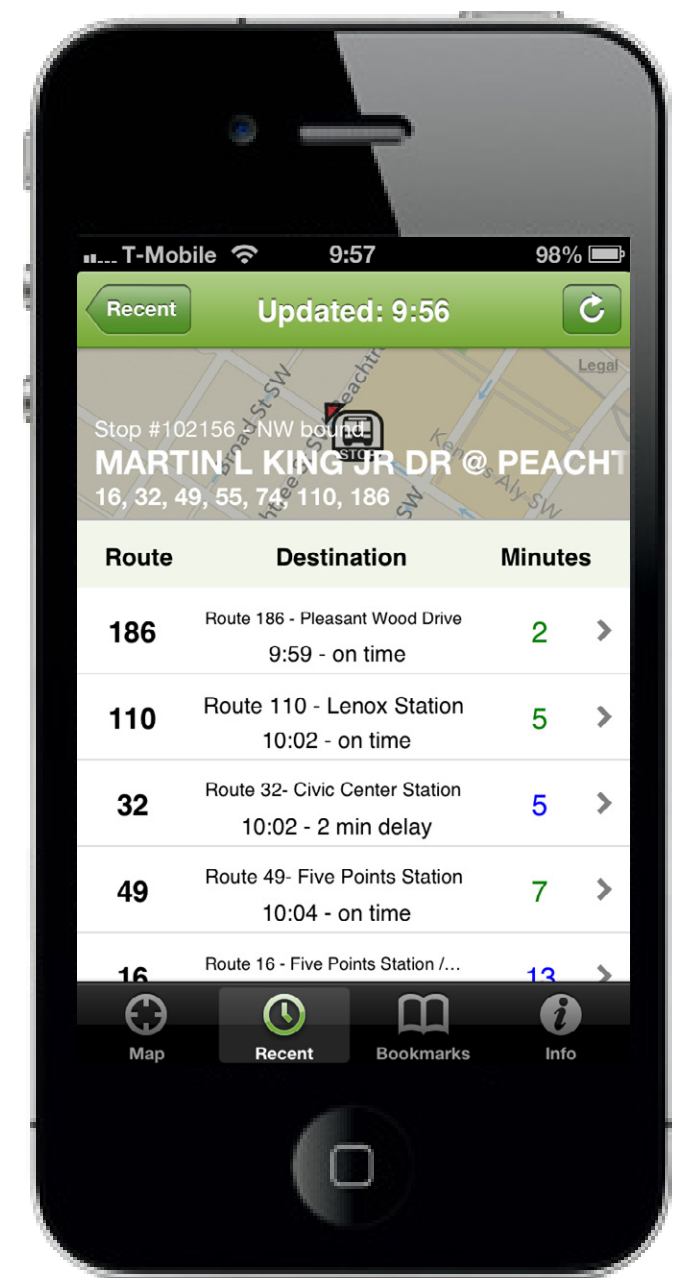
5 Photovoltaic System Estimate  
Scale: NTS

NOTE: Lighting layouts, solar panel size, battery size are rough estimates only. Actual figures would be generated during sign prototyping.

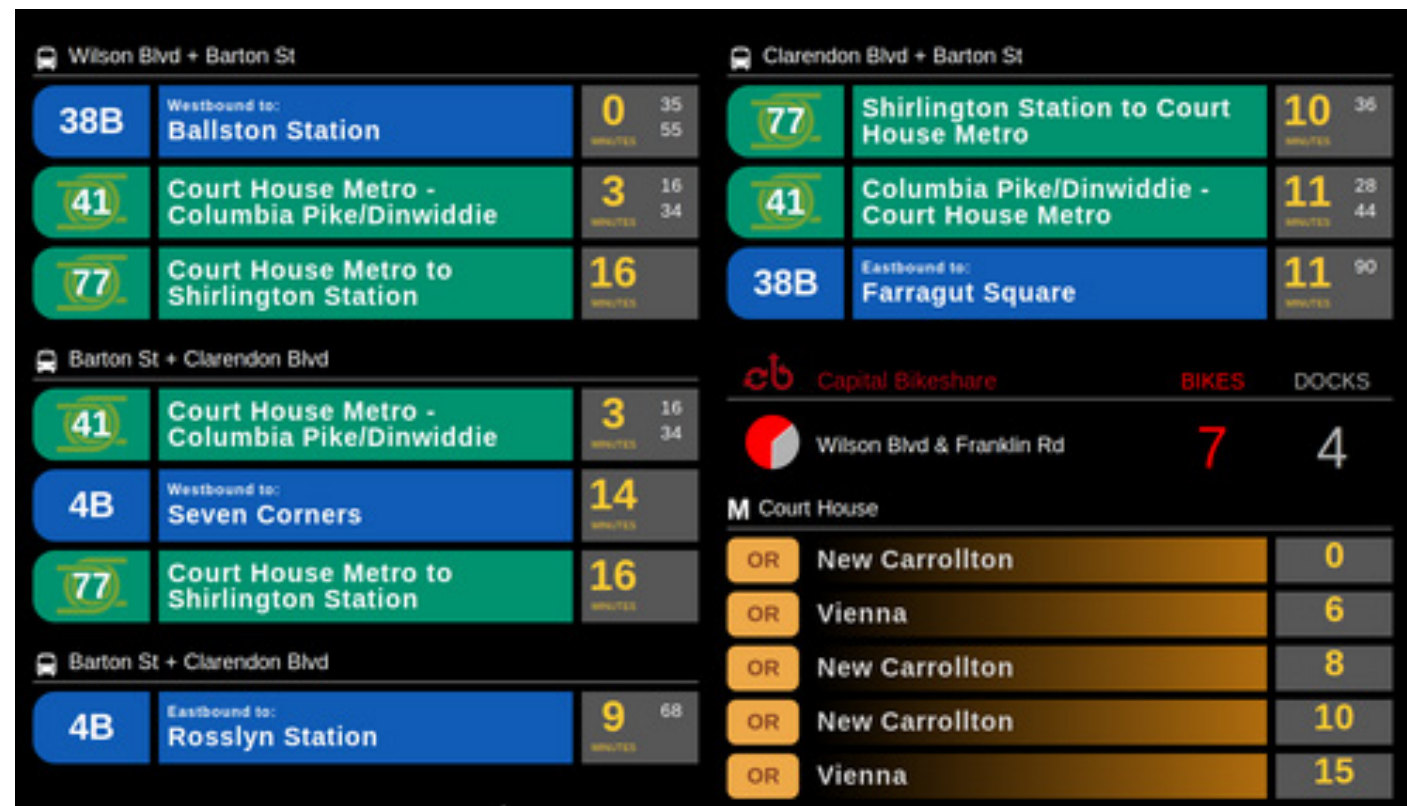
Solar panel location is to be determined on a per-sign location basis so as to avoid tree or building shadows.

Battery and controller locations are to be determined.









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# Appendix D



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**APPENDIX D: SECTION 101400  
IDENTIFYING DEVICES SPECIFICATIONS**

I. "Manual of Uniform Traffic Control Devices" MUTCD current edition.

3.03 SUBMITTALS

3.01 SUMMARY

- A. General: Provide Signage and Graphic Products in accordance with requirements of the Contract Documents.
- B. Work Included: Perform all work necessary to complete and install all sign and graphic products including supports and mounting hardware, as shown on the drawings or inferable therefrom and/or as specified herein in accordance with the requirements of the Contract Documents. Work shall include obtaining all necessary permits from applicable agencies.
- C. Subcontractors: Within 5 working days of notification, the successful bidder shall submit the names of all Subcontractors for review and approval. The approval or disapproval of any Subcontractor will not relieve the Signage Contractor of his responsibility for the performance of the Work as called for under the Contract Documents, nor will approval of a particular Sub-contractor be construed as approval of any particular process or material.
- D. Future Purchase of Signage: Signage Contractor shall furnish cost information for future purchases (guaranteed up to 1 year from substantial completion) for all signs and graphic products in these documents; information shall include costs for items ordered individually as well as minimum order required to obtain price break.
- E. If this specification is a component of a complete Architectural project specification, any conditions or requirements stated within the Signage specification that are less-stringent than those stated in the Architectural project specification do not in any way relieve the Signage Contractor from compliance with the terms of the Architectural project specification. Any conflicting conditions or requirements should be reported to and resolved with the Atlanta Regional Commission (ARC/Owner) and Architect.

3.02 REFERENCES

- A. Americans with Disabilities Act (ADA) legislation, published in the Department of Justice Federal Register. [www.ada.gov](http://www.ada.gov)
- B. "ADA Standards for Accessible Design", as published in the Title III regulations (28 CFR Part 36, revised March, 2010 or most recent revision) issued by the Department of Justice. The ADA Standards for Accessible Design are in Appendix A of the Title III Regulations, <http://www.ada.gov/stdspdf.htm>
- C. "ADA Accessibility Guidelines for Buildings and Facilities", current revision, <http://www.access-board.gov/adaag/html/adaag.htm>
- D. "Architectural Barriers Act Accessibility Guidelines"
- E. "The Americans with Disabilities Act White Paper Update 2006: Guidelines, Best Practices and Innovation for Signs for the Blind and Visually Impaired," published by the Society for Environmental Graphic Design, Society for Environmental Graphic Design; 401 F Street NW, Suite 333; Washington, DC 20001; 202.638.5555, [www.segd.org](http://www.segd.org)
- F. "American National Standard Institute: Accessible and Usable Buildings and Facilities" ICC/ANSI A117.1A-1998, current revision, published by the International Code Council. [www.ansi.org](http://www.ansi.org)
- G. "Instruction Manual for Braille Transcribing" Fourth Edition, 2000, National Library Service for the Blind and Physically Handicapped, Library of Congress, 888-657-7323, [www.loc.gov/nls/](http://www.loc.gov/nls/)
- H. "English Braille, American Edition, 1994" American Printing House for the Blind, [www.braille.org/ebae](http://www.braille.org/ebae)

- A. Procedures: Not later than 20 working days from the Contract Date, the Signage Contractor shall provide the specified items noted on the Submittal Schedule "APPENDIX A" included at the end of this specification section. Except for the quantities required for producing samples and mockups, fabrication shall not begin nor shall orders be placed for materials until Signage Contractor has obtained approvals on submittals. Signage Contractor shall notify the Owner of any items that require excessive lead times and may require expedited ordering.
- B. Signage Contractor's Shop Schedule: Submit for fd2s' information not less than 5 working days from the Contract Date an updated comprehensive fabrication schedule "Exhibit I", if required. Schedule shall be augmented with detail delivery and expected fd2s' response times for all signage/graphic products, and shall include overview schedule information for anticipated shop activity for each sign type, including delivery of outsourced items, completion of major subcomponents, and any crucial fabrication milestones, especially those that are affected by fd2s' response times. Substantial Completion and Final Due dates shall not be altered, unless otherwise stipulated in writing by Owner and/or Owner's Representative.
- C. Product Data: Submit for fd2s' action, electronic documentation in PDF or other standard format, a material list with technical data documenting the primary function, quality, and performance of each system to be used in the Work or other such primary characteristics as required by the Drawings or Specifications.
- D. Manufacturer's Data: For all non-custom items, materials, subassemblies, etc., submit to fd2s for review only, electronic documentation in PDF or other standard format, manufacturer's specifications and installation instructions for "sign" to show compliance with these specifications.
- E. Typeface samples: Provide for fd2s' action, two sets of laser prints of typeface samples with a full character set to match those of the "Typography" section of the Contract Documents at 72 point size. Samples are to be produced on the same device as that used to produce digital artwork, film negatives, and/or router outlines.
- F. Shop Drawings: Submit for fd2s' action, electronic documentation in PDF or other standard format, shop drawings for the fabrication and installation of the Work. Prepare details at not less than 3" = 1'-0" minimum scale with critical points at full scale. All shop drawings shall be explicit in depicting materials, material grades and thicknesses, finishes, substructure, footings, fabrication joints, corners, edges, intersections, fasteners and copy composition including letter and line spacing.
- G. Samples: Submit for fd2s' action, three (3) sets of samples of each finish, color and lettering type required, one set which will be returned with appropriate action noted. Color samples shall be 6" x 6" and shall be on same or similar substrate to finished product and shall be treated with any specified protective films or coatings. Material and metal finish samples shall be 6" x 6" and shall be same gauge as finished product where reasonable. Label samples to indicate product, characteristics, and locations in the Work. Samples will be reviewed for color and appearance only. Compliance with all other requirements is the exclusive responsibility of the Signage Contractor.
- H. Mock-ups: Submit one of each for fd2s' action as outlined in the "Submittals Schedule" at the end of this specification section. Submittals are required by fd2s to assist in performing the work in a manner consistent with the Contract Documents and to insure the best possible construction and quality of finished product. They should be identical to the anticipated production run, and should be complete and assembled. These mock-ups will serve as quality control standards throughout the life of the production run. The review of submittals in no way shall relieve the Signage Contractor of responsibility to provide signage of a quality level consistent with these Contract Documents.
- I. Copy Layouts: Submit two copies for the Owner's action, full-size, laser or plotter prints (color or black text on white bond paper) of all UNIQUE sign faces with actual fabrication-ready formatting. Samples are to be produced on the same



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**PAGE TITLE / ELEMENT TYPE**  
**Appendix D  
Section 101400**

**SHEET NUMBER**  
**D1.0**

device as that used to produce camera artwork and/or router outlines. Layouts will be reviewed for composition, letter spacing, font usage, and copy fitting. Electronic files are not acceptable unless approved by the designer.

J. In addition, after shop drawing approval and as part of the shop drawing process, submit all sign face layouts in electronic PDF format as follows:

All layouts shall be annotated to indicate location, as per Message Schedule and Sign Location Plan conventions. Layouts can be ganged onto a single page/plot (minimum 11" x 17" and not to exceed 30" X 42") Laser prints which, at full-size, will exceed the dimension of 30" x 42" may be submitted at the largest scale that will fit on a 30" x 42" sheet. Output shall be of sufficient resolution that visual integrity of the layout may be inspected, but in no case shall the scale be less than 3" = 1'-0". Copy accuracy and/or spelling will not be reviewed; it is the responsibility of the Signage Contractor to conform to the Message Schedule as submitted.

All layout shall be submitted at a standard architectural scale.

Some samples will be required to be submitted at actual size or a specific architectural scale and on the actual final material as noted in Exhibit D - Design Intent Drawings and as requested in the Submittal Schedule "APPENDIX A".

K. Structural Drawings/calculations: Submit two copies for the Owner's information. For large, structurally crucial sign types, furnish engineering drawings and calculations to show that maximum stresses and deflections to not exceed performance requirements under full design loading. Drawings and calculations shall be prepared and sealed by a qualified Structural Engineer licensed in the State where the project is located.

### 3.04 STANDARDS

- A. Provide Sign types of the size, material, images and arrangements made up of special and standard components and construction as shown and specified.
- B. All drawings pertaining to general sign configuration, typography, graphic layout, and sign placement are included.
- C. If there is a conflict, stated dimensions on the drawings shall take precedence over scaled dimensions. Signage Contractor shall verify sign and copy length for proper fit and shall notify fd2s in writing of any discrepancies in the documents prior to fabrication.
- D. All materials shall be new stock, free from defects impairing strength, durability and appearance.
- E. All fabrication and installation shall be in accordance with highest standards of the trade. All signs and components shall be complete and free from visual and mechanical defects. (Such as unfilled and unfinished seams or exposed fasteners).
- F. All electrical work must comply with UL standards, N.E.C. requirements, and local jurisdictional requirements.
- G. No fabrication or installation materials or procedures shall be used that will in any way change the visual quality or in any manner have an adverse effect on existing materials, surfaces and environment.
- H. All damaged signing surfaces and materials incurred shall be restored to original condition and appearance or replaced by the Signage Contractor.
- I. All copy noted on contract documents to be Braille, shall be Grade 2 Braille to match the performance and use specifications of Title III of the Americans with Disabilities Act, Public Law 101-336. It shall be the responsibility of the Signage Contractor to verify accuracy of all Braille messages.

### 3.05 QUALITY ASSURANCE

- A. Signage Contractor's Quality Assurance Responsibilities: Signage Contractor is solely responsible for quality control of the Work and its installation.
- B. Regulatory Requirements: Signage Contractor is solely responsible for complying with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and Municipal authorities having jurisdiction. Obtain necessary approvals and permits from all such authorities.

### 3.06 DELIVERY, STORAGE, AND HANDLING

- A. General: Unless otherwise stipulated or agreed to in writing from the Owner, Signage Contractor is responsible for storage and delivery of all materials until installation. Specific on-site storage needs shall be coordinated with the Owners' representative and/or General Contractor.

### 3.07 PROJECT/SITE CONDITIONS

- A. Weather Conditions: For exterior concrete or painting/finish work, do not proceed with the Work during inclement weather nor when weather forecasts are unfavorable, unless the Work will proceed in accordance with the manufacturer's requirements and instructions.
- B. Site Readiness: Unless otherwise requested, do not install signs until underlying and adjacent surfaces are completed. Coordinate installation timing with all other applicable trades.

### 3.08 WARRANTY

- A. Guarantee: The Signage Contractor shall guarantee all workmanship and material used to manufacture and install the signage product he has furnished as follows: General workmanship and materials shall be guaranteed for a period of one year. Applied finishes (paint, vinyl, silk-screening) shall be guaranteed for a period of seven years. Electrical components shall be guaranteed to the extent of the electrical components manufacture's guarantee. If during the guarantee period any defects or faulty materials are found, he shall immediately upon notification by the Owner, proceed at his own expense, to replace and repair same, together with any damage to all finishes, fixtures, equipment and furnishings that may be damaged as a result of this defective equipment or workmanship.

### 3.09 MAINTENANCE

- A. Record Drawings: Furnish record drawings annotated with the changes made during shop drawing reviews and/or installation of the Work so as to be a complete set of "as-built and installed" plans. Drawings shall include any applicable wiring diagrams, as well as the locations and methods of any concealed fasteners or access areas. Any installation, service, or removal "tricks" or methods should be communicated graphically/verbally as required.
- B. Maintenance and Removal: Signage Contractor shall provide written instructions for removal of interior signs from wall surfaces including recommended methods for removal of residual adhesives. Signage Contractor shall provide written instructions for the Owner to follow proper maintenance.
- C. Graffiti Resistance: Signage Contractor shall provide written documentation listing each sign that has been treated with a graffiti-resistant film or coating and identifying the product or products used on each. Documentation shall include manufacturer's recommended materials or products to be used for removal of graffiti from each graffiti-resistant film or coating. Signage Contractor shall provide manufacturer's written instructions for maintaining all graffiti-resistant films or coatings used.

### 3.10 ELECTRONIC COMPONENTS

- A. Protection: Protect all electronic components as required by manufacturer and to prevent tampering.
- B. Contamination: Proper measures shall be taken as required by manufacturer to prevent foreign objects or liquids to contaminate the electronics such as (but not limited to) water, cleaning solutions, sand, dirt and the like.
- C. Ventilation: Ventilation shall be provided to all electronic components as required by the manufacturer of such component. Fabricator shall be liable for overheating of electronic components that render them useless or failure to perform as specified.

### PRODUCTS

### 3.11 FABRICATION: GENERAL

- A. All fabrication shall be executed in such a manner that all edges and corners of finished letter forms and sign substrates are true and clean. Letterforms and signs with rounded positive and negative corners, nicked, cut or ragged edges, bent or distressed edges etc. will not be accepted.
- B. All finishes shall be executed in such a manner that all surfaces shall have a smooth even finish and are free of any and all irregularities.
- C. All letterforms shall be so aligned as to maintain a baseline parallel to the sign format. Margins shall be maintained as specified by sign type layouts.
- D. All edges of letterforms shall be sharp and clean with no edge buildup or bleeding. All surfaces of letterforms shall be without pinholes.
- E. Sheet metal letterforms and other items shall be cut from rolled sheet of specified gauge, all edges of copy to be perpendicular to copy face, ground smooth and polished to finish as noted on drawings and schedules. No surface deflection, "oil-canning" or warping will be tolerated.
- F. All signs and copy noted on drawings as acid-etched or photopolymer shall be photo chemically etched to a depth of 1/32" unless otherwise shown on the drawings. Etched surfaces shall be paint filled or sprayed in color noted on drawings. All etching shall be executed in such a manner that all edges and corners of finished copy or graphics are true and clean. Contours of Braille etching shall comply with Braille standards.
- G. All engraving is to be computerized CNC engraving systems. Engraving to be uniform depth of 1/32" with no visible tooling marks.
- H. All copy noted as sandblasted shall be blasted utilizing the appropriate texture of blasting silica to achieve consistent depth. Careful control of nozzle pressure, distance and angle is necessary to prevent distortion.
- I. All silk-screens shall be executed from photo-screens or negatives prepared per specification and drawings. Silkscreen mesh shall be 390 or finer. Signage Contractor shall not use images as shown in the Contract Documents as camera ready art.
- J. All silkscreen printing shall be executed in such a manner that all edges and corners of finished letterforms are true and clean. Letterforms with rounded positive or negative corners, edge buildup or bleedings, etc. will not be accepted.

- K. Preparation, primer and semi-gloss polyurethane acrylic base finish coats to provide weather resistant finish guaranteed for seven (7) years against pitting, peeling, or fading. Polyurethane coating provided for use on surfaces shall have properties of moisture resistance in all weather conditions and shall be guaranteed for seven (7) years against pitting, peeling or fading.
- L. No paints that will fade, discolor, or de-laminate as a result of ultraviolet light or heat shall be used.
- M. All paints required for lettering including silk-screens and imprinted surfaces shall be a type made for the surface material on which it is applied and recommended by the manufacturer of the paint. Exact identification of all paints shall be noted on shop drawings, together with data describing the method of application and curing, if other than "air" drying.
- N. All paints shall be evenly applied and without pinholes, orange peeling, debris, scratches, application marks, and other imperfections. Workmanship in conjunction with finishes of signage shall conform to the highest standards of the trade.
- O. Primer coats or other surface pretreatments, where recommended by the manufacturer for paints, shall be included in the work as part of the finished surface work at no extra cost to the Owner.
- P. All exterior signs, sign bodies, or sign components that will be installed within reach of pedestrians shall be treated with a graffiti-resistant film or coating.
- Q. All adhesives as may be required shall be used in accordance with recommendations made by the manufacturer of the material specified to be laminated or adhered. No adhesives that will fade, discolor or de-laminate as a result of ultraviolet light or heat shall be used and shall not change the color of or deteriorate the materials to which they are to be applied. The adhesives shall be of a non-staining, non-yellowing quality and all visible joints shall be free from air bubbles and other defects.
- R. For the fabrication of general metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, roughness, seam marks, and trade names. Unless the surfaces are to be painted, do not use materials that have stains and discolorations.
- S. For exposed items of work that include plain flat surfaces in width of more than 50 times the metal thickness, provide sheet stock from the mill that has been stretcher leveled to the highest standard of flatness commercially available.
- T. Welding, when necessary, shall be of the correct type to minimize permanent distortions of flat surfaces. All welding flux, oxides and discolorations must be removed by pickling or grinding, so that these areas match finish of the adjacent areas. Any damage caused by welding must be repaired by grinding, polishing or buffing. All welded seems shall be in-filled and ground smooth.
- U. Unless exceeded or modified, conform to the Architectural Woodwork Institute Quality Standards and Guide Specifications. All wood specified shall be solid, meeting or exceeding Architectural Woodwork Institute Quality Standards (AWI) Section 100 Premium Grade.
- V. Signage Contractor shall be responsible for the accurate seating and leveling of all anchor bolts.
- W. All illuminated signage shall illuminate evenly without hot or cold spots and without shadowing or show-thru of internal components either when turned on or left off.
- X. All signs located in the "Clear Zone" of a 50mph (or greater) roadway, which is included as part of the National Highway System or as required by GADOT and/or local city ordinances, shall be installed with an approved breakaway base assembly.



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PAGE TITLE / ELEMENT TYPE  
**Appendix D  
Section 101400**

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### 3.12 MATERIALS

A. Anchors and Inserts: Either furnish inserts to be set in concrete work, or provide other anchoring devices as required for the installation of signs as specified on drawings. Furnish cast iron, or malleable iron ore hot dip zinc coated inserts. Provide toothed stainless steel, galvanized or zinc-and-chrome-plated high carbon steel expansion bolt devices for drilled in place anchors.

1. "Thunderstud", Concrete Wedge Anchor, [www.confast.com/products/thunderstud-anchor.aspx](http://www.confast.com/products/thunderstud-anchor.aspx)
2. "Kwik Bolt", Hilti Fastening System, [www.hilti.com](http://www.hilti.com)
3. Breakaway Anchors: Dent Breakaway Bolts, [www.dentbreakaway.com](http://www.dentbreakaway.com)

#### B. Metals:

4. Aluminum: AA Alloy 5052, 6061T6, 6063T6 or as recommended to suit required service and finish. Exposed aluminum is to carry Protective Finish as per this specification.

#### 5. Steel:

##### a. Materials:

- i. Steel Pipe shall conform to ASTM A53, Type E, F., or G at fabricators option, Grade A, black finish unless otherwise shown as galvanized standard weight, (Schedule 40).
- ii. Steel sheet for cold forming shall conform to ASTM A 569, hot-rolled sheet steel of commercial quality, pickled and oiled, free of defects which would impair the work.
- iii. Galvanized steel sheet shall conform to ASTM A 526, commercial quality.
- iv. Finishing - Primer: Provide in strict accordance with paint manufacturer's recommendations as required for proper adhesive and application of finish unless steel indicated to receive galvanized finish.
- v. Finishing - Baked enamel finish: Provide manufacturer's standard baked enamel finish.

6. Stainless Steel: Type 302/304/316 Alloy with sheet finish as noted on Drawings. Unless otherwise shown or specified, provide stainless steel finishes as follows (AISI Designations):

- i. No. 4 (Bright, Directional Polish)
- ii. No. 8 (Highly Reflective, mirror Finish Polish)

7. Aluminum Composite Material (ACM): Provide lightweight aluminum panels in thickness' specified. Panels shall consist of two sheets of smooth thin gauge aluminum thermobonded to a polyethylene core in a continuous process. Pre-finish with a premium, resin based, fluoropolymer (Lumiflon), Kynar or Polyester coil coat (as recommended by the manufacturer for the specific use and location of the sign) in the color and finish specified. Apply graphics as specified in drawings. If graphics are direct to surface digital printing, provide a substrate compatible with flatbed printers and UV curable inks.

a. Alpollic® and Graphic-Alt™, Mitsubishi Plastics Composites America, Inc., <http://www.alpolic-usa.com/>

b. Alucobond® or Dibond®, Alcan Composites, <http://www.alcancompositesusa.com/>

B. Metal Fasteners: Galvanized Steel finished to match metal work. For machine screws, comply with Industrial Fastener Institute (IFI), Countersunk Phillips flat head where exposed unless otherwise shown.

#### C. Acrylic

1. Furnish acrylic in the thickness and finishes as specified and as manufactured by one of the following or approved equal:

- a. Acrylite SG, [www.USPlastic.com](http://www.USPlastic.com)
- b. Aristech, [www.aristechacrylics.com](http://www.aristechacrylics.com)
- c. Mitsubishi Rayon Co., LTD, [www.mrc.co.jp/english](http://www.mrc.co.jp/english)
- d. Rohm and Haas, [www.rohmhaas.com](http://www.rohmhaas.com)
- e. Altuglas Plexiglass, <http://www.plexiglas.com/>

D. Photopolymer: Photopolymer is to carry an 80 shore D durometer hardness and ultraviolet inhibitors. Photopolymer is to be permanently adhered to substrate.

1. Nova Polymer, NovAcryl, NovEx, [www.novapolymers.com](http://www.novapolymers.com)

E. Adhesives: Furnish adhesives as specified and as manufactured by one of the following or approved equal:

1. 3M VHB Acrylic Foam Tape 4950, [www.3m.com](http://www.3m.com)
2. Silicone adhesive - Ready to use, high performance adhesive. General Electric GE1200 sealant, translucent SCS 1201 or equal, as recommended by manufacturer for bonding condition.
3. 3M Double Coated Tape 415 Clear, [www.3m.com](http://www.3m.com)
4. Dow Corning 999-A Silicone Building & Glazing Sealant 999, [http://www.dowcorning.com/content/construction/weather/999a\\_color\\_chart.asp](http://www.dowcorning.com/content/construction/weather/999a_color_chart.asp)
5. Epoxy - Two component thermosetting epoxy adhesive with 100% solid content.
6. 3M Dual Lock industrial Velcro, [www.3M.com](http://www.3M.com)
7. 3M DP Scotchweld Adhesives, [www.3m.com](http://www.3m.com)
8. Lord Engineered Adhesives, [www.lord.com](http://www.lord.com)
9. Wood – Contact type, unless otherwise recommended by manufacturer for type of installation required.

#### F. Coatings



1. Acrylic Polyurethane Enamel: Provide an aliphatic polyurethane enamel consisting of ultra-violet inhibitors which are lightfast, weather, abrasion and wear resistant. Provide only products that deliver a maximum applied VOC of 2.8 (for latex) or 3.5 (for oil-based) pounds per gallon. Provide products that are Green Seal certified where performance is comparable to higher-VOC products.

- a. VOC MAP, Matthews Paint, [corporateportal.ppg.com/na/refinish/matthews/default.htm](http://corporateportal.ppg.com/na/refinish/matthews/default.htm)
- b. Grip-Gard, Akzo Nobel, [www.signfinishes.com](http://www.signfinishes.com)

2. Translucent Sign Coating: Provide Gripflex Intermix Sign Paint available through Akzo Nobel. Coat with Gripflex Solar Clear (10AFRO2266) when used first surface.

- a. [www.signfinishes.com](http://www.signfinishes.com)

3. Acrylic Latex: 100% acrylic latex suitable for exterior use on concrete masonry surfaces. Finish shall be satin applied per the manufacturers recommendations.

- a. Benjamin Moore Paint, <http://www.benjaminmoore.com>
- b. California Paints, <http://www.californiapaints.com/ExteriorPaint.html>
- c. Pratt & Lambert Paints, <http://www.prattandlambert.com/>

4. Reflective Coating: The interior of all illuminated letters or sign cabinets shall have an applied reflective coating to enhance and evenly distribute light output. Apply per the manufacturers recommendations.

- a. Star-bright White, Spraylat Sign Coatings, [www.spraylat.com](http://www.spraylat.com)
- b. Matthews 281 500SP High Reflective White
- c. 3M, 3635-100 Light Enhancement Film

5. Protective Finish: For all surfaces noted to receive protective clear finish, apply two coats for of clear acrylic polyurethane. Sheen as specified in drawings. Coating shall be compatible with inks or paints applied to surfaces.

- a. VOC MAP, Matthews Paint, [www.corporateportal.ppg.com/na/refinish/matthews/default.htm](http://www.corporateportal.ppg.com/na/refinish/matthews/default.htm)
- b. Grip-Gard, Akzo Nobel, [www.signfinishes.com](http://www.signfinishes.com)

6. Silk Screen: Enamel inks shall be in colors and sheen as shown and be manufactured by the following or approved equal:

- a. Nazdar Co., Chicago, IL., [www.nazdar.com](http://www.nazdar.com)
- b. 3M Screen printing Inks 9800 UV Series, [www.3mgraphics.com](http://www.3mgraphics.com)

G. Vinyl Machine-Cut Artwork: Computer-driven machine cut letters in thickness as specified below, selected from standard colors.

1. Opaque Applications

- a. 3M 7125 or 7725 series - 2 mil cast vinyl, [www.3m.com](http://www.3m.com)
- b. Avery A7 Reflective or A9 series - 2 mil cast vinyl, [www.averyvinyl.com](http://www.averyvinyl.com)
- c. Oracal 951 Series - 2 mil cast vinyl, [www.oracal.com](http://www.oracal.com)

2. Standard Retro-Reflective Applications

- a. 3M 680 series - 7 mil cast vinyl, [www.3m.com](http://www.3m.com)
- b. Avery A7 Reflective, Engineer Grade – 7 mil cast vinyl, [www.averyvinyl.com](http://www.averyvinyl.com)
- c. Oracal 5500, 5700 and 5800 Series – 5, 6 or 10 mil cast vinyl, [www.oracal.com](http://www.oracal.com)

3. High-Intensity Retro Reflective Applications

- a. 3M High Intensity Prismatic Sheeting, [www.3m.com](http://www.3m.com)
- b. Oracal 5800 series – 10 mil /10 year, [www.oracal.com](http://www.oracal.com)

4. Backlit applications

- a. 3M 3630 series - 3mil cast vinyl, [www.3m.com](http://www.3m.com)
- b. Avery A6 Translucent series - 3 mil cast vinyl, [www.averyvinyl.com](http://www.averyvinyl.com)
- c. Avery A9 Translucent series - 2.3 mil cast vinyl, [www.averyvinyl.com](http://www.averyvinyl.com)
- d. Oracal 8800 and 8500 Series – 2 and 3 mil cast vinyl, [www.oracal.com](http://www.oracal.com)

H. Pavement Markers:

1. Preformed Thermoplastic: Applications in shapes, sizes, and colors as described in the Contract Documents. Comply with Section 84-2 of the Caltrans Standard Specifications - Thermoplastic Traffic Stripes And Pavement Markings. [http://www.dot.ca.gov/hq/esc/oe/specifications/std\\_specs/2006\\_StdSpecs/2006\\_StdSpecs.pdf](http://www.dot.ca.gov/hq/esc/oe/specifications/std_specs/2006_StdSpecs/2006_StdSpecs.pdf).

- a. 3M™ Pavement Markings ([http://solutions.3m.com/wps/portal/3M/en\\_US/Traffic\\_Safety/TSS/Offerings/Products/Pavement\\_Markings/](http://solutions.3m.com/wps/portal/3M/en_US/Traffic_Safety/TSS/Offerings/Products/Pavement_Markings/)).
- b. DecoMark® by FlintTrading ([www.flinttrading.com](http://www.flinttrading.com)).
- c. Or equal

2. Preformed self-adhesive: Bonded, solid color polymer, layered markings with pressure-sensitive adhesive.

- a. Advance Traffic Markings ([www.trafficmarking.com](http://www.trafficmarking.com))
- b. Or equal.

I. Electrical: All signs noted as illuminated, will be illuminated with high output 0° rated ballast and fluorescent tubes. Tube color is noted in sign specifications. All units are to carry U.L. certification and are to meet all applicable City, County



and/or State codes. Power and load is to be determined on a case-by-case basis. Signage Contractor is to coordinate power and load requirements with electrical engineer and electrical contractor.

J. LED: All units are to carry U.L. certification and are to meet all applicable City, County and/or State codes. Power and load is to be determined on a case by case basis. Signage Contractor is to coordinate power and load requirements with architect and general contractor.

1. LED lighting shall have a minimum of 50,000 hours of life prior to reaching 70% of illumination capacity.
2. Sign contractor is to submit relevant cut sheets and data specifications for each LED product used.
3. All LED lighting, unless otherwise stipulated in drawings, shall be of the same manufacturer and of the same color temperature.
4. Unless otherwise stipulated in drawings, illuminated cabinets and letterforms shall be evenly illuminated such that there are no visible hot spots or shadows from internal components. Sign contractor shall get written approval for fabrication of signage that is designed in such a way that even illumination is compromised or not possible. Sign contractor shall get written approval on required sign modifications to produce even illumination which may alter the visual aesthetic of the sign cabinet or letterform.

K. Wood: For rough and finish wood, conform to ASTM D245. Wood shall be seasoned to a maximum of moisture content of 19%. Meet or exceed the following scheduled grades according to use and species:

1. Pine-Southern Pine Grade No. 2
2. Fir-Douglas Fir (except South) Standard Grade
3. Birch-AWI Premium Grade

L. Sheet Magnets: Provide 1/32" thick sheet magnets as manufactured by:

1. Magnetic Technology [www.magtech.cc](http://www.magtech.cc) or approved equal

M. PVC: Provide lightweight rigid moderately expanded closed-cell polyvinyl chloride (PVC) extruded sheet from manufacturer in thickness specified. Visible edges shall be treated with a filler and sanded smooth.

1. Sintra®, Alcan Composites, [www.alcancompositesusa.com](http://www.alcancompositesusa.com)
2. Komacel®, Kommerling USA Inc., <http://www.kommerlingusa.com/FAQ.html>

N. Graffiti-resistant Films and Coatings: Provide films or coatings appropriate to the material or substrate to which they are applied. Apply films and coatings according to the manufacturers' recommendations.

1. 3M Scotchcal Graphic and Surface Protection Films 8991 and 8991R, [www.3m.com](http://www.3m.com)
2. DuPont Imron 3.4 HG-C, [www.performancecoatings.dupont.com](http://www.performancecoatings.dupont.com)
3. Ecological Coatings 1800 Series Clear Anti-Graffiti Coating, [www.ecologicalcoatings.com](http://www.ecologicalcoatings.com)
4. MaxAll, [www.graffitisolutions.com](http://www.graffitisolutions.com)

5. Matthews Paint 6178SP High Performance Clear, [corporateportal.ppg.com/na/refinish/matthews/default.htm](http://corporateportal.ppg.com/na/refinish/matthews/default.htm)
6. New Dimensions Solutions Graffiti Shield System, [www.ndclean.com](http://www.ndclean.com)
7. Prosoco Sacrificial Coating SC1, [www.prosoco.com](http://www.prosoco.com)
8. Prosoco Sure Klean Weather Seal Blok-Guard & Graffiti Control 2, [www.prosoco.com](http://www.prosoco.com)
9. Ritama RI-6481 Anti-Graffiti, [www.ritama.com](http://www.ritama.com)
10. Soy Technologies, LLC, SoyStop Anti-Graffiti Barrier, [www.soytek.com](http://www.soytek.com)
11. Superfrog Signs & Graphics, Frog Shield, [www.superfrog.com](http://www.superfrog.com)
12. Tiger Drylac USA, Series 44 Anti-Graffiti, [www.tigerdrylac.com](http://www.tigerdrylac.com)

O. High-pressure Laminates: Provide decorative surface papers, impregnated with melamine resins, bonded under heat and pressure to kraft papers impregnated with phenolic resins. Provide materials in patterns and finishes as specified in the drawings. Provide general surface type, vertical surface type, and/or post-forming type as recommended by the manufacturer. Provide adhesive types as specified in manufacturer's printed installation instructions.

- a. Fossil Industries, <http://www.fossilgraphics.com/>
- b. iZone Imaging, <http://www.izoneimaging.com/>
- c. KVO Industries, <http://www.kvoindustries.com/signage.html>
- d. Chemetal®, [www.chemetalco.com](http://www.chemetalco.com)
- e. Formica®, [www.formica.com](http://www.formica.com)
- f. Nevamar®, [www.nevamar.net](http://www.nevamar.net)
- g. WilsonArt®, [www.wilsonart.com](http://www.wilsonart.com)

P. Digitally-printed Graphics: Provide permanent adhesive vinyl film with satin liquid laminate for application to the specified substrate.

1. Adhesive Vinyl Film: Avery 2010 vinyl or equal, white. Avery MPI 2120 Matte White vinyl or equal.
2. Solvent based printer: HP DesignJet 10000, 6-color.
3. Inks or toner: UV-resistant.
4. Unless otherwise noted in drawings, apply Avery Dennison High Performance Vinyl "HP" HP DOL 2070 Luster Over-laminate or equal over digital prints.
5. Unless otherwise noted in drawings, the minimum resolution for digital printing on vinyl or other substrate shall be 750 DPI.



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**Section 101400**

**SHEET NUMBER**  
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### 3.13 WEATHER PROOFING

- A. Water & Humidity: All exterior sign cabinets shall be sealed as to prevent rain water contamination. Proper venting and drainage shall be provided for humid or wet locations for all exterior or interior sign cabinets. All exposed metal surfaces shall be protected from oxidation.
- B. Heat & Cold: All material used shall be rated to withstand typical hot or cold conditions associated with the region in which they will be installed.
- C. Electronics: All electrical connections and electronic components in exterior signs shall be properly sealed or protected from damage by local weather conditions including heat, cold and water. Electronic components that produce or radiate heat shall be properly vented in accordance with the manufacturer's guidelines. Select equipment that is rated to withstand typical environmental conditions associated with the region or location in which it will be installed.
- D. Sign contractor shall, at his expense, replacement of failed electronic/electrical components that are not rated to withstand typical environmental conditions associated with the region or location in which they are installed or that are not properly installed per the manufacture's recommendations. Furthermore, replacement of failed components shall include other components that are damaged or have been severely affected by the failed component as to render them useless or shorten their lifespan considerably.
- E. Signage Contractor shall not be held liable for any damages caused by natural disasters such as, but not limited to, tornadoes, hurricanes, earthquakes, flooding and the like, unless otherwise noted on the drawings.

### 3.14 SIGN CONSTRUCTION

- A. All anchorage is to be reviewed and accepted by the Owner. The Owner is to be notified in writing of any conditions detrimental to proper and timely installation of the sign work.
- B. Letters and signs to be structurally designed as required to withstand wind loads and thermal movements without distortions or excessive deflections according to local codes and ordinances. Letter and sign fabrication is to be a complete system including all stiffeners, fasteners, welding, sealants, jointing, miscellaneous pieces and material thickness as required to form high quality workmanship. Connections, angles, shapes and details shown are suggestive and are to be sized, reinforced and detailed as required by the Signage Contractor. Details, anchors, or devices, etc. not shown, are to be submitted for review and acceptance by the Owner before fabrication.
- C. Changes in the visual elements of the system are not to be made without the Owner' review and approval.

### 3.15 INSTALLATION

- A. Inspect all signs for evidence of damage at the site before installation. Sign fabricator is to repair or replace all damaged material prior to installation.
- B. Examine the conditions and substrates under which the installation is to be performed and notify fd2s in writing of any unsatisfactory condition. Do not proceed with the work until the unsatisfactory conditions have been corrected or subsequent change of location has been indicated.
- C. Follow all recommendations and instructions for installation as provided herein (or by the manufacturer in such a case where instructions are provided). Notify fd2s in writing if in your judgment such installation will not provide permanent, rigid installation in the existing conditions.

- D. Install letter and sign units and components at the locations shown or scheduled, securely mounted with concealed fasteners, unless otherwise shown, attach signs to substrates in accordance with manufacture's instructions, unless shown. Provide anchorage and fitting; coordinate location in field with fd2s.
- E. Install, level and plumb at the proper height. Cooperate with other trades for installation of sign units to finish surfaces. Repair or replace damaged units as directed by fd2s or Owner. Installer will coordinate and field measure proper location of sign units, where required, with fd2s.
- F. All installation procedures and required scheduling are to avoid delays or additional costs and shall be coordinated with fd2s and the Owner.
- G. Signage Contractor shall coordinate sign locations with existing mechanical, electrical and plumbing elements and shall notify fd2s in writing of any visual or physical conflicts.
- H. Protect all adjacent surfaces from damage during installation; promptly repair any such damage should it occur.
- I. Following installation, remove all traces of visible tapes, adhesives, wrappings or refuse from the installation.

### 3.16 ADDITIONAL REQUIREMENTS

- A. Sign contractor shall include in the "Contract Documents" any specifications noted in the Design Intent drawings.

END OF SECTION 101400



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# Appendix E



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**SIGN TYPE****REQUIRED**

ALL SIGN TYPES

6"x6" color sample for each unique color/material on actual material as noted in drawings. Three sets for all sign types (vs. three sets for each sign type).

100

Sealed, engineered shop drawings. LED illumination cut sheets, including cut sheets for the LED transformers. Sign prototype installed at a location to be determined by the Owner.

101

Scaled copy layout for each panel assembly. Scaled shop drawings. Submit actual samples of the bus symbol disc and a medium route panel assembly with route panel inserts, including attachment brackets, finished as noted in the sign drawings including attachment brackets.

102

Scaled copy layout for each panel assembly. Scaled shop drawings. Submit actual sample of the bus symbol disc, including attachment brackets, finished as noted in the sign drawings including attachment hardware.

103A

Scaled copy layout for each panel assembly. Scaled shop drawings. Actual attachment bracket as noted in sign drawings.

103B

Scaled copy layout for each panel assembly. Scaled shop drawings. Actual attachment bracket as noted in sign drawings.

ADA Panels

Sample Braille panel as noted in sign drawings of ST101, including mounting hardware. Actual layouts will be specified by Owner.



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