Appalachian National Scenic Trail

SIGN STANDARDS MANUAL

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Section 1: Introduction

Introduction

This Sign Standards Manual was developed by the National Park Service (NPS) to provide consistent signage, messaging, and branding for the more than 2,000-mile Appalachian National Scenic Trail (A.T.). The signage system outlined in these standards is intended to guide, inform, and protect visitors.

The A.T. is cooperatively managed by NPS, the U.S. Forest Service (USFS), the Appalachian Trail Conservancy (ATC), and 31 Trail Clubs (with local management plans). The Trail itself crosses through land that is managed by over 75 different federal, state, and local land-managing agencies. With these unique conditions in mind, the goal of these standards is to:

– Design standards that make the A.T. feel like a cohesive unit and complement the existing design standards of both NPS and partner organizations.

– Establish a recognizable and cohesive "look and feel" for the A.T.

– Develop versatile, multifaceted guidelines that can be adapted and applied in myriad circumstances.

– Provide consistent and legible messaging for visitors at all sites.

– Maximize the effectiveness of each individual sign and the collective sign family.

– Establish guidelines to assist with planning to reduce overall signage clutter.

– Reduce costs by eliminating need for expensive, one-of-a-kind signs.

Overview of Manual

This manual provides information on planning, layout, procurement, fabrication, installation, and maintenance.

When appropriate, this manual references other existing sign standards, such as the *Manual on Uniform Traffic Control Devices* (MUTCD) and the *2010 ADA Standards for Accessible Design*. Because standards are always evolving, it is the sole responsibility of the contractor or sign coordinator to make sure all signage meets current standards and code requirements.

This document has been organized into six sections:

Section 1: Introduction
General overview of the manual, its goals, and how it's organized.

Section 2: Principles and Guidelines
Explanation of the basic principles that define these design standards.

Section 3: Planning and Documentation
Guidelines for developing a comprehensive sign plan for a given project, including how to create a location plan and document existing and proposed signage.

Section 4: Design Standards
Details on the design elements used in the sign layouts, including use of the A.T. logo, typography, symbols, grid, and color palette.

Section 5: Sign Types
Description of all sign types with example layouts.

Section 6: Fabrication & Installation
Details for fabrication and installation.

Section 2: Principles & Guidelines

Introduction

This section describes the principles of these standards, including information on: messaging, location planning, materials, and maintenance.

Each sign type in this manual has been designed with its specific function in mind. For example, signs intended to be read from a moving vehicle are sized larger than signs read by pedestrians; signs that require an immediate decision or response are succinctly worded; and signs relating to traffic and safety utilize standard colors for maximum recognition. All signs follow consistent grids and comply with criteria for accessibility and legibility. It is important to follow these guidelines as closely as possible when planning, locating, and fabricating signage along the Appalachian National Scenic Trail.

Some signs have standard messaging and can be ordered with little to no customization (e.g. Main Identification signs and Parking Control signs); some signs will require customization according to the site (e.g. interpretive exhibits, wayfinding, and regulatory signage).

Sign Type Codes

Each sign type is specified by function and has a four-letter code associated with it. For example, ADVV for Advanced Vehicular Directionals or XING for Trail Crossing Markers. These codes are used throughout the manual. They are also used in combination with a numeric code on location plans and message schedules to indicate sign information at a glance.

See Sign Type Codes chart (*Figure 1*) for a summary and description of all sign codes.

Messaging

Generally, these signs are designed for first-time visitors. For that reason, it is important that messages be brief—use as few words as possible while still communicating clearly. Furthermore, signs intended for vehicular traffic require more brevity than those viewed by pedestrians. Think about what is legible at a "glance."

When deciding on what messages to display on a sign, here are some suggested guidelines:

Sign Type
First, define the type of message that is required at a location and select the appropriate sign type. All signs should convey no more than one concept or thought—with the exception of directional signage. For example, you should not combine a Main Identification sign with a Trail Crossing Marker. The messages are different and appeal to different moments of a visitor's experience—one tells you that you have arrived and the other informs you of important safety information. Combining them dilutes both messages. Concepts are most effective when displayed on separate signs.

Legend
What information is required at that specific point? Only provide information necessary to make a decision at that particular location. Unnecessary information will only confuse visitors. Do not try to anticipate decisions that may be made next. Instead, provide another sign at the next decision point. Navigating the site should feel effortless. Information should progress from general to specific.

Nomenclature
Messages should use familiar language and should be consistent throughout the site.

Figure 1 **Sign Type Codes**

Code	Sign Type	Description
ADVV	Advanced Directional	Gives motorists advanced warning of upcoming turns, exits, and amenities.
ADVT	Advanced Trail Crossing	Placed on roadways prior to trail crossings to alert motorists to pedestrian traffic.
XING	Trail Crossing Marker	Alerts motorists and pedestrians of the exact location of a potentially hazardous crossing.
MAIN	Main Identification	Clearly identifies the site for motorists and pedestrians; acknowledges the site as part of the Appalachian National Scenic Trail; lists local trail club(s) who maintains the site and all associated partners.
VEHD	Vehicular Directional	Used only within the park boundary to direct vehicles to destinations.
PARK	Parking Control	Used to regulate parking areas.
PEDD	Pedestrian Directional	Directs pedestrians from their vehicles to amenities in the immediate vicinity, such as restrooms, maps, trailheads, etc.
INFO	Information Kiosk	Provides interpretive, operational, and other relevant information to pedestrians.
ETIQ	Etiquette Marker	Provides regulatory and safety information to pedestrians.

Hierarchy
Consider the hierarchy of information when organizing messages. Western cultures read left to right, top to bottom. Generally, the most important message should appear on the first line.

There is an exception for directional signage. For wayfinding, there is specific criteria that determines the order in which destinations are listed. These criteria are the same across all traffic control and wayfinding standards. The order is determined by:

– First organize destinations by *direction*. List those that are straight ahead (up arrow) first, then destinations to the left, then to the right.

– If there is more than one destination in any direction (e.g. both the trailhead and restroom are to the left) organize next by *proximity*—closest to furthest.

– If more than one destination is in the same direction and the same distance away, the messages are then organized alphabetically.

Positive Tone
When possible, present messages with positive phrasing, unless it is confusing. For example: "Please keep pets leashed" instead of "Dogs not permitted off leash."

Panel Design

The following elements were considered in the design of the sign panels in this manual.

Legibility
An effectively designed sign integrates clear, succinct messaging with legible, well-spaced typography that is appropriately sized for the distance and speed at which it will be viewed.

There are four components to legibility that should be considered:

Pure legibility is the maximum distance at which a sign can be read under optimum conditions (e.g. no distractions and unlimited time).

Glance legibility is the measure of how well a sign can be read in passing. For example, when a driver has only a moment to glance at a sign as they drive by.

Target value is the measure of how well a sign panel stands out from objects in the background.

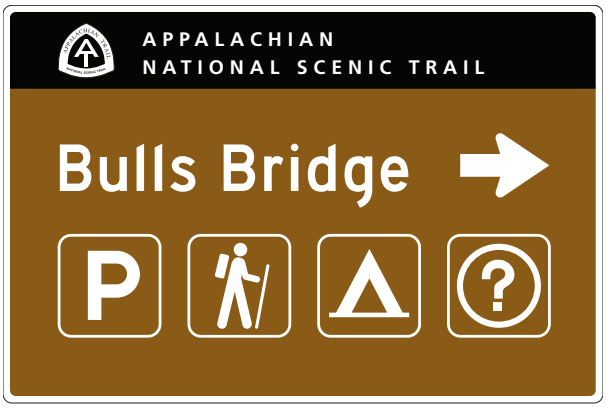
Priority value is the hierarchy of which sign should be seen first among a number of signs (e.g. a Main Identification sign has a higher priority value than an Etiquette Marker).

Format
All the sign types in this manual follow a similar format. As a whole, they make up what is called a sign family—meaning they all have a similar "look and feel." The continuity of design allows visitors to quickly recognize site signage and messaging because it becomes familiar.

If any signage is required at a site that is not covered in this manual, that signage should follow the basic principles and guidelines outlines in this manual so as to fit into the sign family and be easily recognizable to visitors as official signage.

Background
The "empty" space on the sign panel around the sign legend is important for overall readability of the sign. This border creates a field that separates the message from everything else in the surrounding environment—which ultimately increases the target value. If graphics are too close to the edge of the sign panel, they may

appear to bleed off the edge when viewed from a distance and the sign will be less legible.



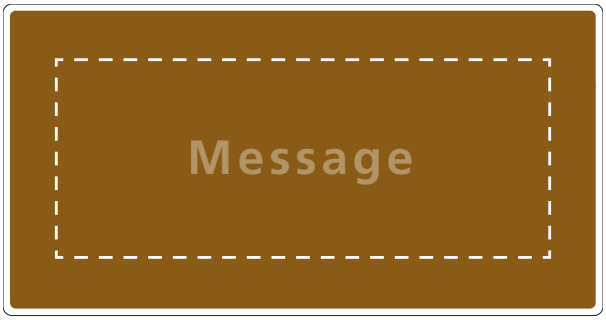
Correct: Adequate space around graphics

Incorrect: Graphics too close to edge

Header Bar
The function of the header bar is to increase the target value of a sign and to act as a "visual container" for the graphics below. For signs along the Appalachian National Scenic Trail the standard header color is black. In order to be compatible with other existing sign standards, signs in U.S. Forest Service (USFS) jurisdictions may use an ivory header.

Correct: Standard black header bar

Correct: Alternate USFS-style header bar



Incorrect: No header bar

Line Length
A single message may be placed on two or three lines in order to maintain the proportions of the sign panel. Try to avoid extreme differences in line length. Line length can sometimes be reduced by using commonly recognized abbreviations, such as Blvd for Boulevard or Mt for Mount. Proper names, however, should always be written out in full. Overall, when it comes to line length, an appropriate layout will take into account visual balance, legibility, and communicative impact.

Uppercase and Lowercase Legends
For optimum readability, most of the sign types in this manual use upper/lower case text (all lower case except for the initial capital). Studies have shown that upper/

lower case legends are read and understood more quickly than all caps. With upper/lower case, words form unique shapes and patterns that are more recognizable, whereas all caps create uniform blocks of text that must be read letter by letter. There is an exception for highly common words, such as STOP or CAUTION, which are quickly recognizable because of a lifetime of conditioning.

Correct: Intial capital letter and lower case

Incorrect: All uppercase

Letter, Word, and Line Spacing

Text that is viewed from a distance must have more open letter spacing (or tracking) than text that is viewed at close proximity. If letters are too tight, they can run together. Because most signage is viewed from a distance, spacing between letters and between words should be widened slightly for optimum readability. Spacing should not be too open though, otherwise words may be hard to distinguish.

Correct spacing

Incorrect: Spacing too tight

Incorrect: Spacing too open

The space between lines is called line spacing (or kerning). Line spacing that is too tight or too open is difficult to read. For multiple-line messages that are intended to be read as a group, the space between the lines of a multiple-line message should be tighter than the space between two different messages.

Correct: More space between two messages

Incorrect: Equal space between all lines

Legend Size and Viewing Distance

The appropriate size of letter is based on the required viewing distance. For that reason, some of the sign types in this manual are shown in more than one size.

See Viewing Distance Guide (*Figure 2*) for more information on letter sizing.

Figure 2 **Viewing Distance Guide**

The chart below identifies the appropriate letter height for a legend based on the distance at which a sign will be viewed. In compliance with Federal Highway Administration Standards, letter sizes are calculated for people with at least 20/40 vision.

The right column shows that the smaller type sizes are used for pedestrian signs, while signs read by vehicular traffic have larger type.

While most messaging in this manual is upper/lower case, the type size for a sign is calculated by the height of the initial capital letter (typically the letter M).

Viewing Distance (feet)	Capital letter height (inches)	Application
0-20	0.75	Pedestrian
21-27	1	Pedestrian
28-41	1.5	Pedestrian
42-45	2	Pedestrian
56-83	3	Pedestrian
84-111	4	Pedestrian

MPH	Viewing Distance (feet)	Capital letter height (inches)	Application
0-25	90-110	4	Vehicular
26-35	135-155	6	Vehicular
36-50	180-220	9	Vehicular
51-65	250-300	12	Vehicular

When measuring the size of a capital letter form, only use flat letters, such as M. Round letters—CGJOQSU—will not give an accurate measurement because they're drawn to sit slightly above and below the height line and base line, respectively (see right).

Color and Contrast

One of the primary factors in obtaining a high target value is color—specifically high contrast of color. To maximize target value, a sign should have high contrast between the graphics and sign background. A sign panel with a solid, dark background and white (or light) text is more legible than a sign with a light background and black (or dark) text.

Many signs inherit their color standards from existing sign color systems, such as the *Manual on Uniform Traffic Control Devices* (MUTCD) for traffic-related signs and *Occupational Safety and Health Administration Standards* (OSHA) for safety-related signs. Almost all viewers are familiar with the meaning of these color combinations: red and white indicates danger; yellow and black indicates caution, etc.

Placement and Mounting

Sign mounting methods have been standardized as much as possible to create visual uniformity. There are also options for retrofitting existing structures. Mounting heights and locations are determined for optimum readability.

The following are general guidelines for placing signs depending on whether they will be viewed by pedestrians or vehicular traffic. For more detailed information on sign placement on roadways refer to the MUTCD.

Vehicular Traffic

Signs must be within a driver's immediate "cone of vision." Drivers cannot be expected to turn their heads to read a message. If, under special circumstances, a sign must be placed more than 40 feet off the road and outside the normal cone of vision, the sign may need to be scaled up in size to increase readability.

– Signs should always be perpendicular to the approaching viewer, never parallel to traffic.

– Signs should be placed on the right-hand side of the roadway or driveway. Drivers (in the United States) are not conditioned to look to the left for information.

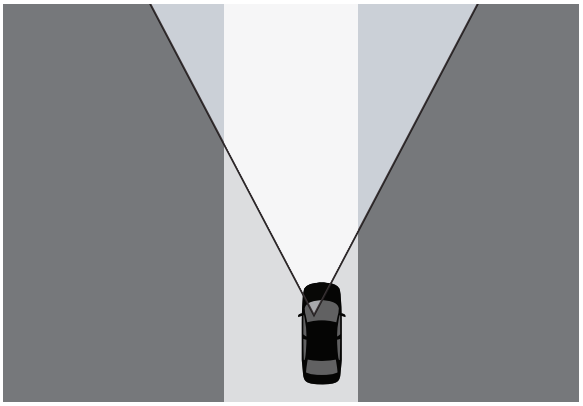
– An exception can be made to this rule for double-sided main identification signs that are mounted parallel to a facility entrance or driveway.

– Signs that prompt a reaction, such as "Take Next Right," must be placed well in advance of an intersection so as to afford drivers a safe amount of time to execute a maneuver, especially when there are multiple lanes.

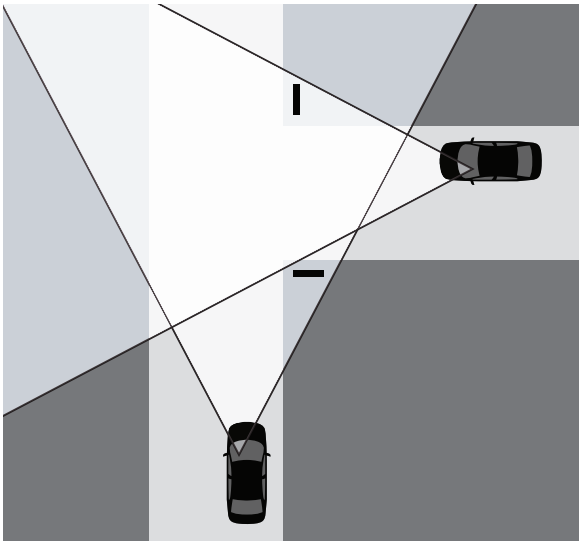
– Mounting height is measured from the ground to the bottom edge of the sign panel. For vehicular signage, the road is considered ground level.

– If multiple signs are required along a road, they must be spaced out so as to allow a driver to read and react to one sign before the next one is presented. The distance between signs will be determined by the speed of traffic. See chart below or refer to the MUTCD (Section 2C.05) for more details.

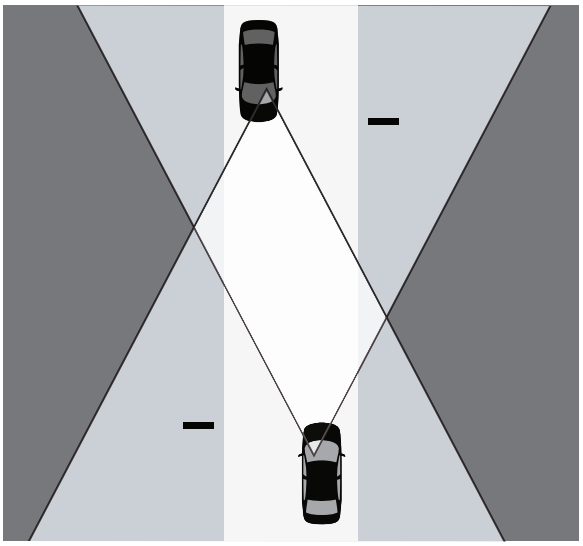
Speed (mph)	Distance Between Signs
Pedestrian	25 feet
25	100 feet
30	125 feet
35	150 feet
40	200 feet
45	250 feet
50	300 feet
55, 2-lane	350 feet
55, multi-lane	500 feet



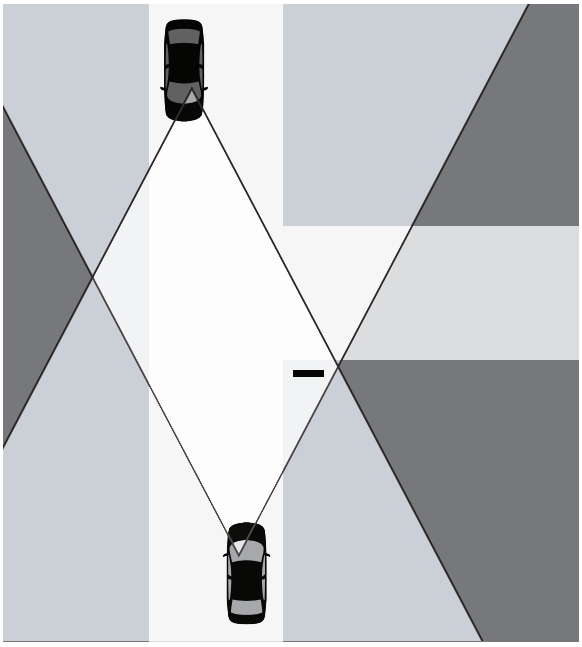
Driver's cone of vision



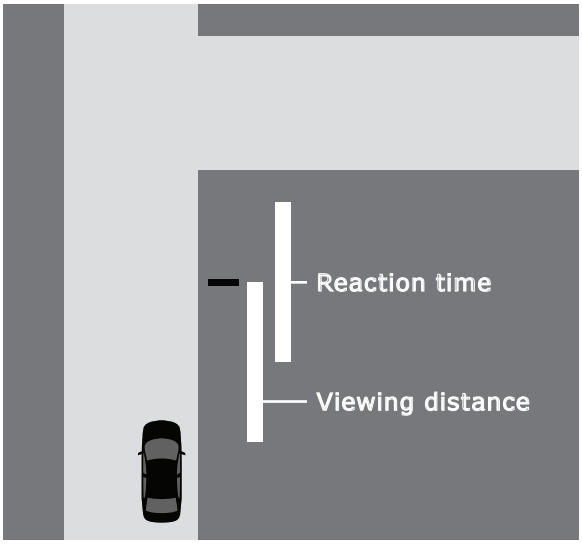
Place signs perpendicular to viewer



Place signs on right-hand side of roadway



Double-sided identification sign exception



Place signs well in advance of required action

Pedestrians

Pedestrian signs should be mounted at eye level. The average eye level is 5'-6" standing and 4'-6" sitting. Signs should be mounted on center at 60" to be compliant with the Americans with Disabilities Act (ADA) Standards for Accessible Design. Signs intended to be viewed from a long distance will be mounted higher than a sign in the immediate foreground.

If multiple signs are required along a path, they must be spaced out so as to allow visitors to read and react to one sign before the next one is presented. An effective distance between signs for high readability and low sign clutter is generally 25'. Signs should not be placed side-by-side.

Materials

Section 6 of this manual has recommendations on materials and methods for fabrication for each sign type. The materials included have been specified based on longevity, aesthetics, cost, availability, and maintenance requirements.

Maintenance

The regular maintenance of signs is an integral part of comprehensive sign program management. This includes preventative measures, cleaning, landscaping, repairs, and replacement. The location plan developed during the planning phase of a project is also helpful for maintenance purposes as it acts as both a record and a checklist.

Cleanup

To clean signage use recommended methods outlined here. These products can be used on all the recommended fabrication methods. Start with the least aggressive methods available (soap and water) and move down the list. Surfaces may be cleaned with:

– Mild soap and warm water

– Non-abrasive cloth, such as microfiber

– A soft eraser, such as a pink rubber eraser

– Ammonia-free, bleach-free foaming glass cleaner, such as Sprayway (or equivalent)

– Ammonia-free, bleach-free multi-purpose cleaner

– Rubbing alcohol

– Ammonia-free, bleach-free, water-based graffiti remover

– Goo Gone (or equivalent)

Prevention

After cleaning surfaces to remove any dirt, oil, or grease—cover the entire sign with a coat of wax. The easiest way to do this is to use a spray wax like those typically used for wood finishes (e.g. Pledge or equivalent). Pro tip: If using Pledge—the original, lemon-scented formula is most effective. This wax coating should be applied at least once a year to build up a protective barrier—ideally twice a year. This protective barrier makes it easier to remove any graffiti and will extend the life of your sign significantly.

What Not to Use

Do not use any cleaners that contain ammonia, acetone, lacquer or paint thinner, or alkaline cleaners. Never scrub with abrasive materials.

Removing Graffiti

Graffiti and sticker residue can be removed with household cleaners, rubbing alcohol, or Goo Gone (or equivalent). When using Goo Gone, follow with mild soap and water, and finish with a protective layer of wax.

Section 3: Planning & Documentation

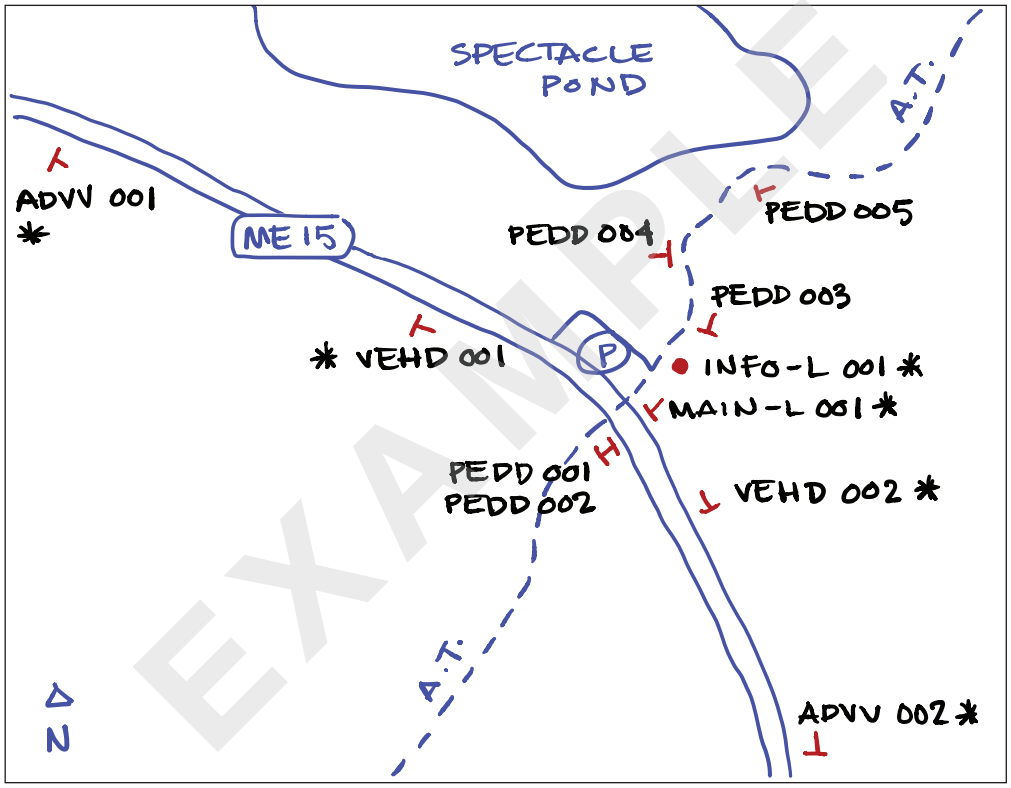
Introduction

This section offers instruction to contractors and/or sign coordinators on procedures for developing a Sign Plan for a site. This includes completing a Sign Assessment, developing a Location Plan, and a Message Schedule. Together these three documents comprise the Sign Plan.

Sign Assessment

The purpose of a Sign Assessment is to take inventory of existing signs and make recommendations for signage that needs to be replaced, removed, or added. The assessment is comprised of a site map, a written evaluation, and a photo log. The site map should be at a scale large enough to accurately note locations of existing and recommended signs. See the sample Sign Assessment (*Figure 3.1, 3.2, 3.3* and *3.4*) for more detail.

Figure 3.1 **Sign Assessment: On-Site Sketch**

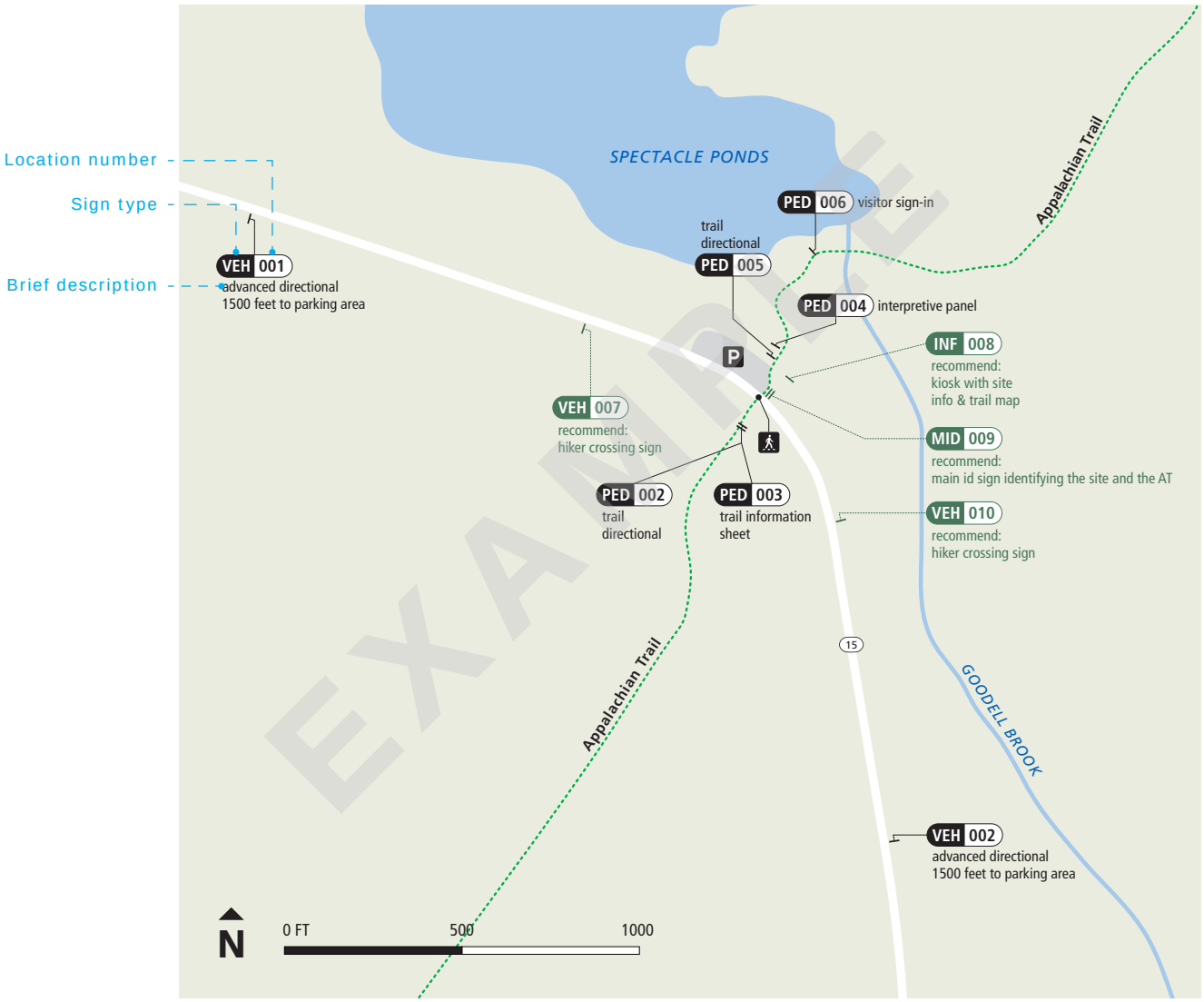


This site map sketch can be rough. It will be translated to a more formal map in the next step. It should include some landmarks such as the A.T., roads, parking lots, bodies of water, etc. Indicate which direction is north.

Note the location of all existing signs and recommended signs—and be sure to differentiate between the two. Each sign should have a three-digit number that will accompany the 4-letter sign type code. Begin each sign type with 001 and add sequentially.

When marking locations of signs, use a T or an H symbol to indicate the orientation of a single- or double-sided panel.

Figure 3.2 **Sign Assessment: Site Map**



Translate the site map sketch to a formal digital map so that it is a live document and can be edited to reflect current conditions.

Include a brief description of the sign message and add a scale.

Figure 3.3 **Sign Assessment: Written Evaluation**

Parking lot
The gravel parking lot off ME Route 15 can accommodate 10-15 cars. There are advanced directionals for traffic traveling in both directions. The parking lot is maintained by the town of Monson. There are no parking control signs in the lot.

The trail
The trail to the north of the highway is owned by the Maine Department of Inland Fisheries & Wildlife; the trail to the south of the highway is owned by the National Park Service. To the north is the Hundred Mile Wilderness; to the south the trail is relatively flatter with a 3-mile section before the next road. This section is maintained by the Maine Appalachian Trail Club. The club oversees 267 miles of the Appalachian Trail—from ME Hwy 26 in Grafton Notch to Mount Katahdin.

Trail users
There are approximately 2,000 northbound thru-hikers annually from this point north to Mt. Katahdin. This section is also used heavily by section hikers and weekend backpackers who are hiking to Katahdin, Iron Works Road, or Jo Mary Road. There are also a number of larger groups on this section of the trail (e.g. school and camp groups). This is one of the most popular section hikes in Maine because of its length, as well as its pristine scenic reputation.

Signage
There are two advanced directionals located 1500 feet from the parking lot entrance on ME Route 15 in either direction. Both signs are highly visible and give plenty of advanced warning to drivers. Although they identify the parking area, they do not warn that hikers are crossing the highway. There is no signage indicating the pedestrian crossing. There is an interpretive sign located in the parking lot which looks quite new as of this assessment in 2017. There is a trail directional located at the northbound trailhead which is visible from the parking area. There is a trail directional on the southbound trail which is not visible from the road. It is accompanied by a trail information sheet with extensive seasonal information.

EXAMPLE

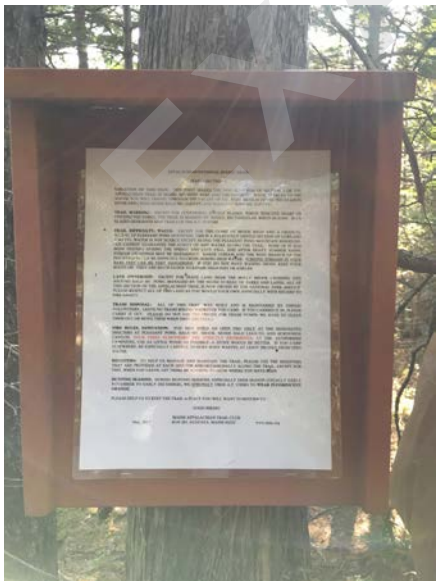
The written evaluation should focus mainly on four main topics: the parking lot, the trail, who the trail users are, and the condition of existing signage (if any). To begin an assessment, visit the site to evaluate the following:

– Are the existing signs in good condition?
– Are the signs in compliance with the standards outlined in this manual?
– Are there any signs that are no longer necessary or relevant?
– Are there any signs missing?

Figure 3.4 **Sign Assessment: Photo Log**

VEH-001 Advanced Directional
Existing Advanced Vehicular Directional sign located 1500 feet before the parking area and pedestrian crossing on ME Route 15 southbound.

PED-002 Trail Directional
Existing Pedestrian Directional sign located just beyond the entrance of the trail south of ME Route 15.



PED-003 Trail Info Sheet
Existing laminate poster with extensive seasonal trail information.

PED-004 Trail Directional
Existing Pedestrian Directional sign located at the entrance of the trail south of ME Route 15.

EXAMPLE

Location Plan

The Location Plan is a visual record that identifies the placement of all signs on a site map (see *Figure 4.1* and *4.2*). This plan can be revised and updated as signs are removed and/or added.

The site map will be similar to the one developed during the Sign Assessment, but now the focus is on new signage.

The scale of the map shown below is a convenient and reasonable size for fairly accurate sign placement.

Each sign type is color-coded for easy recognition. Existing signs are shown in gray. There is a key (shown on the following page) which accompanies the Location Plan site map and which acts as a quick reference or a summary of all signage.

Figure 4.1 **Location Plan: Site Map**

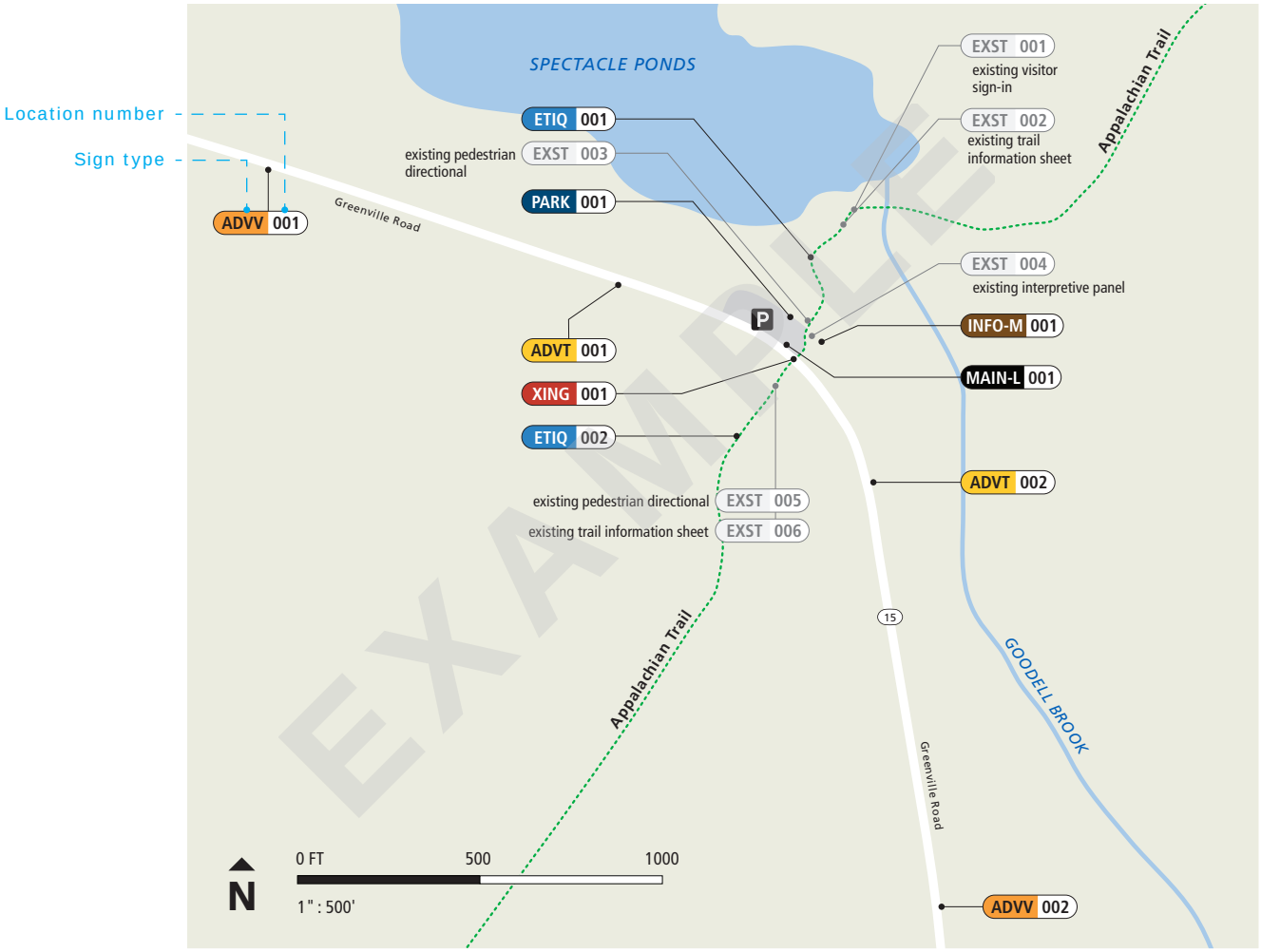


Figure 4.2 **Location Plan: Key**

Sign type		Qty	Notes
ADVV 000	Advanced Directional*	2	
ADVT 000	Advanced Trail Crossing*	2	
XING 000	Trail Crossing Marker*	2	One bollard on each side of the road
MAIN 000	Main Identification	1	Large
VEHD 000	Vehicular Directional*	0	Not required
PARK 000	Parking Control	5	Exact locations TBD
PEDD 000	Pedestrian Directional	0	Existing
INFO 000	Information Kiosk	1	Medium; new structure
ETIQ 000	Etiquette Panel	2	
EXST 000	Existing Sign	—	

*These sign types may require DOT permitting and/or approval.

EXAMPLE

Message Schedule

All signs are numbered and keyed to a corresponding Message Schedule (see *Figure 5*). The schedule is a written inventory of sign type, user type (e.g. pedestrian or vehicular), message, size, mounting type, and location.

Figure 5 **Message Schedule**

Sign code	Sign type	User	Message	Location	Size	Mounting
ADVV-001	Advanced Directional	Vehicular	(left) Hundred Mile Wilderness Parking Area; (icon) Parking; (icon) Hiker; 1500 feet	ME Route 15/Greenville Rd (southbound) 1500 feet before parking lot entrance	68" x 45"	In-ground, new posts
ADVT-001	Advanced Trail Crossing	Vehicular	Trail Crossing (icon) Hiker 300 feet	ME Route 15/Greenville Rd (southbound) 300 feet before trail crossing	18" x 40"	In-ground, new post
XING-001	Trail Crossing Marker	Vehicular Pedestrian	(icon) Hiker – oriented for vehicles; White blaze oriented for pedestrians	ME Route 15/Greenville Rd at AT crossing; one marker on either side of the road.	6" x 6"	In-ground, new post
MAIN-L-001	Main ID – Large	Vehicular Pedestrian	Hundred Mile Wilderness Club: Maine Appalachian Trail Club; Partners: NPS, ATC, Maine Dept of Inland Fisheries & Wildlife, City of Monson	ME Route 15/Greenville Rd at entrance to parking lot	34" x 68"	Surface mount
INFO-S-001	Information Kiosk – Small	Pedestrian	AT overview info; local site info; safety & caution	In parking area near interpretive sign	48" x 48"	Existing
PARK-001	Parking Control	Vehicular	(See Sign Type Menu page 6.1 for messaging) Example #2 "Parking/Hiker Parking Only" (x1), #4 "Parking/In Designated Areas Only" (x2), #6 "Parking/On Paved Roads Only" with no arrows (x2)	Throughout parking area as needed (exactly locations TBD)	Varies	In ground, new posts
ETIQ-001	Etiquette Marker	Pedestrian	(icons) Campfires in designated areas, keep pets leashed, no camping, no littering, no collecting, no bicycles, no drones, no horses	100–300 feet down the trail from trailhead (trail north)	4.25" x 22.25"	In-ground, new post

EXAMPLE

Section 4: Design Standards

Introduction

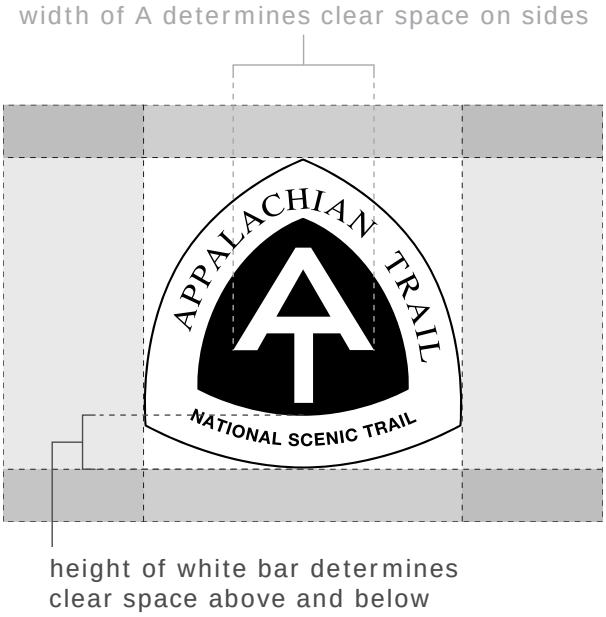
This section contains information on visual standards and graphic specifications, including details in the use of logos, color, typeface, etc. Consistent use of these graphics will help to create a cohesive sign family.

Logo

The Appalachian National Scenic Trail logo, sometimes referred to as the pregnant triangle, should appear on all trail signage from Main Identification (MAIN) signs to the Etiquette Markers (ETIQ). For exact placement and scale see individual sign types.

The logo is always displayed in black and white and should always have adequate clear space around it.

Other logos from partner organizations and local trail clubs can be displayed on Main Identification (MAIN) signs and Information Kiosks (INFO). These logos must also be displayed in black and white or grayscale.



Leave adequate white space

Example of partner logos

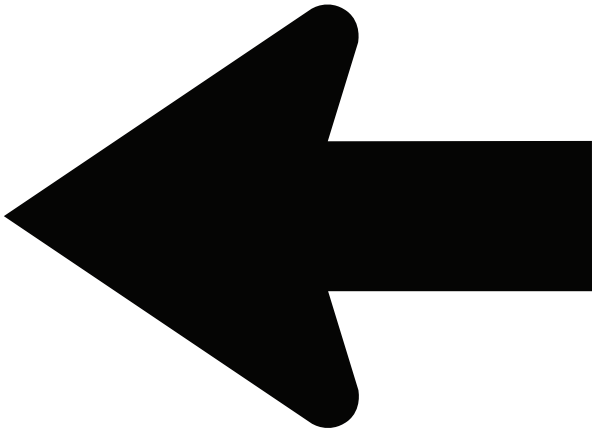
Black & white

Grayscale

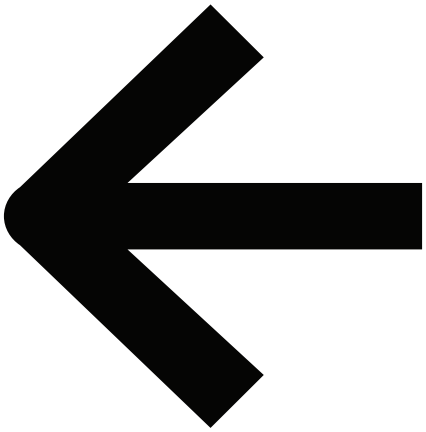
Arrows

There are two arrows used on directional signage. One is used on signage on all major roadways anywhere outside park boundaries, such as Advanced Vehicular Directional signs. This arrow is compatible with the *Manual on Uniform Traffic Control Devices* (MUTCD).

The other arrow is used on vehicular and pedestrian directionals within park boundaries.



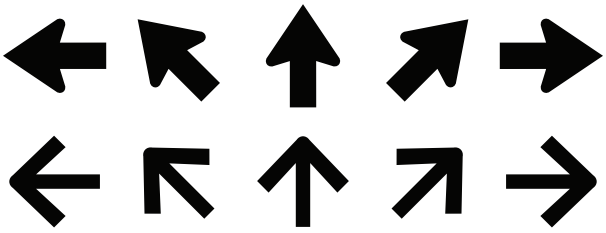
Used on roadways outside the park boundary



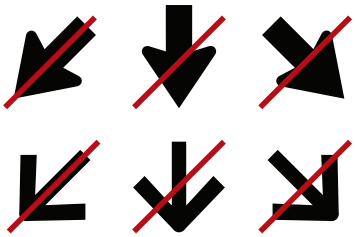
Used on all signage within the park boundary

On directional signage only use arrows that point left, right, straight ahead, or straight at a 45° angle. Never use an arrow that points down as it is confusing to visitors. Everyone interprets them differently and, generally speaking, visitors do not usually need to know where they have come from (destinations behind them).

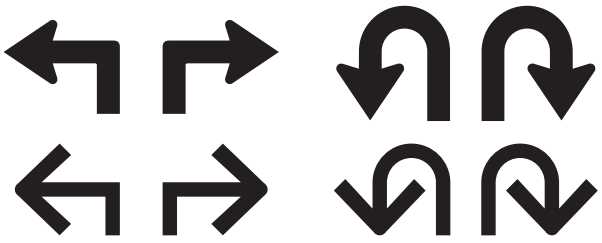
If you are faced with a situation where you need to use an arrow that faces down, it is always better to add another panel that is either on the back of or perpendicular to the first. Moving that information to a second panel will usually allow you to use a left, right, or straight (up) arrow. There is a set of arrows (shown below in the third line) for use in complex situations (e.g. when a destination is around a corner or when a visitor must turn around). These should only be used when the standards arrows can not communicate a message clearly.



Correct



Incorrect



Used only in rare situations when standard arrows aren't clear

Color

There are two standard color palettes used throughout this manual: the primary palette and the secondary (see *Figure 6*). It is important to match these color standards exactly as they correspond with existing MUTCD traffic control standards, OSHA safety standards, and accessibility standards.

Figure 6 **Primary Color Palette**

This is the standard primary background color at all sites.

Brown
PMS 1615 C
CMYK 36 60 100 26
Vinyl Standard FHWY Admin brown

This is the alternate primary background color only at USFS sites.

FHWA Brown
PMS 469 C
CMYK 21 70 92 70
Vinyl FHWA brown
Paint 20059

Secondary Color Palette

*or equivalent such as Avery or 3M

Used for headers, footers, and text.

Black
PMS Black 6 C
CMYK 100 100 100 100
Vinyl Oracal 951-070*

Used on traffic signage for warning or road hazard messaging.

Caution Yellow
PMS 124 CV
CMYK 6 31 100 0
Vinyl Oracal 951-204*

Used to indicate accessibility.

ADA Blue
PMS 2945
CMYK 100 73 20 7
Vinyl Oracal 951-573*

Used on traffic signage for prohibitive and danger messaging.

Regulatory Red
PMS 187 C
CMYK 23 100 88 15
Vinyl Oracal 951-334*

Used on parking signage.

Parking Green
PMS 7489 C
CMYK 62 14 91 0
Vinyl Oracal 951-602*

Used for headers with FHWA brown at USFS sites.

Neutral
PMS 4535 30%
CMYK 5 5 12 0
Vinyl Oracal 951-816*

Typography

Two typefaces are used on the signs in this manual: Highway Gothic and Frutiger. These typefaces were selected because they are highly legible, contemporary, and readily available to contractors and/or sign coordinators.

Following is a full upper/lower case display for both typefaces in different weights (see *Figure 7*). Each typeface and weight is intended for different applications, but the shared typographic system ensure a cohesive look. Size and appropriate spacing has been determined for each sign type based on function and viewing distance. See individual sign types for details.

Figure 7 **Typefaces**

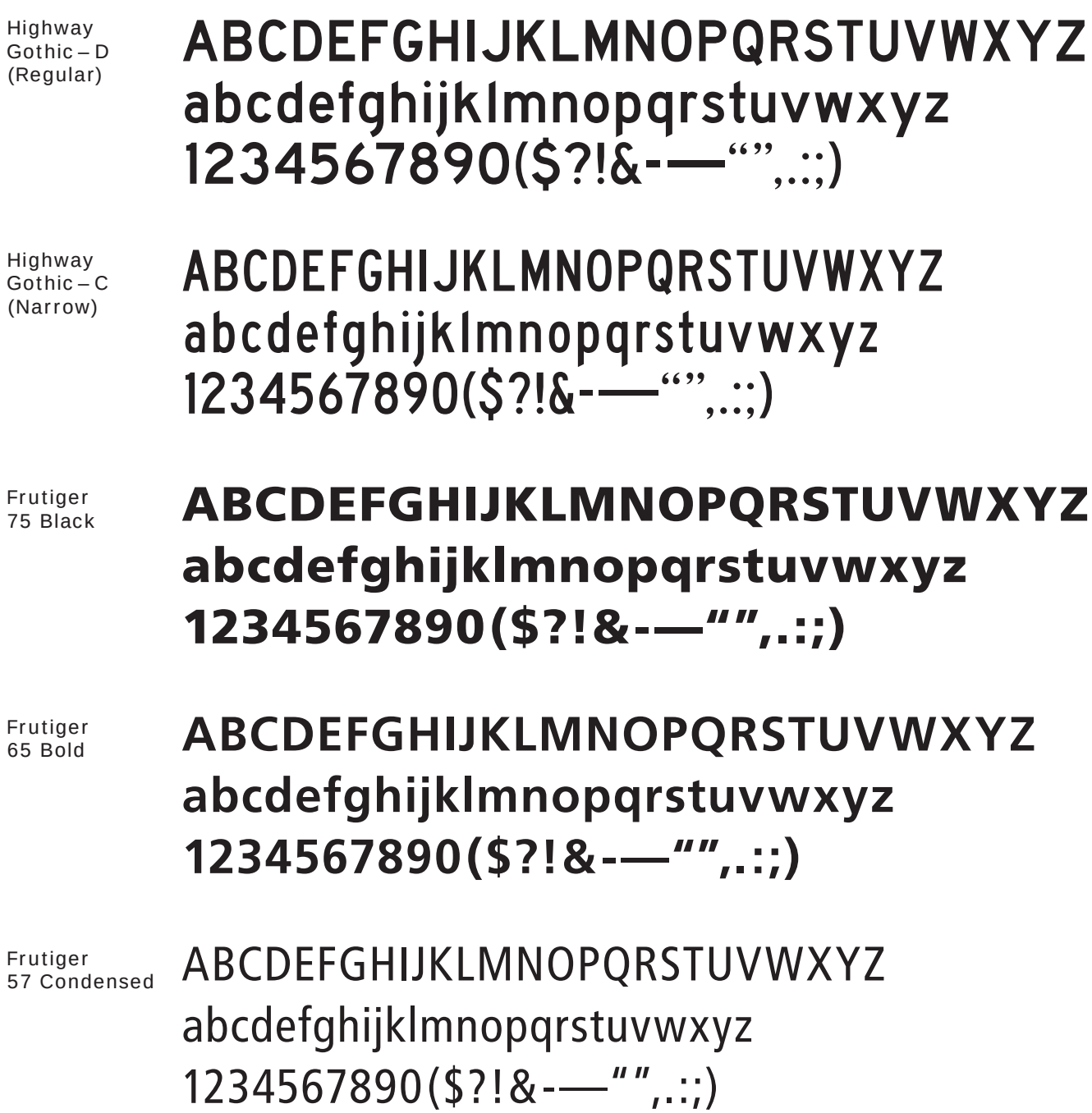


Figure 8 **Symbols**

Other Symbols, cont'd

Privy

Campfires in designated areas

Parking

Restroom

Prohibitive Symbols

No alcohol

No off roading

No all terrain vehicles

No parking

No camping

No pets

No graffiti

No campfires

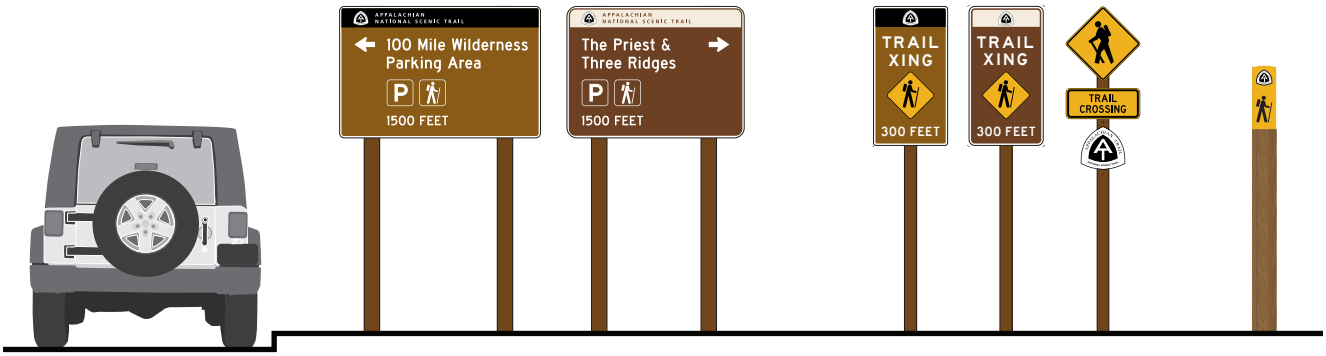
Section 5: Sign Types

Introduction

This section includes graphic details for all sign types. These first pages are an overview of the complete sign family.

The layouts shown in this section are available as templates through the NPS Appalachian National Scenic Trail Office.

Figure 10 **Sign Family**

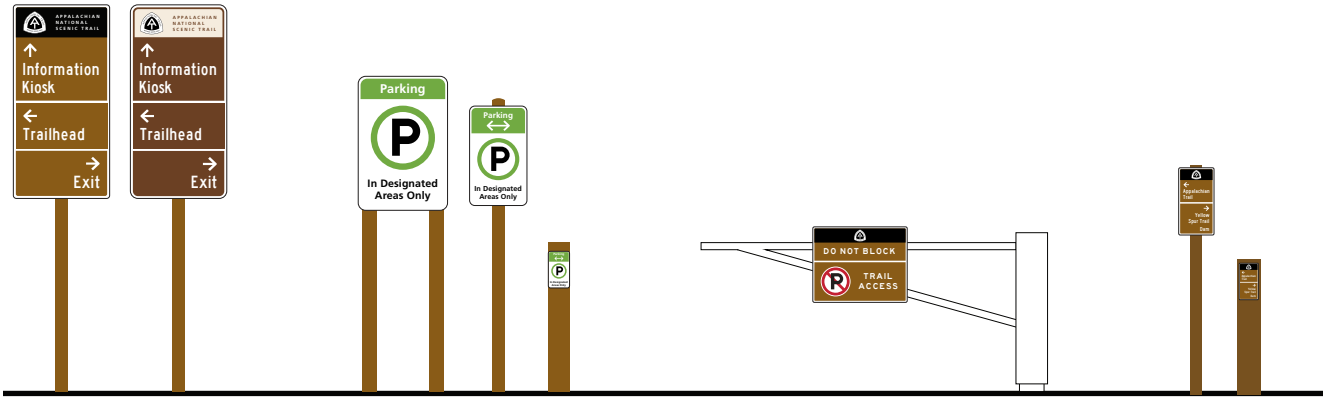


ADVV
Advanced Vehicular Directional

ADVT
Advanced Trail Crossing

XING
Trail Crossing Marker

MAIN
Main Identification



VEHD
Vehicular Directional

PARK
Parking Control

PARK-G
Parking Control

PEDD
Pedestrian Directional

INFO-L
Information Kiosk Large

INFO-M
Information Kiosk Medium

INFO-S
Information Kiosk Small (one-, two-, or three-post)

ETIQ
Etiquette Marker

ADVV Advanced Directional

Advanced Directional signs are intended to give motorists advanced warning of upcoming turns, exits, and amenities.

These signs are generally used outside the park boundary on approach roadways. They can be used within the park boundary, though it is not that common. Within the park boundary, it is more common to use the Vehicular Directional sign type.

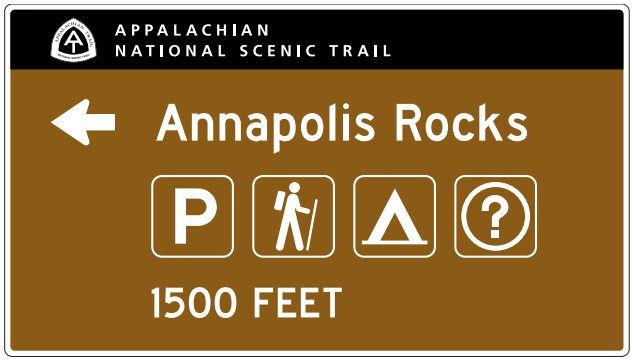
Consult state supplements to the *Manual for Uniform Traffic Control Devices* (MUTCD) for guidelines on placement and fabrication specifications. Find state supplements at https://mutcd.fhwa.dot.gov/resources/state_info/index.htm.

These signs may need to be reviewed and approved by city and state Departments of Transportation, and may require a permit.

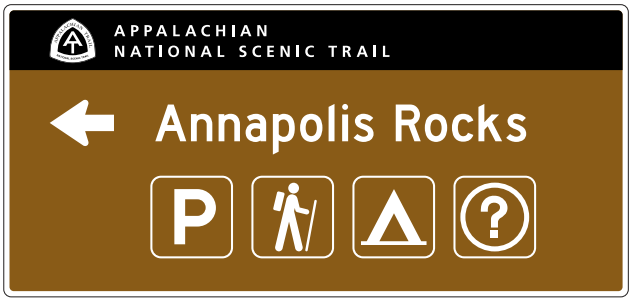
If more than 4 symbols are required, the symbols should be divided onto multiple panels and placed sequentially along the roadway at an appropriate distance (see page 2.7 for an overview or reference the MUTCD Section 2C.05 for more detail).

There are two color schemes shown. The brown sign with the black header is the standard and will be used at all NPS and partner sites. The brown sign with the ivory header is an alternate USFS compatible style that may be used only at USFS sites. See page 4.3 for exact color specifications.

Scale: 3/8" = 1'- 0"
Sign type: ADVV



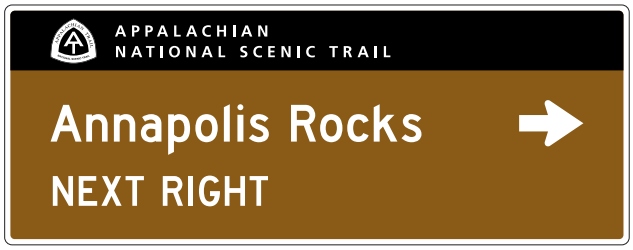
Example 1
With symbols (4 maximum) and mileage



Example 2
With symbols only (4 maximum)

Example 3
With mileage only

Example 4
With site name & arrow only



Example 5
With secondary message

Example 6
With exit number

Example 7
Longer message stacked when width of sign is constrained

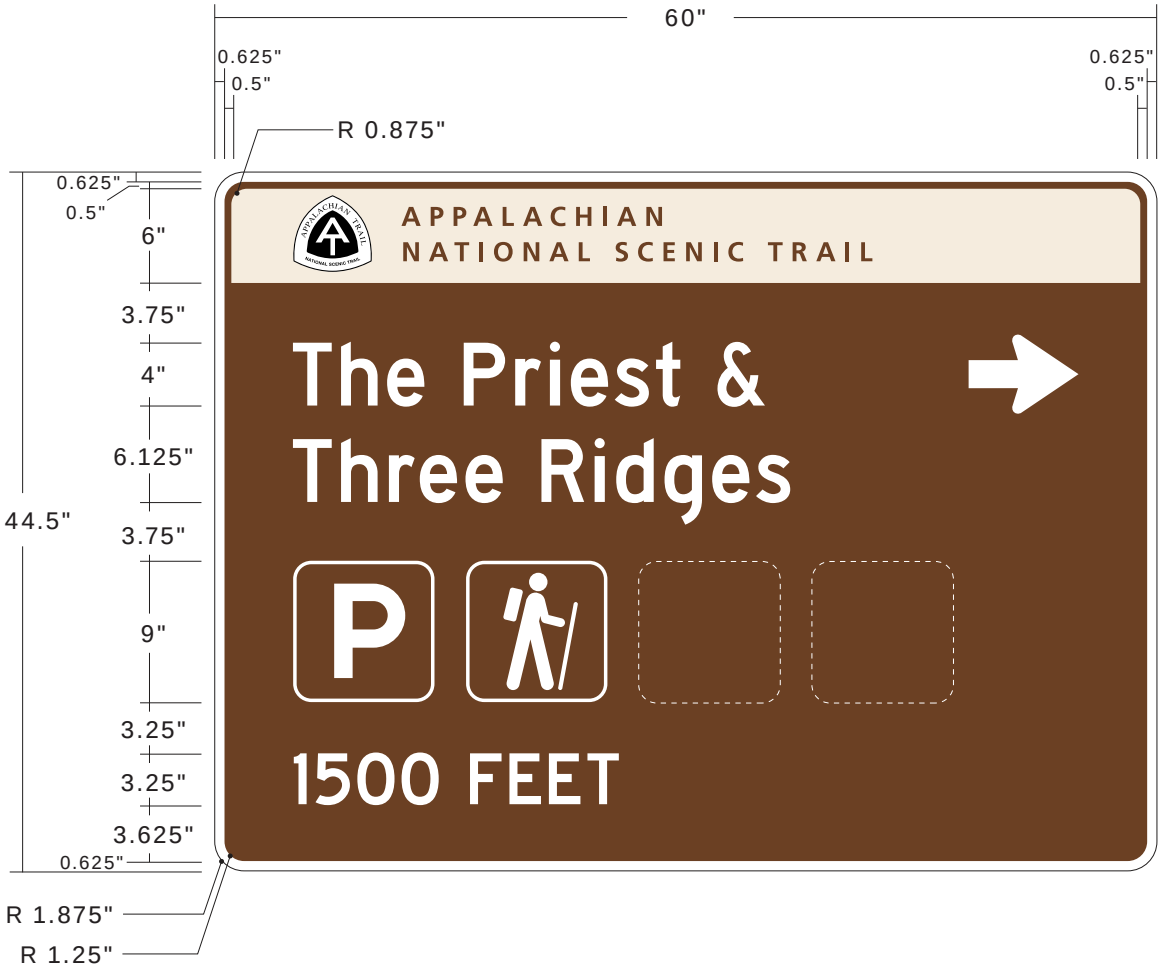
Example 8
Alternate U.S. Forest Service compatible styling

Standard layout

1. Width may vary depending on length of legend. Minimum width is 60"; maximum width is 72".
2. Maximum of 5-lines is recommended for glance legibility.

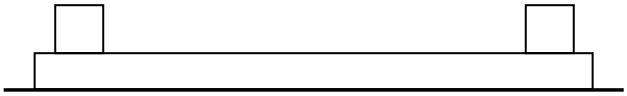
Scale: 1" = 1'- 0"
Sign type: ADVV

Alternate U.S. Forest Service compatible styling

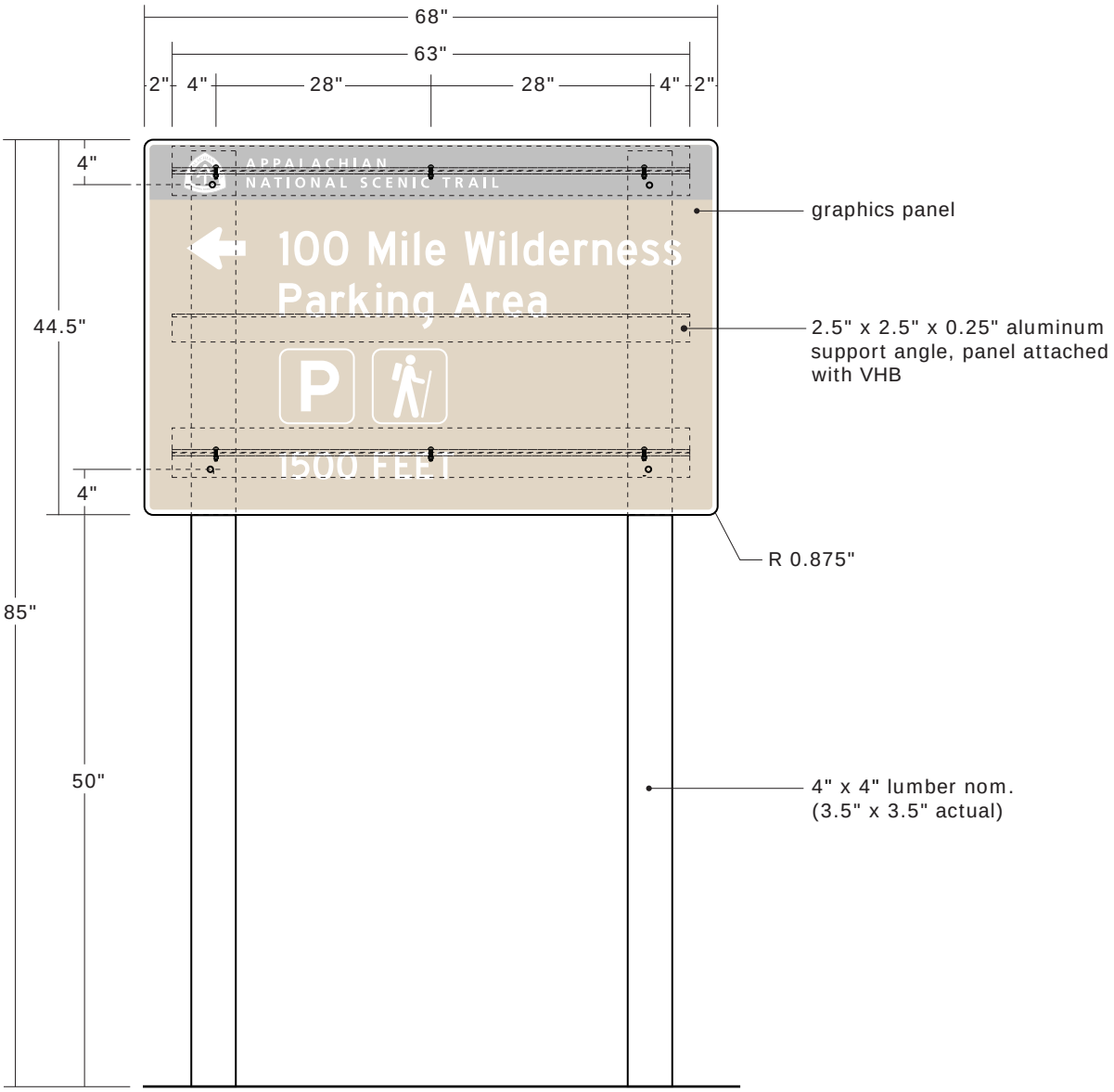


1. Width may vary depending on length of legend. Minimum width is 60" (shown); maximum width is 72".
2. Maximum of 5-lines is recommended for glance legibility.

Scale: 1" = 1'- 0"
Sign type: ADVV

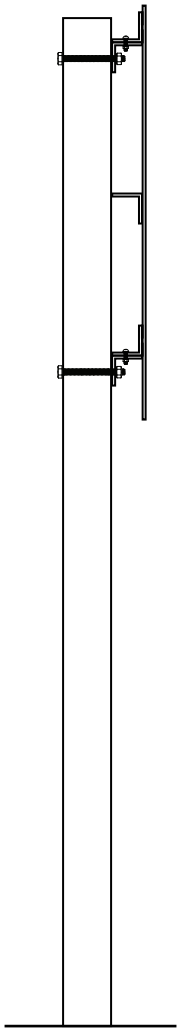


Plan View
0.75" = 1' - 0"

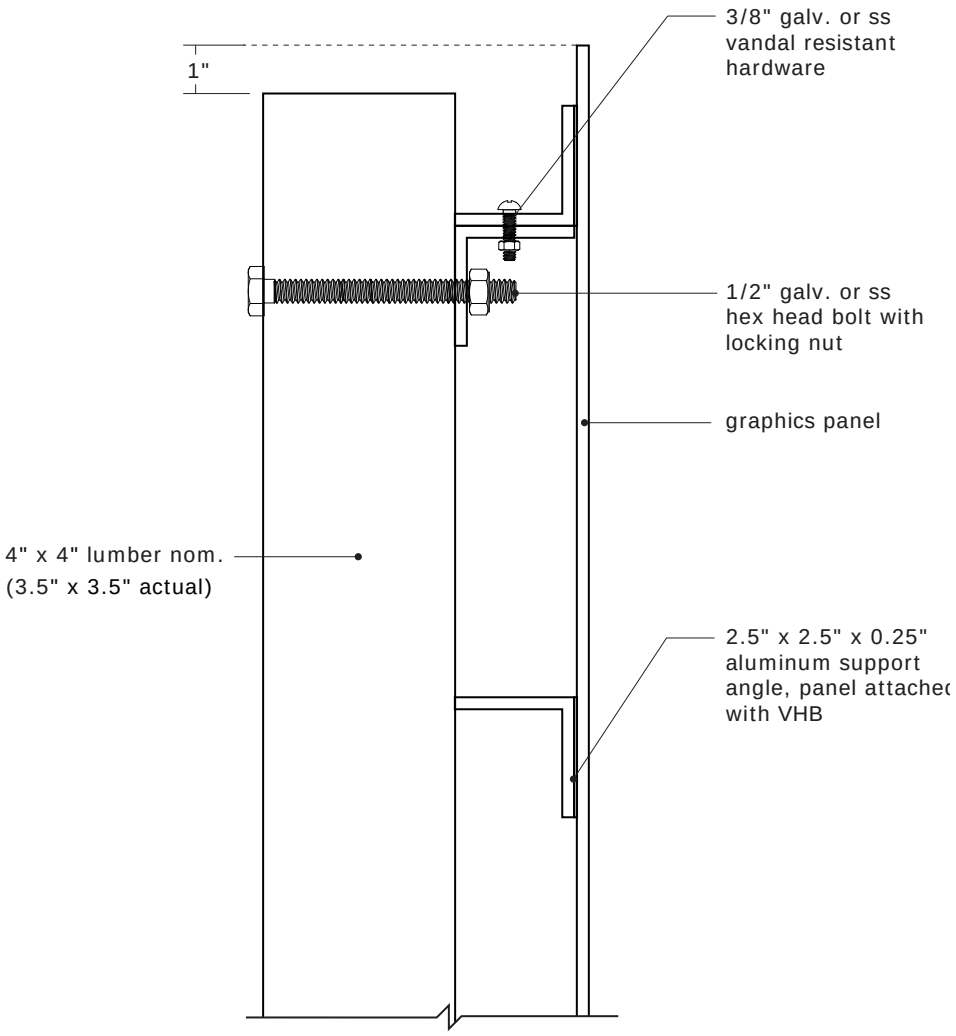


Front View
0.75" = 1' - 0"

Scale: As shown
Sign type: ADVV



Side View
0.75" = 1' - 0"



Connection Detail
3" = 1' - 0"

* Check with federal, state, and local regulations for breakaway requirements. A breakaway post is designed to break away if struck thereby lessening the impact and damage to a vehicle and minimizing injury to occupants.

Scale: As shown
Sign type: ADVV

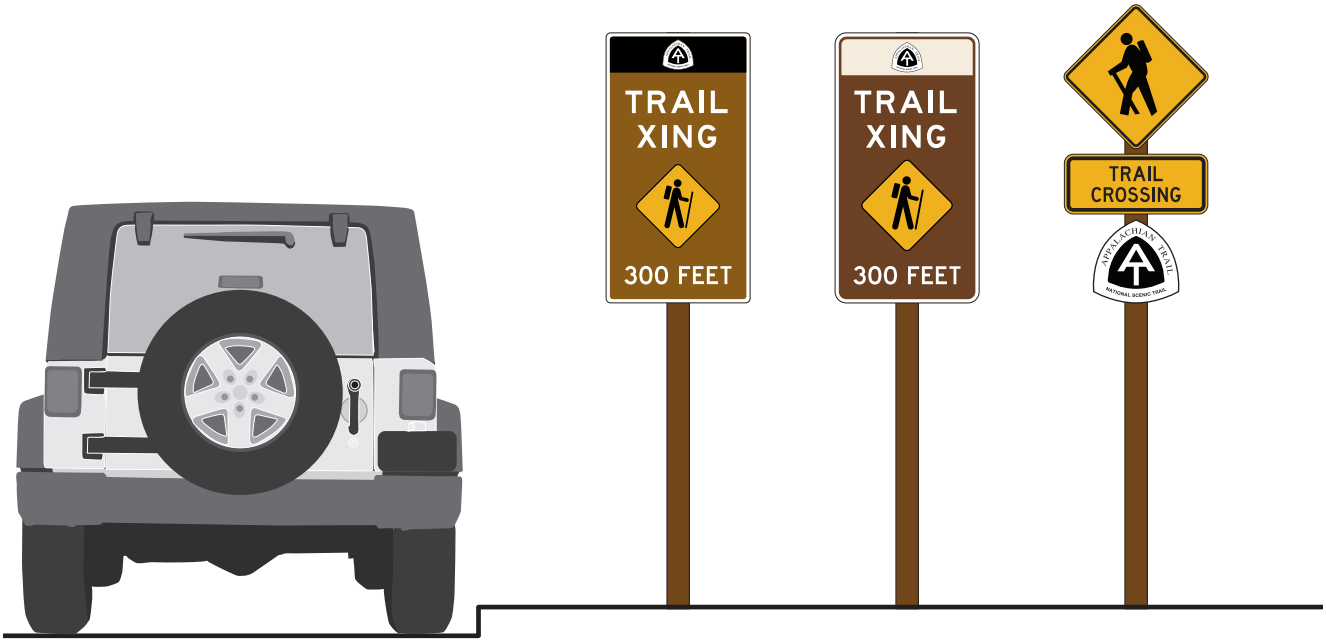
ADVT Advanced Trail Crossing

Advanced Trail Crossing signs are placed on roadways prior to trail crossings to alert motorists to pedestrian traffic.

Consult state supplements to the *Manual for Uniform Traffic Control Devices* (MUTCD) for guidelines on placement and fabrication specifications. Find state supplements at https://mutcd.fhwa.dot.gov/resources/state_info/index.htm.

The vertical design allows for use in narrow right-of-ways (ROWs). However, these signs need to be reviewed and approved by city and state Departments of Transportation, and may require a permit.

There are two color schemes shown. The brown sign with the black header is the standard and will be used at all NPS and partner sites. The brown sign with the ivory header is an alternate USFS compatible style that may be used only at USFS sites. See page 4.3 for exact color specifications.



Scale: 3/8" = 1'- 0"
Sign type: ADVT

Example 1
With distance

Example 2
With distance (2-line)

Example 3
No distance

Example 4
Alternate U.S. Forest Service compatible styling

Example 5
Alternate MUTCD style

Standard layout

Variations

2-line message

No message

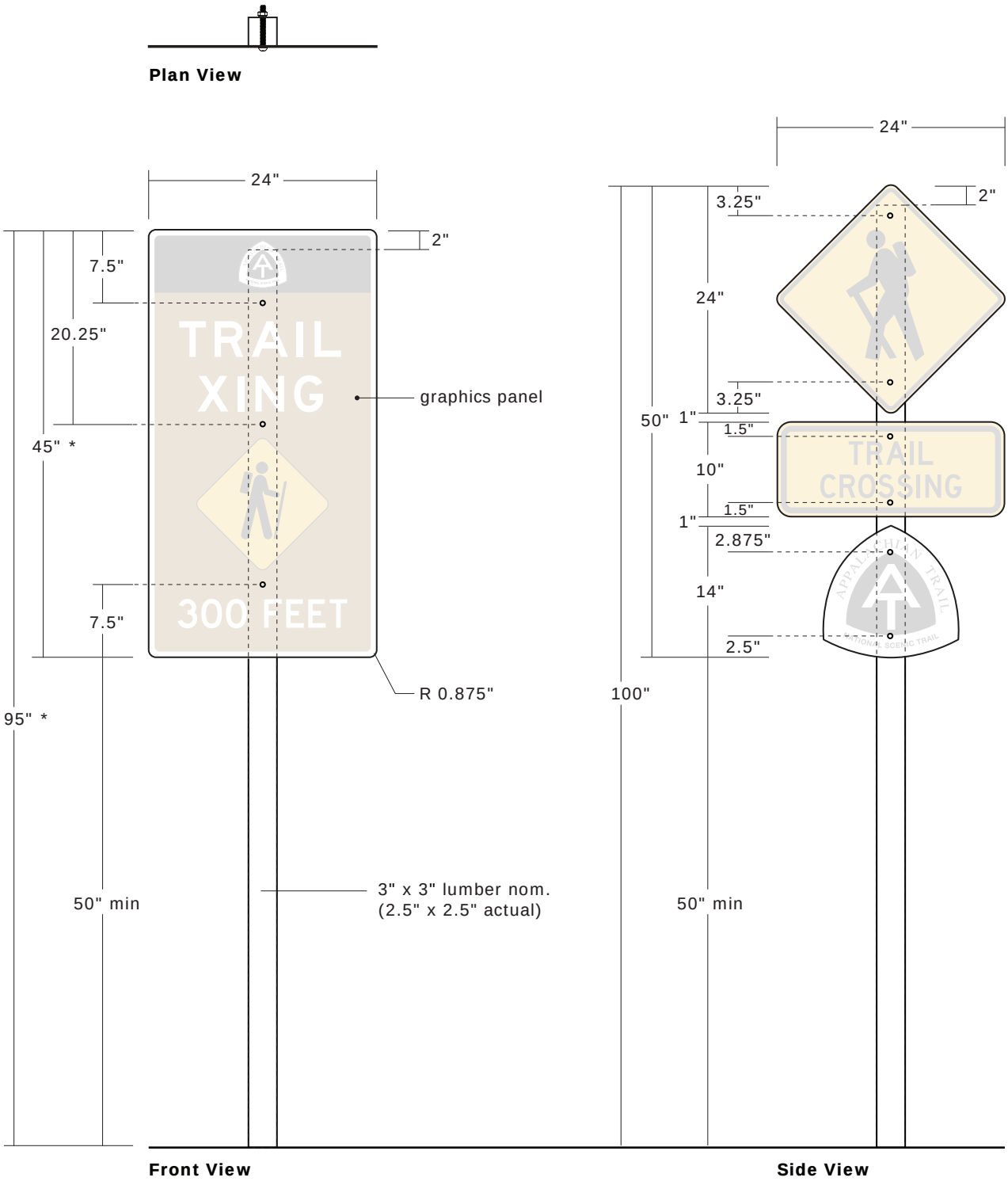
1 Height may vary depending on length of legend. Maximum height is 50".

Scale: 1" = 1'- 0"
Sign type: ADVT

Alternate U.S. Forest Service compatible styling

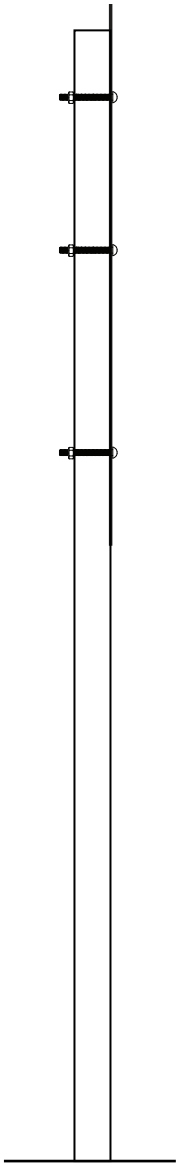
1 Height may vary depending on length of legend. Maximum height is 50".

Scale: 1" = 1'- 0"
Sign type: ADVT

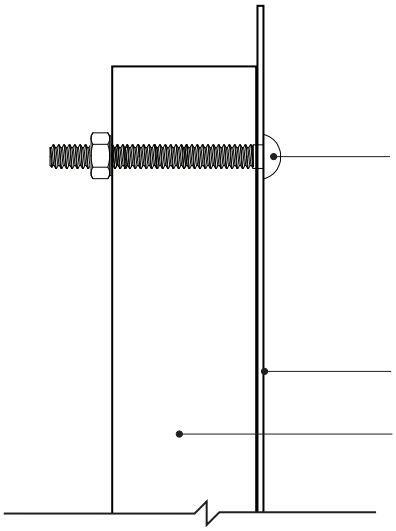


*Total height will vary based on height of panel

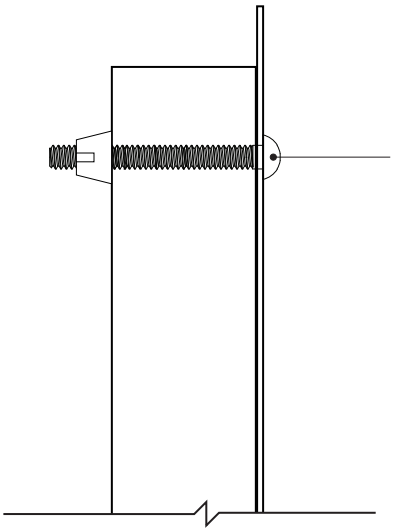
Scale: 0.75" = 1' - 0"
Sign type: ADVT



Side View
0.75" = 1' - 0"



Connection Detail - Option 1
3" = 1' - 0"



Connection Detail - Option 2
3" = 1' - 0"

* Check with federal, state, and local regulations for breakaway requirements. A breakaway post is designed to break away if struck thereby lessening the impact and damage to a vehicle and minimizing injury to occupants.

Scale: As shown
Sign type: ADVT

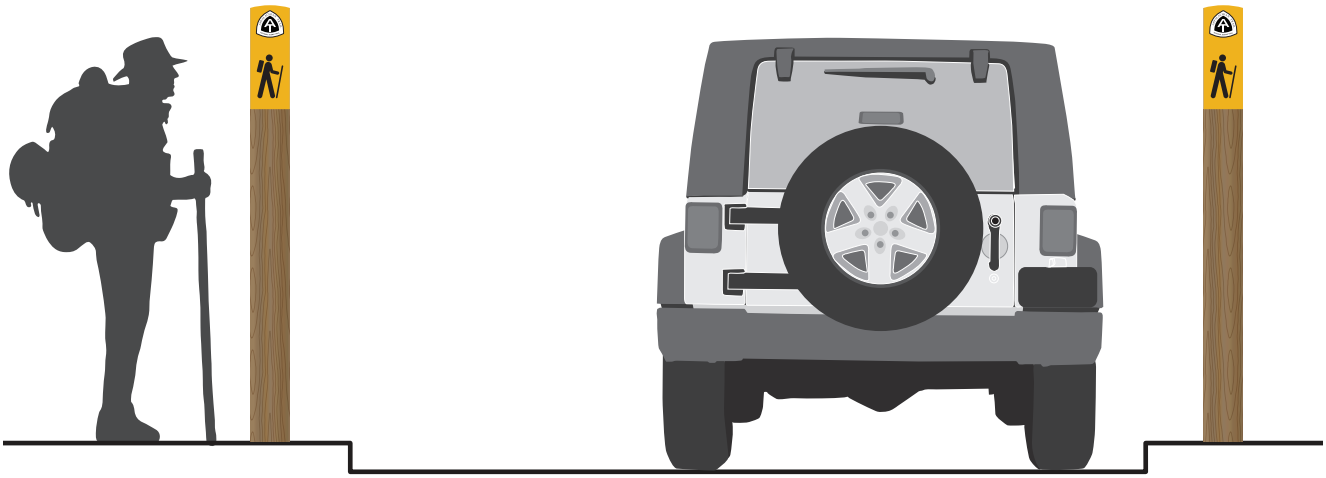
XING Trail Crossing Marker

Trail Crossing Markers are intended to alert motorists and pedestrians of the exact location of a potentially hazardous crossing.

For motorists, the Appalachian National Scenic Trail logo and the international hiker icon are visible on approach. For pedestrians, a white blaze is visible.

These signs are mounted at a height so as to be visible from a far distance.

The color yellow is designated by the MUTCD for warning messages. See page 4.3 for exact color specifications.



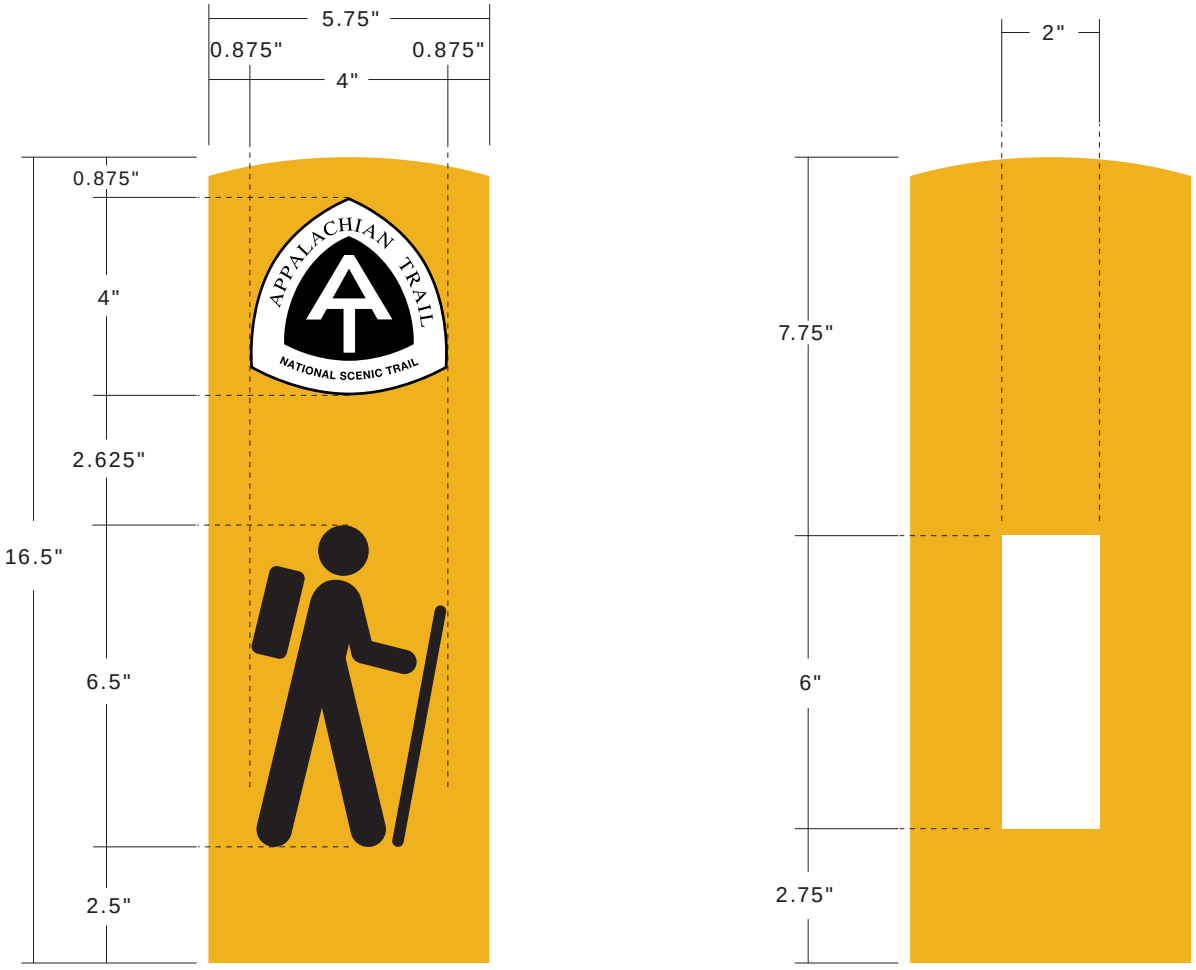
Scale: 3/8" = 1'- 0"
Sign type: XING

Motorist view

Pedestrian view

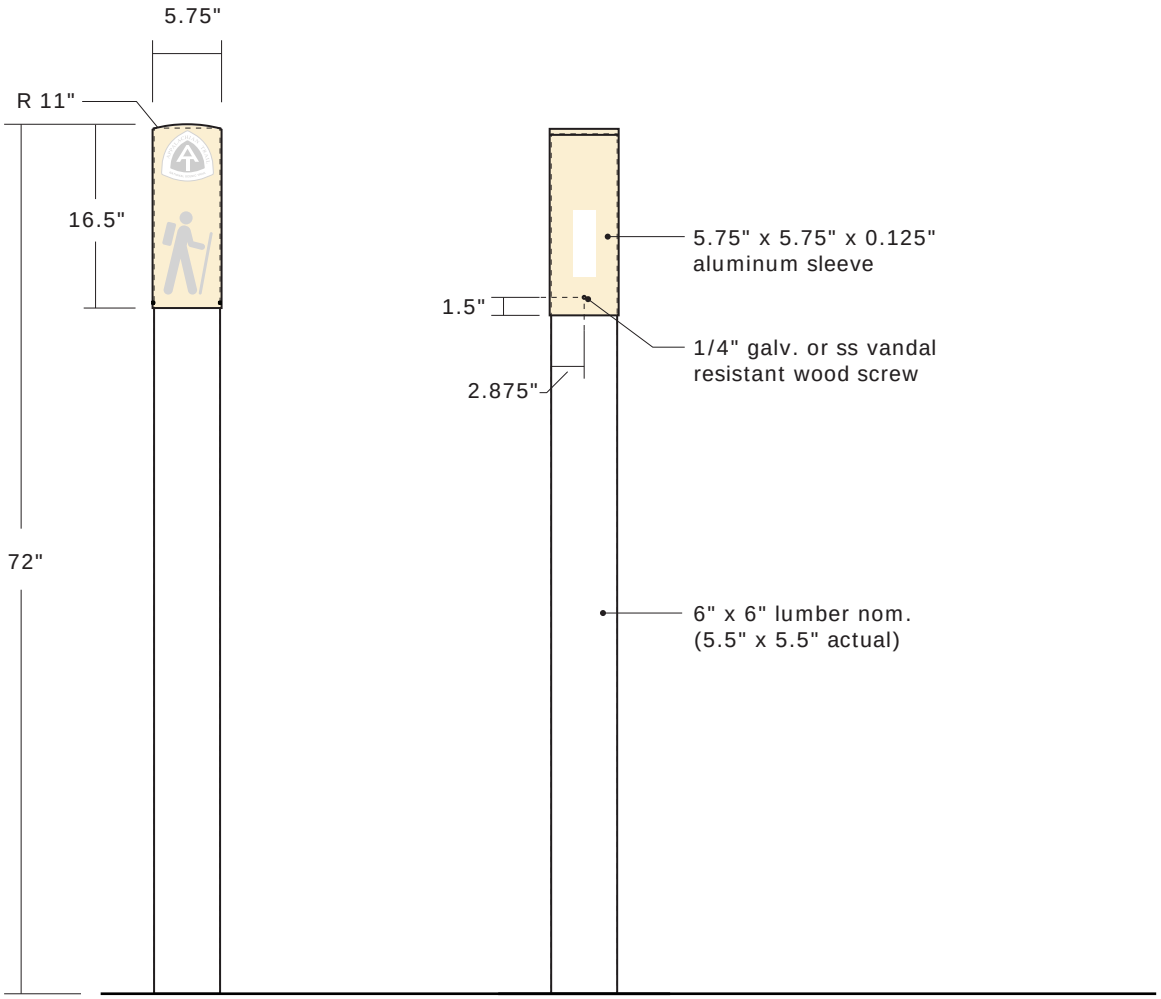
Isometric view

Standard layout



Scale: 3" = 1'- 0"
Sign type: XING

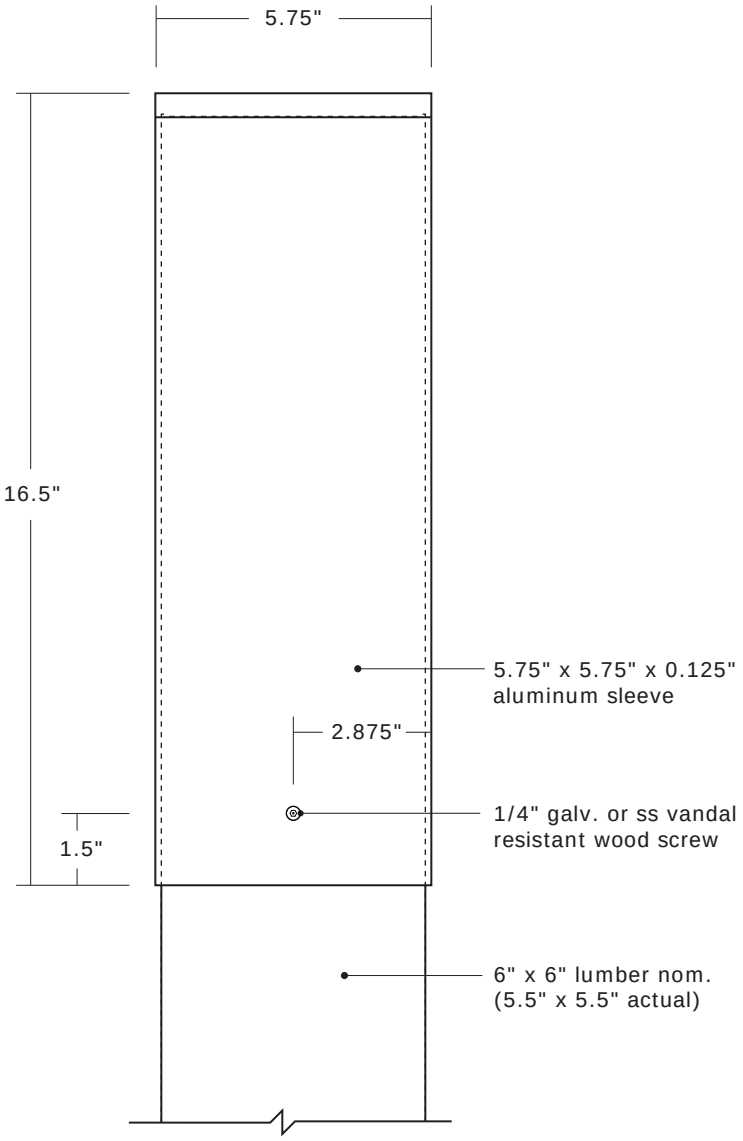
Plan View



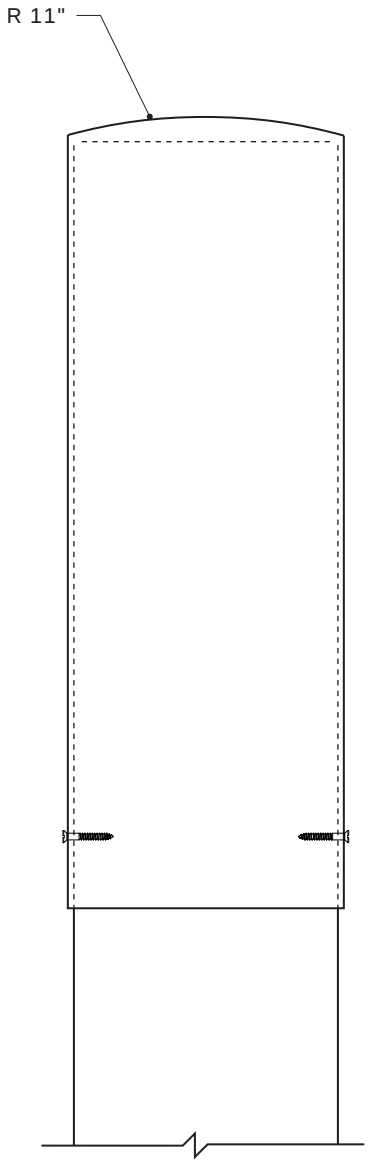
Front View **Side View**

* Check with federal, state, and local regulations for breakaway requirements. A breakaway post is designed to break away if struck thereby lessening the impact and damage to a vehicle and minimizing injury to occupants.

Scale: 0.75" = 1' - 0"
Sign type: XING



Connection Detail



Connection Detail

Scale: 3" = 1' - 0"
Sign type: XING

MAIN Main Identification

Main Identification signs fulfill several functions:

– Clearly identify sites for both motorists and pedestrians

– Acknowledge sites as part of the Appalachian National Scenic Trail

– List local trail club(s) who maintains the site

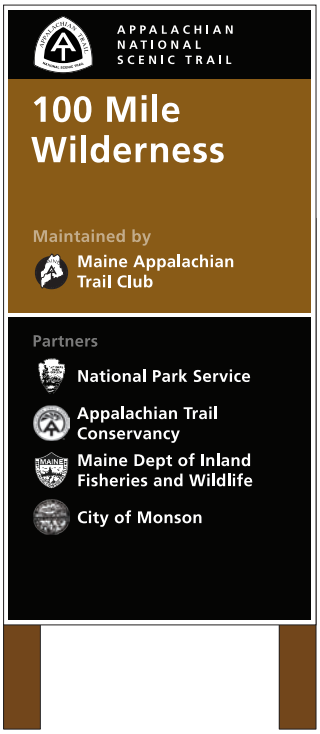
– Secondarily list all associated partners

There is space along the left side of the panel for partners to display their logo. All logos must be black and white (or grayscale if a black and white version is not available) to prevent the sign from becoming too busy.

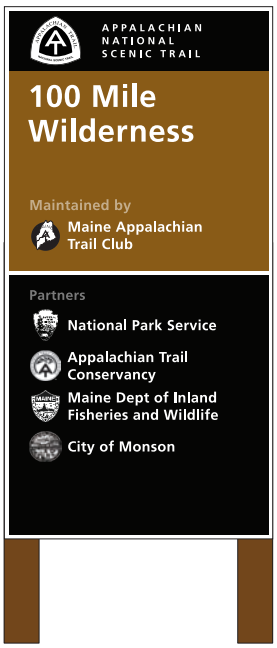
The vertical design is the standard for the MAIN sign. This orientation is preferred because it is most visible. A horizontal design is available for use in locations where certain restrictions prohibit use of the vertical orientation (e.g. visible obstructions/foliage, lack of height, a scenic view, etc). The horizontal orientation should only be used if the vertical orientation cannot be.

There are two color schemes shown. The brown sign with the black header is the standard and will be used at all NPS and partner sites. The brown sign with the ivory header is an alternate USFS compatible style that may only be used at USFS sites. See page 4.3 for exact color specifications.

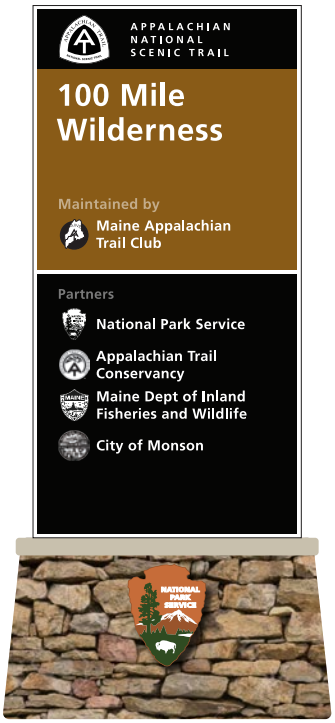
Scale: 3/8" = 1'- 0"
Sign type: MAIN



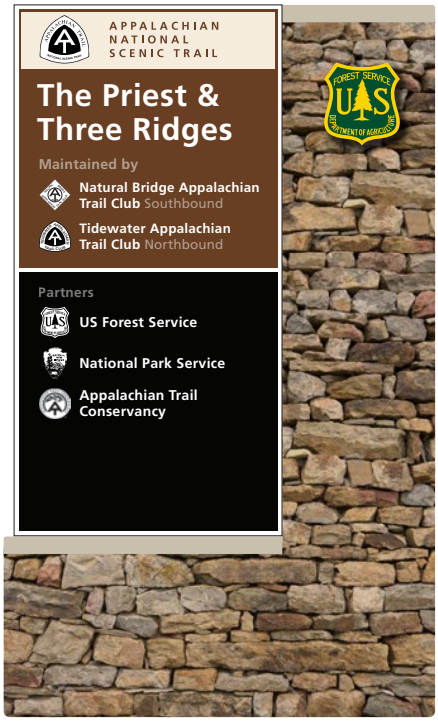
Example 1
Two post, large



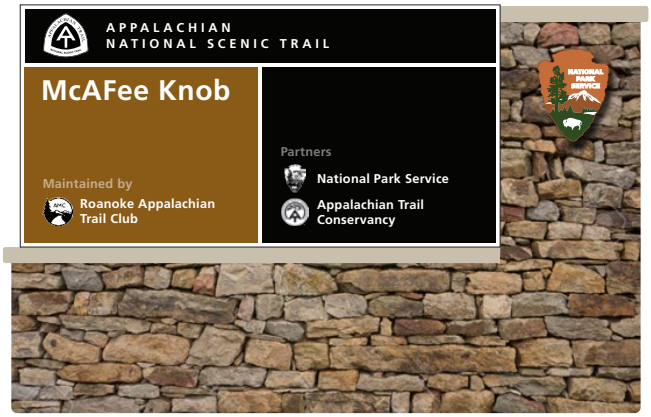
Example 2
Two post, small



Example 3
Stone base, short

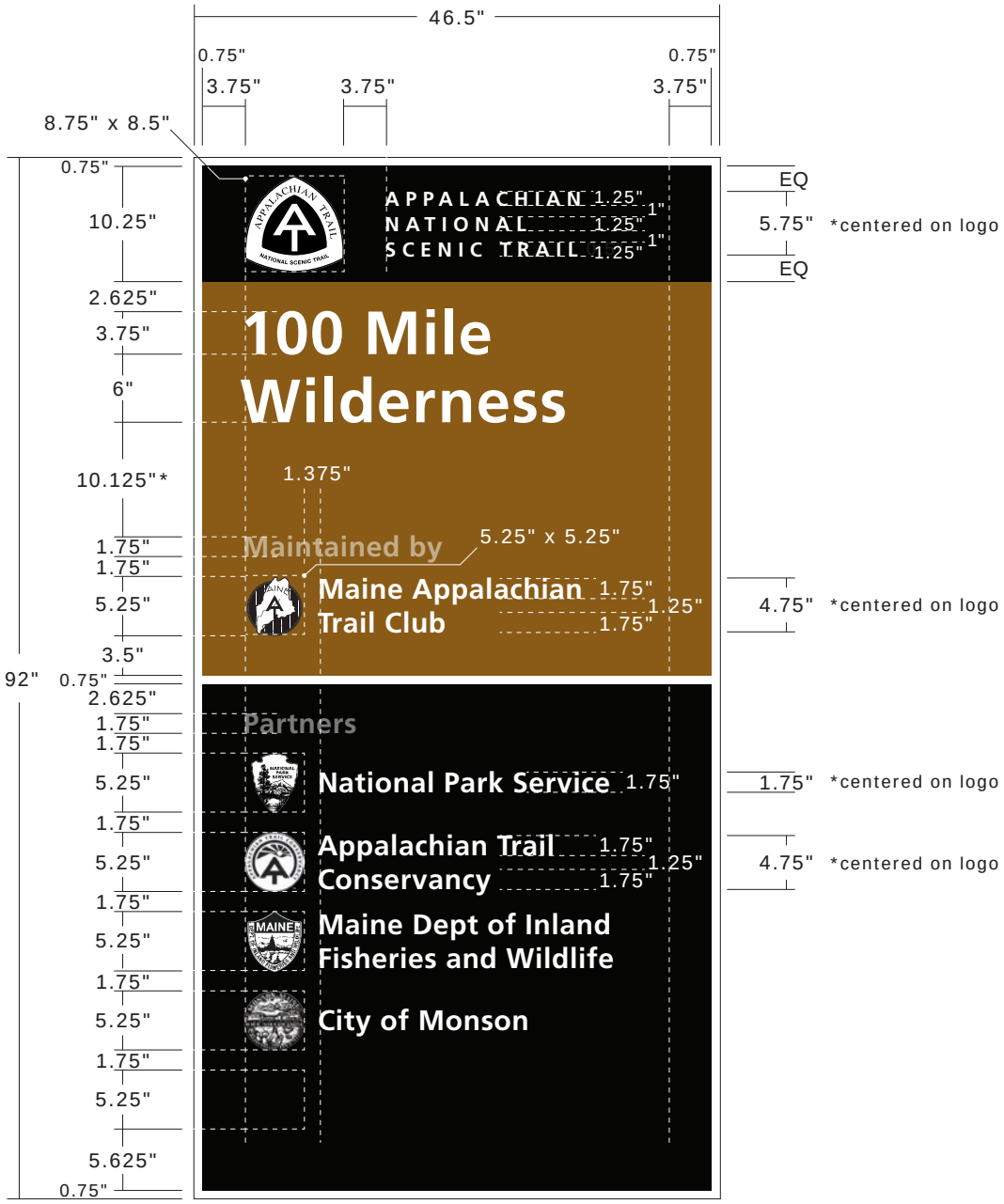


Example 4
Stone base, tall



Example 5
Stone base, horizontal

Standard layout

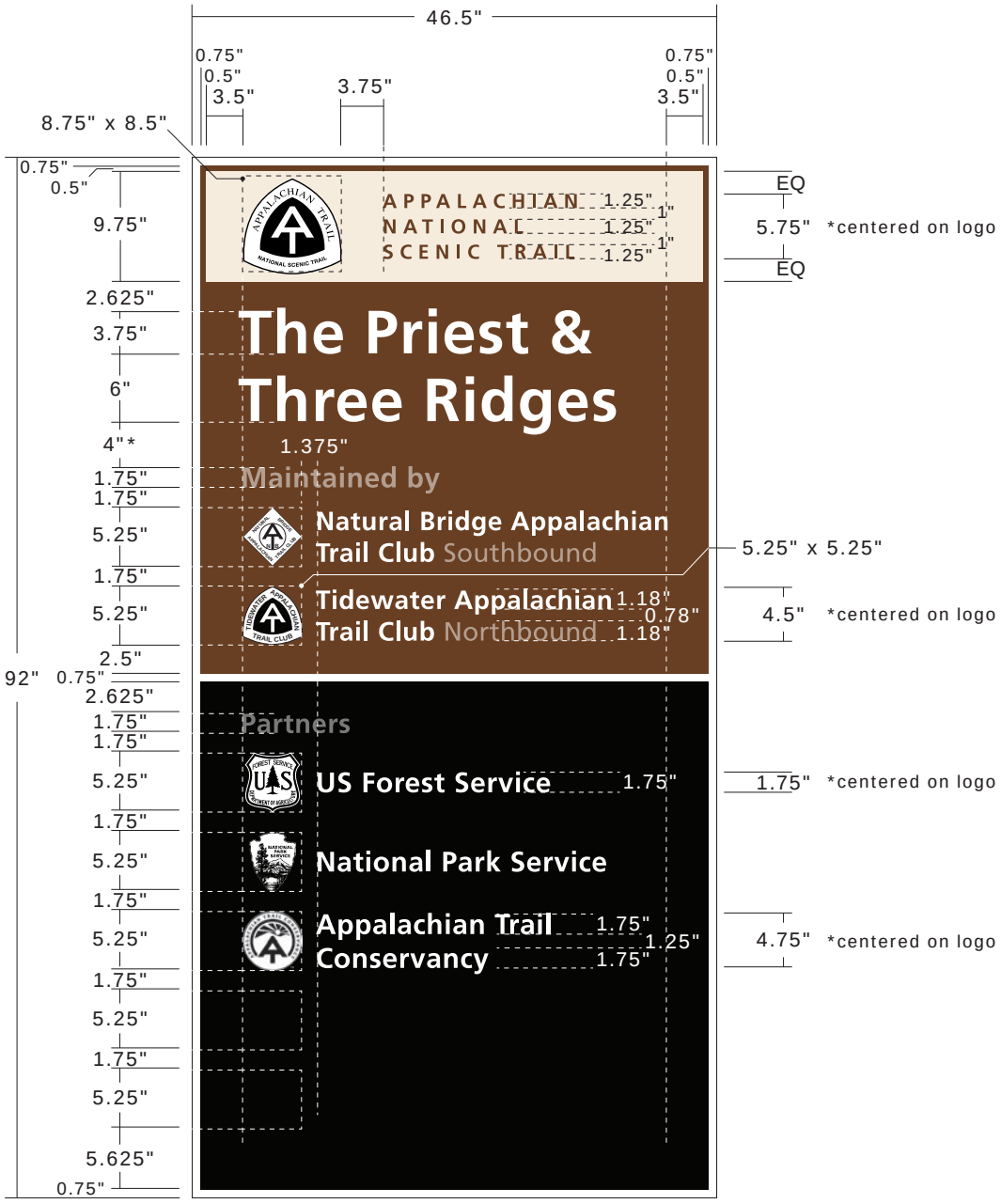


1 Maximum of two (2) trail clubs in upper section and five (5) partner names and logos in lower section.

*This space will vary depending on the number of Trail Clubs represented.

Scale: 0.75" = 1'- 0"
Sign type: MAIN-L

Alternate U.S. Forest Service compatible styling



1 Maximum of two (2) trail clubs in upper section and five (5) partner names and logos in lower section.

*This space will vary depending on the number of Trail Clubs represented.

Scale: 0.75" = 1'- 0"
Sign type: MAIN-L

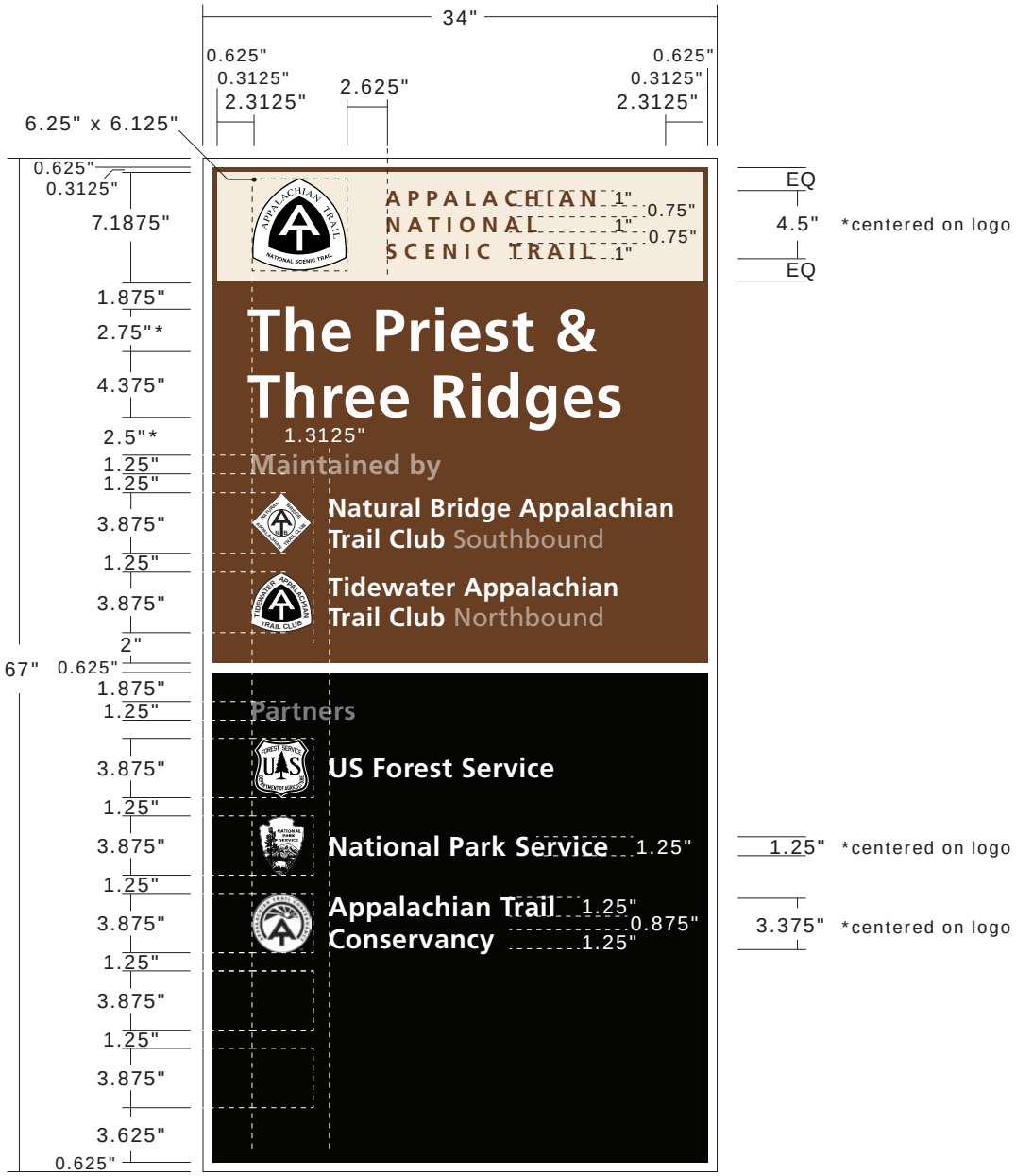
Standard layout

1 Maximum of two (2) trail clubs in upper section and five (5) partner names and logos in lower section.

*This space will vary depending on the number of Trail Clubs represented.

Scale: 1" = 1'- 0"
Sign type: MAIN-S

Alternate U.S. Forest Service compatible styling

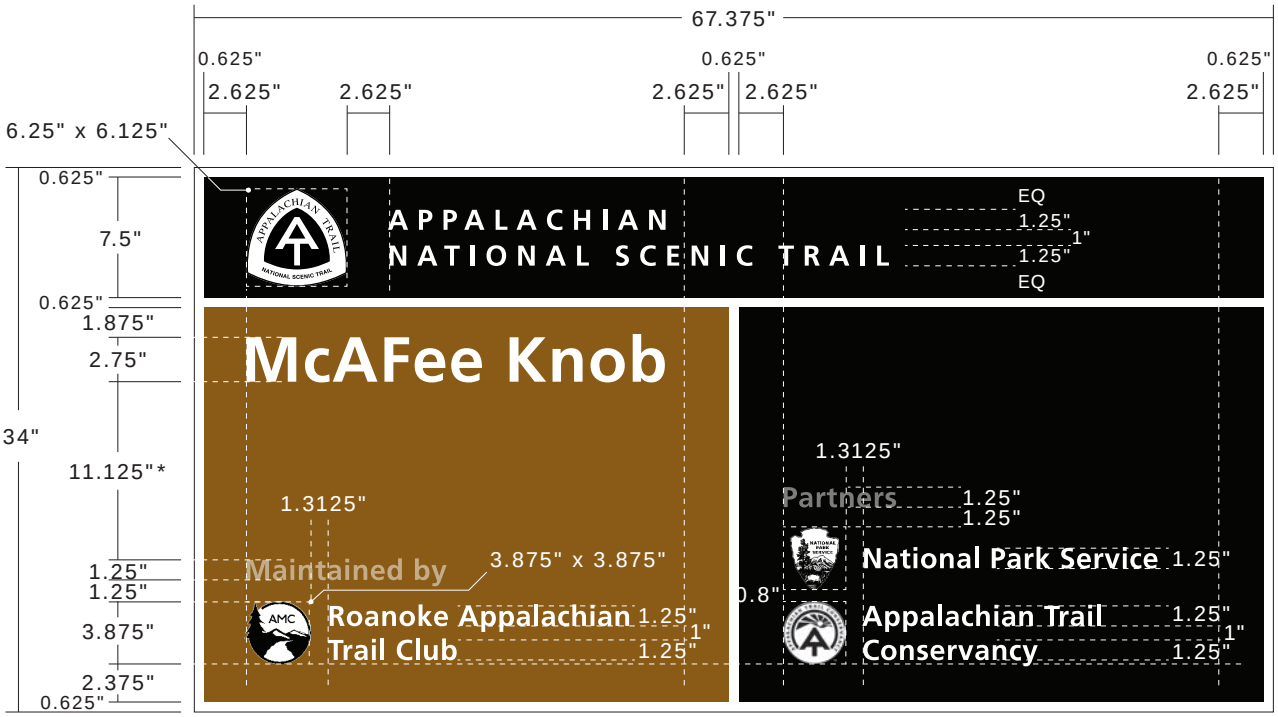


1 Maximum of two (2) trail clubs in upper section and five (5) partner names and logos in lower section.

*This space will vary depending on the number of Trail Clubs represented.

Scale: 1" = 1'- 0"
Sign type: MAIN-S

Standard layout



1 Maximum of two (2) trail clubs in upper section and five (5) partner names and logos in lower section.

*If second line of text is needed.

**This space will vary depending on the number of Trail Clubs represented.

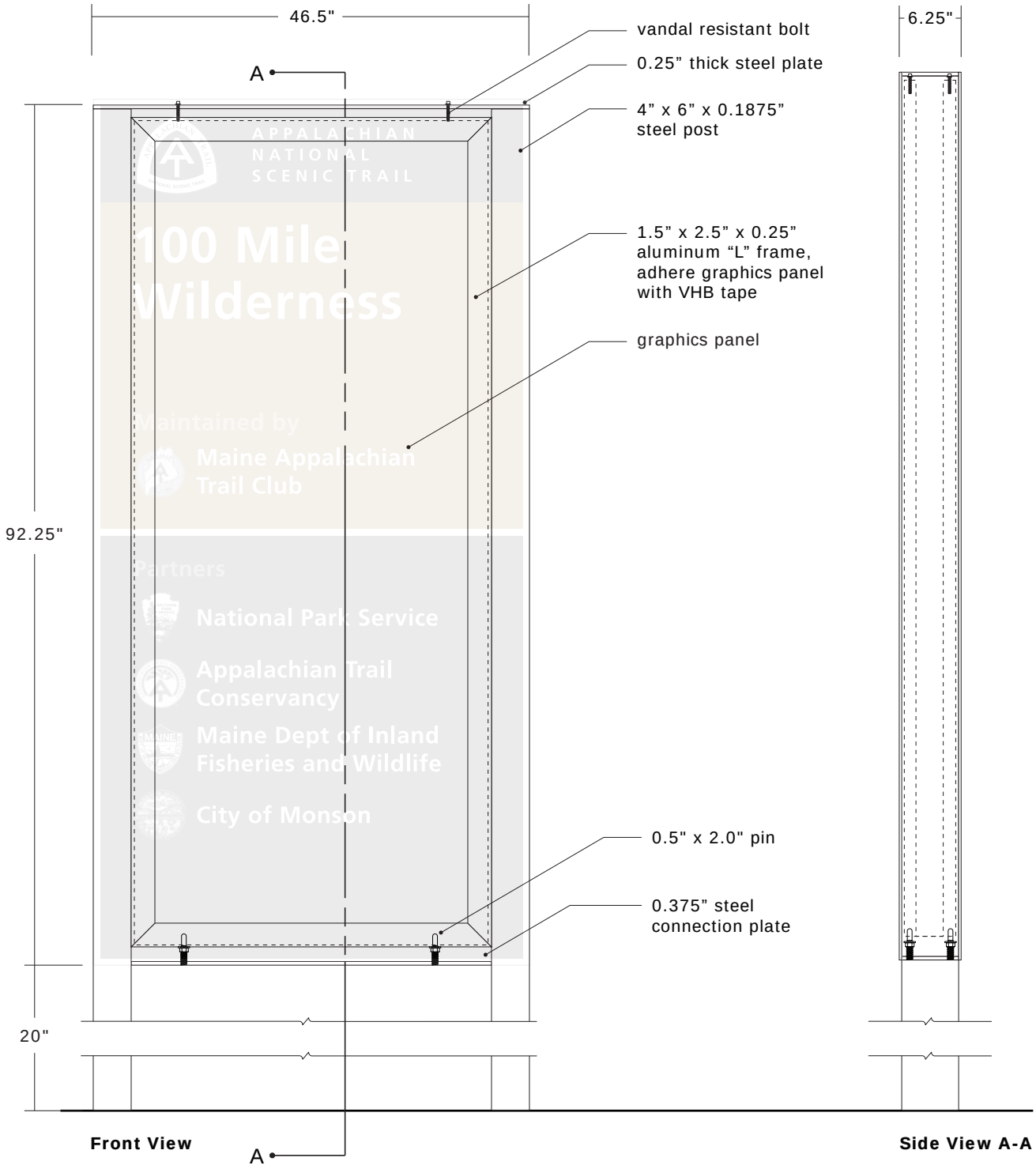
Scale: 1" = 1'- 0"
Sign type: MAIN-H

Alternate U.S. Forest Service compatible styling

1 Maximum of two (2) trail clubs in upper section and five (5) partner names and logos in lower section.

Scale: 1" = 1'- 0"
Sign type: MAIN-H

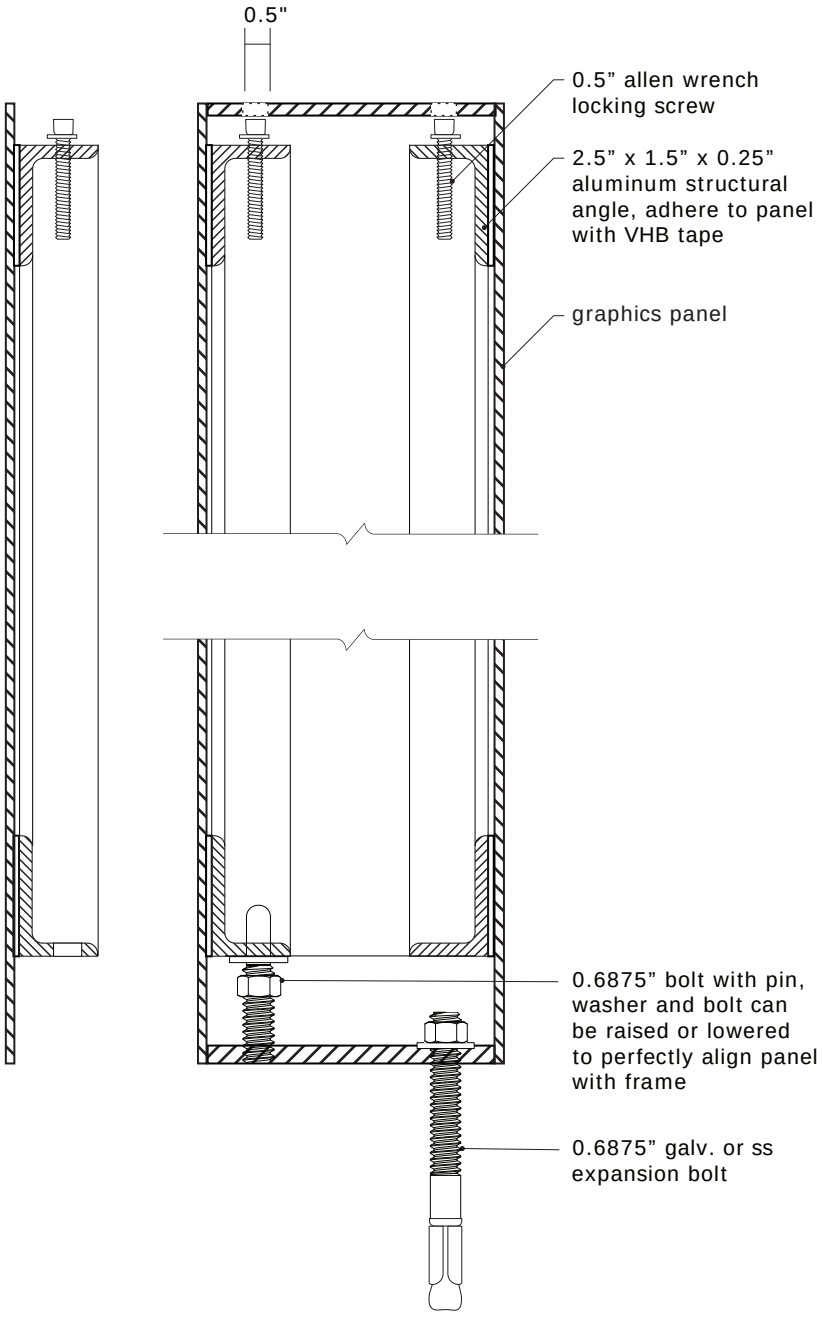
Double Post (Steel) with L Frame



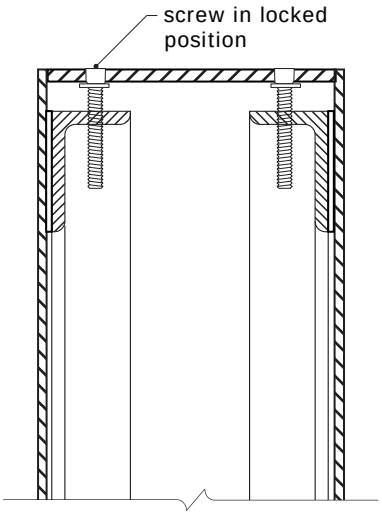
* Check with federal, state, and local regulations for breakaway requirements. A breakaway post is designed to break away if struck thereby lessening the impact and damage to a vehicle and minimizing injury to occupants.

Scale: 0.8125" = 1' - 0"
Sign type: MAIN

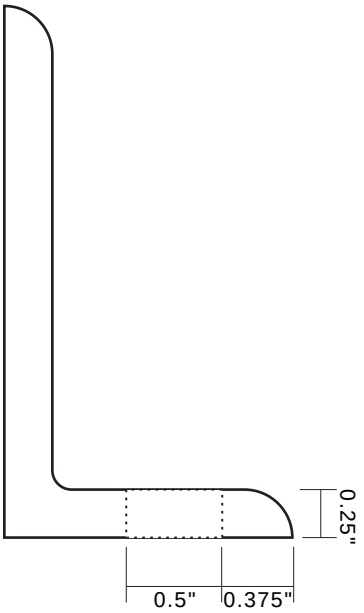
Double Post (Steel) with L Frame *Detail*



Attachment detail
Scale: 1:2



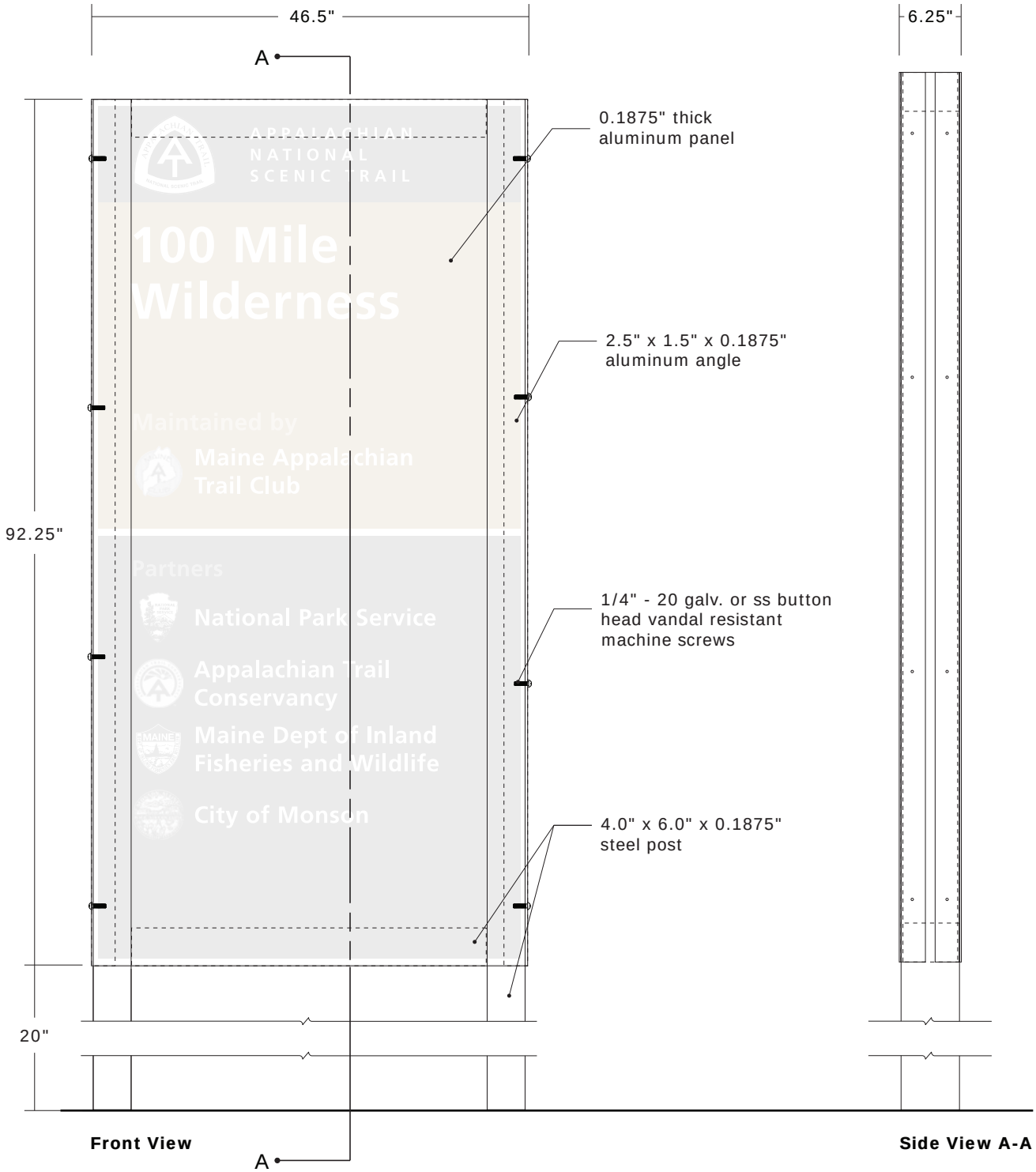
Attachment detail, closed
Scale: 1:2



1.5" x 1.5" x 0.25" structural angle
Scale: 1:1

Scale: As shown
Sign type: MAIN

Double Post (Steel) with Crossbeam

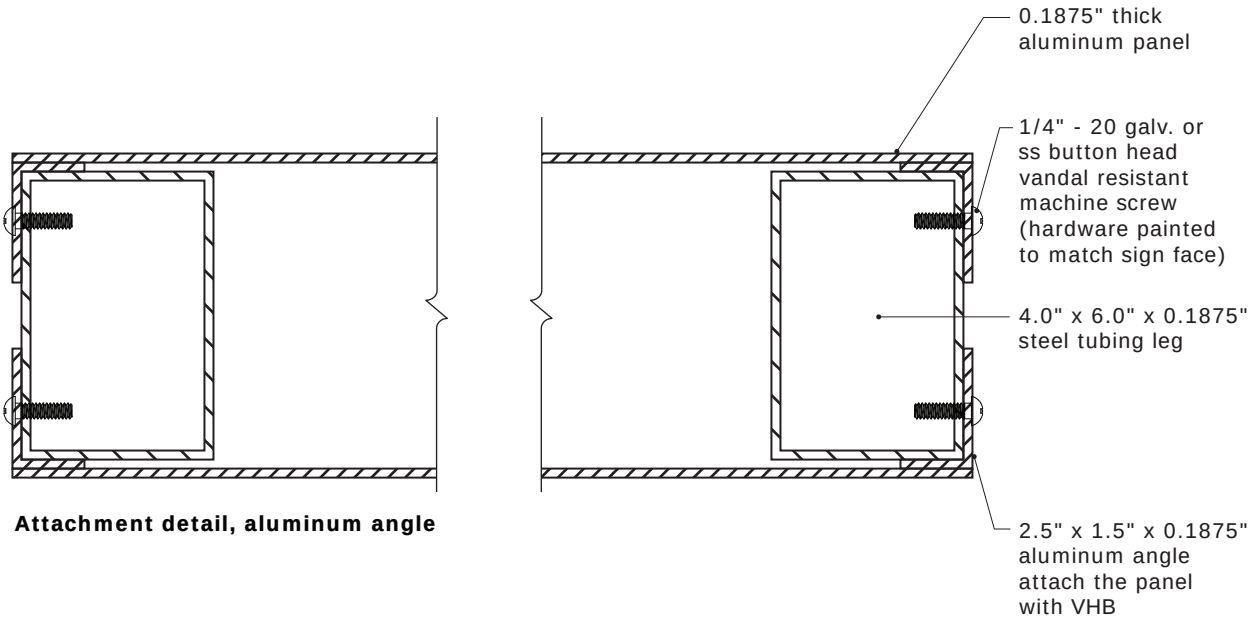


Front View **Side View A-A**

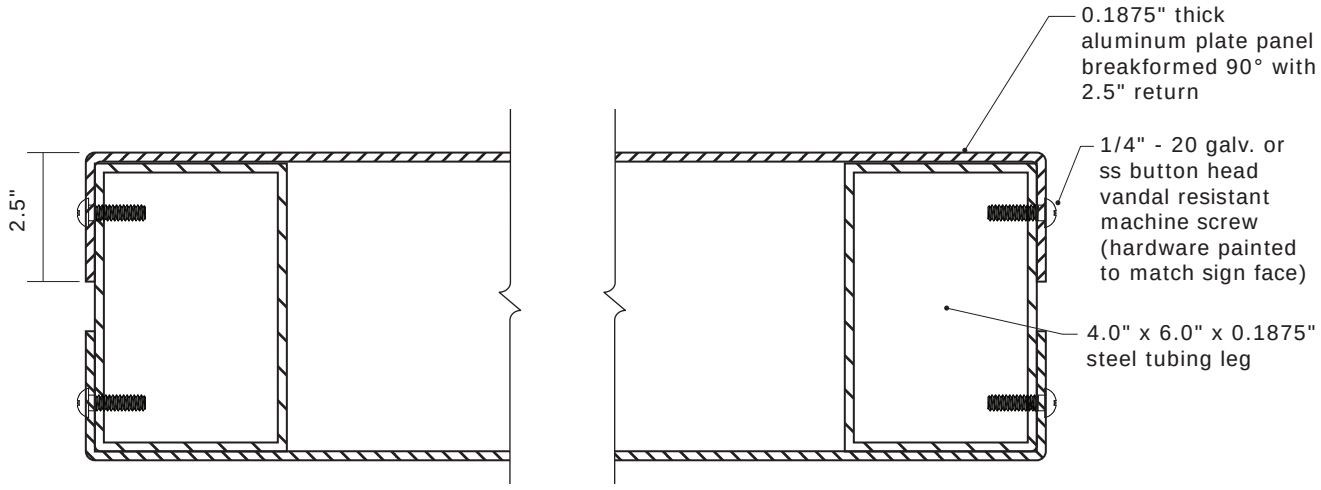
* Check with federal, state, and local regulations for breakaway requirements. A breakaway post is designed to break away if struck thereby lessening the impact and damage to a vehicle and minimizing injury to occupants.

Scale: 0.8125" = 1' - 0"
Sign type: MAIN

Double Post (Steel) with Crossbeam *Detail*



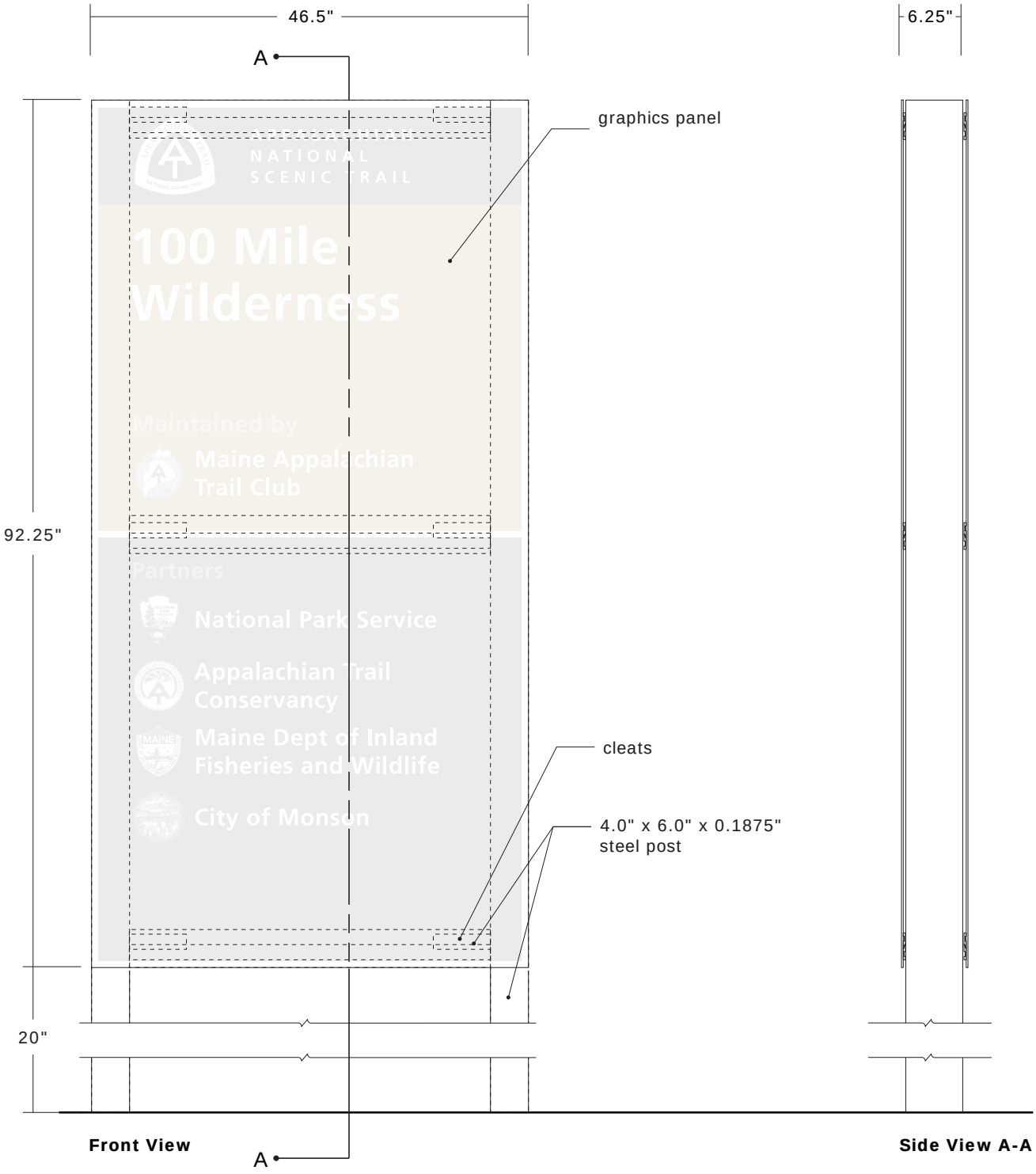
Attachment detail, aluminum angle



Attachment detail, breakformed panel

Scale: 3" = 1' - 0"
Sign type: MAIN

Double Post (Steel) welded

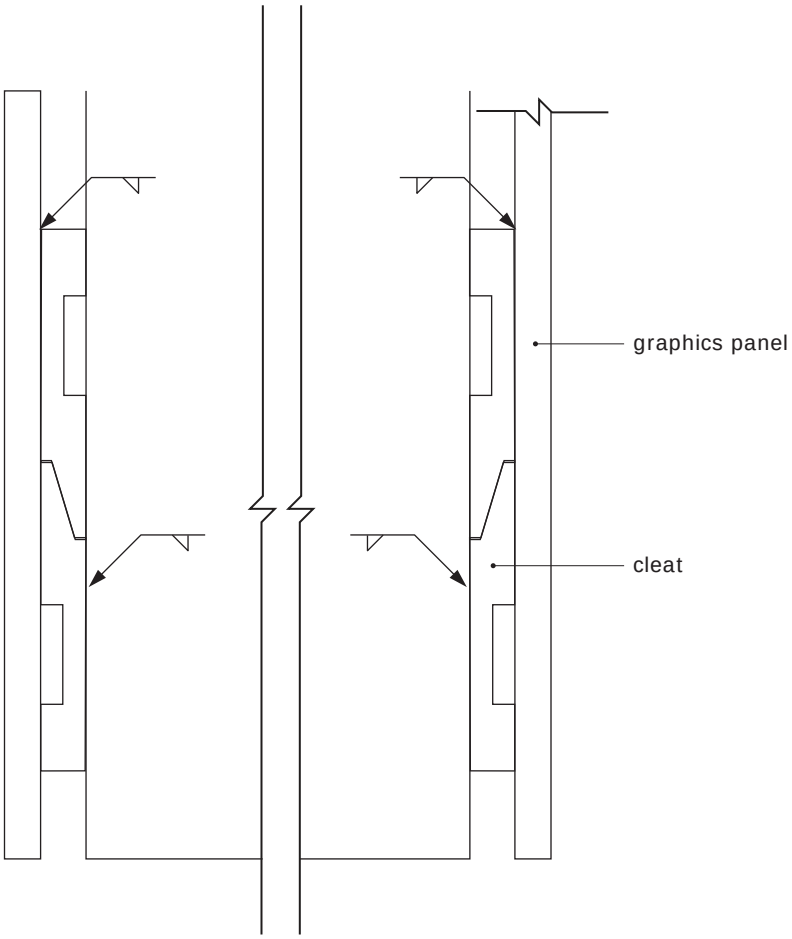


Front View **Side View A-A**

* Check with federal, state, and local regulations for breakaway requirements. A breakaway post is designed to break away if struck thereby lessening the impact and damage to a vehicle and minimizing injury to occupants.

Scale: 0.8125" = 1' - 0"
Sign type: MAIN

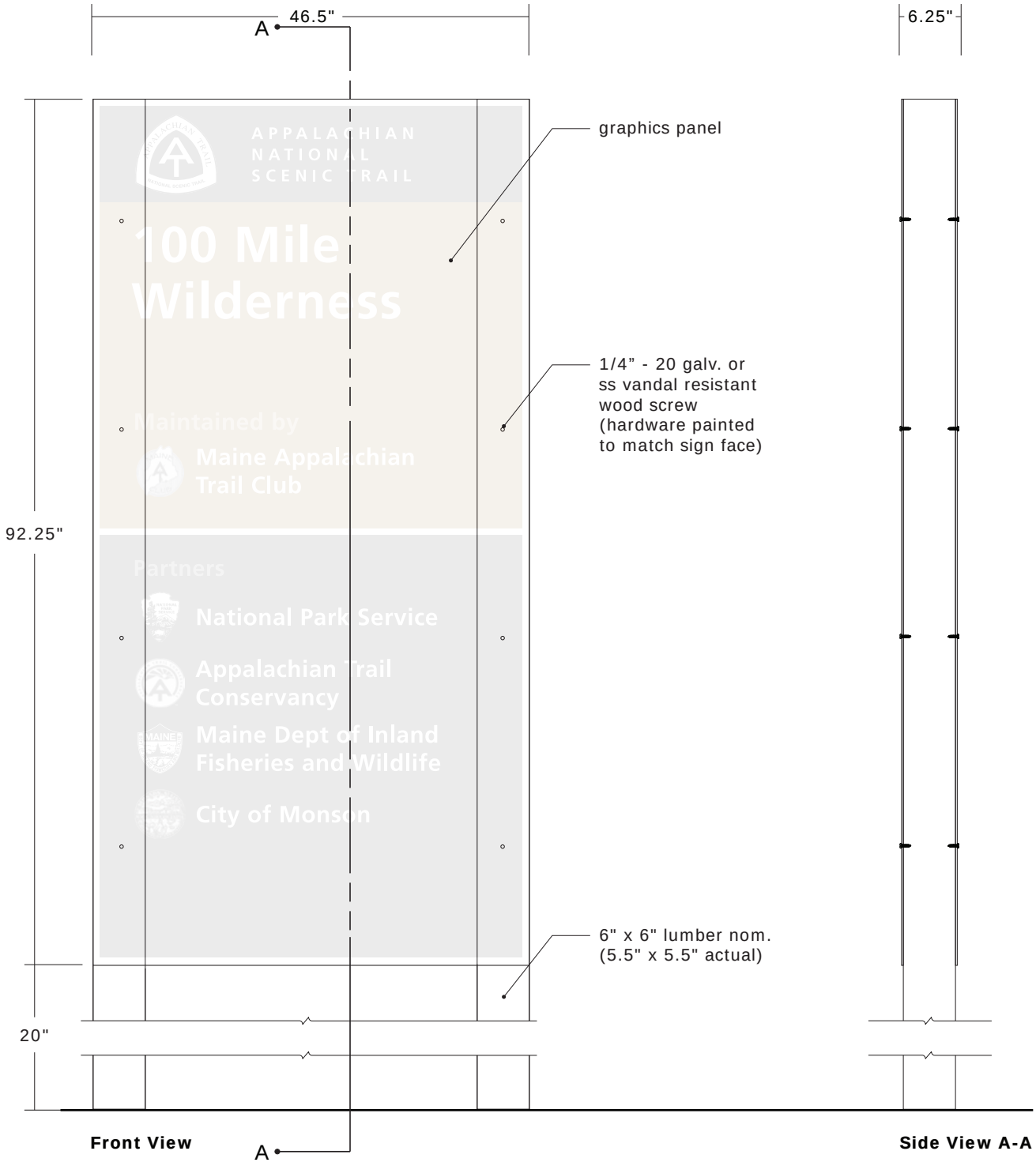
Double Post (Steel) welded *Detail*



Cleat detail

Scale: 1:1
Sign type: MAIN

Double Post (Wood) attached through sign face

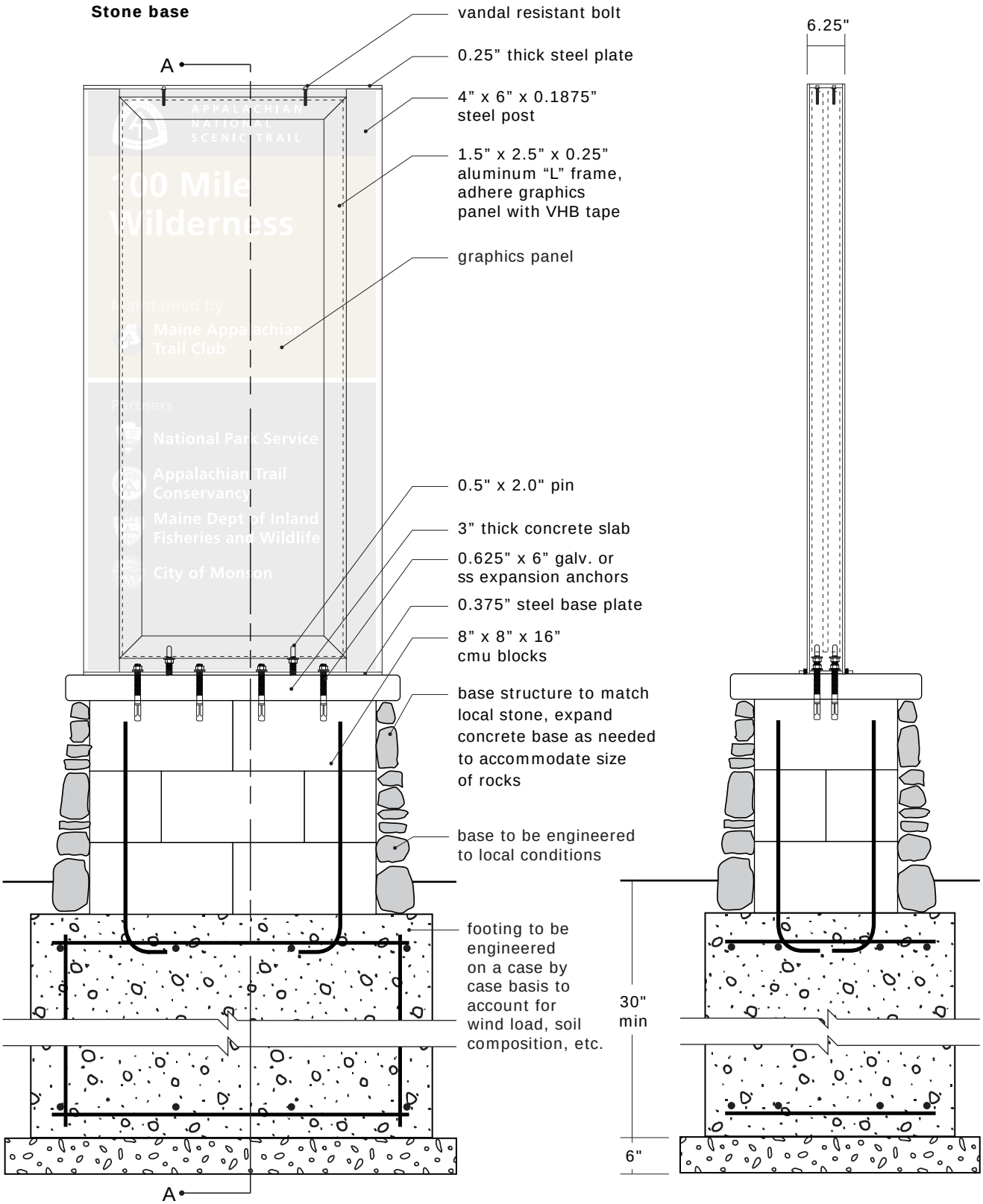


Front View **Side View A-A**

* Check with federal, state, and local regulations for breakaway requirements. A breakaway post is designed to break away if struck thereby lessening the impact and damage to a vehicle and minimizing injury to occupants.

Scale: 0.8125" = 1' - 0"
Sign type: MAIN

Stone base



Front View
Scale: 0.5" = 1' - 0"

Side View A-A
Scale: 0.5" = 1' - 0"

VEHD Vehicular Directional

The Vehicular Directional sign is intended to direct vehicles to destinations. It is only used within the park boundary as it follows NPS standards but not MUTCD standards for use on federal- and state-owned roadways.

The vertical design allows for use in narrow right-of-ways (ROWs).

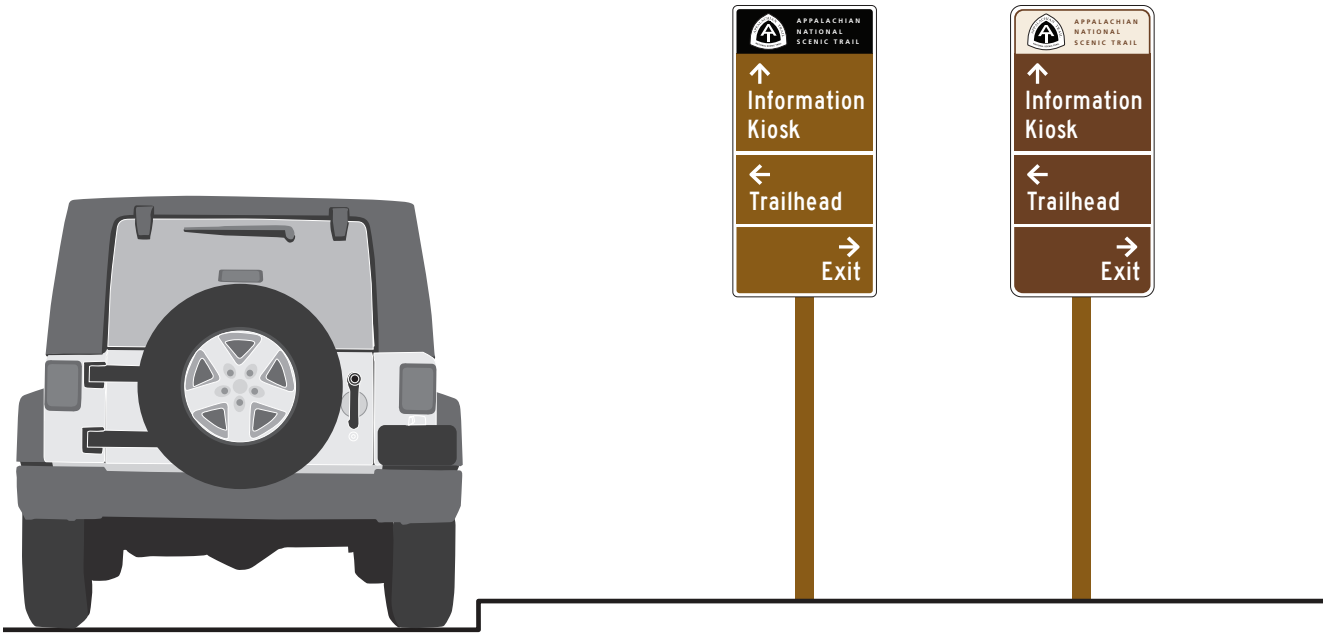
Keep messages as brief as possible and stack phrases. Use of international symbols with messages is encouraged to make messages as accessible as possible to international visitors.

There is a maximum of 4 destinations per panel.

Directional messages are grouped by direction and organized according to standard wayfinding principles:

1. Direction (straight/up, left, right)
2. Distance (closest to furthest)
3. Alphabetical

There are two color schemes shown. The brown sign with the black header is the standard and will be used at all NPS and partner sites. The brown sign with the ivory header is an alternate USFS compatible style that may only be used at USFS sites. See page 4.3 for exact color specifications.



Scale: 3/8" = 1'- 0"
Sign type: VEHD

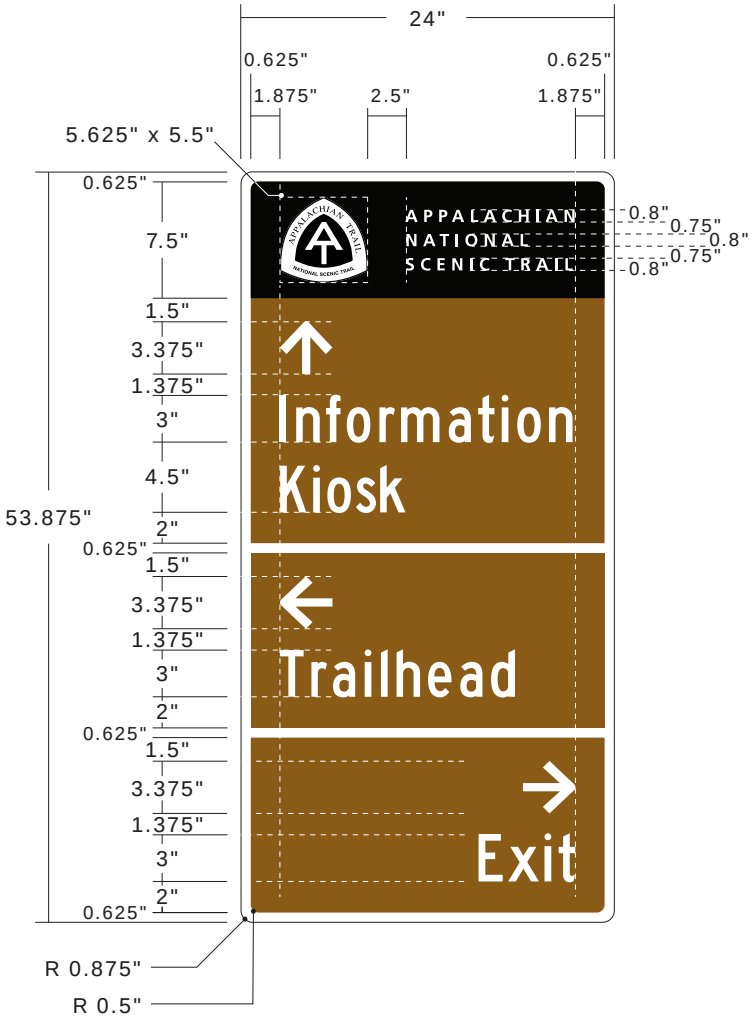
Example 1
Option with no symbol

Example 2
Height varies with
legend length

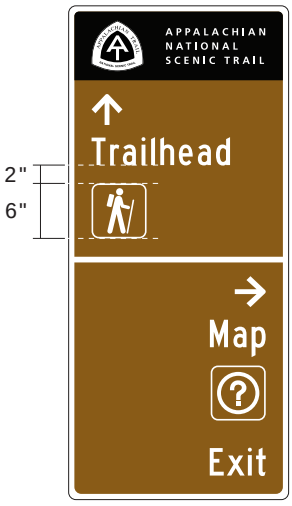
Example 3
Option with symbols

Example 4
Alternate U.S. Forest Service
compatible styling

Standard layout



Space between multiple messages

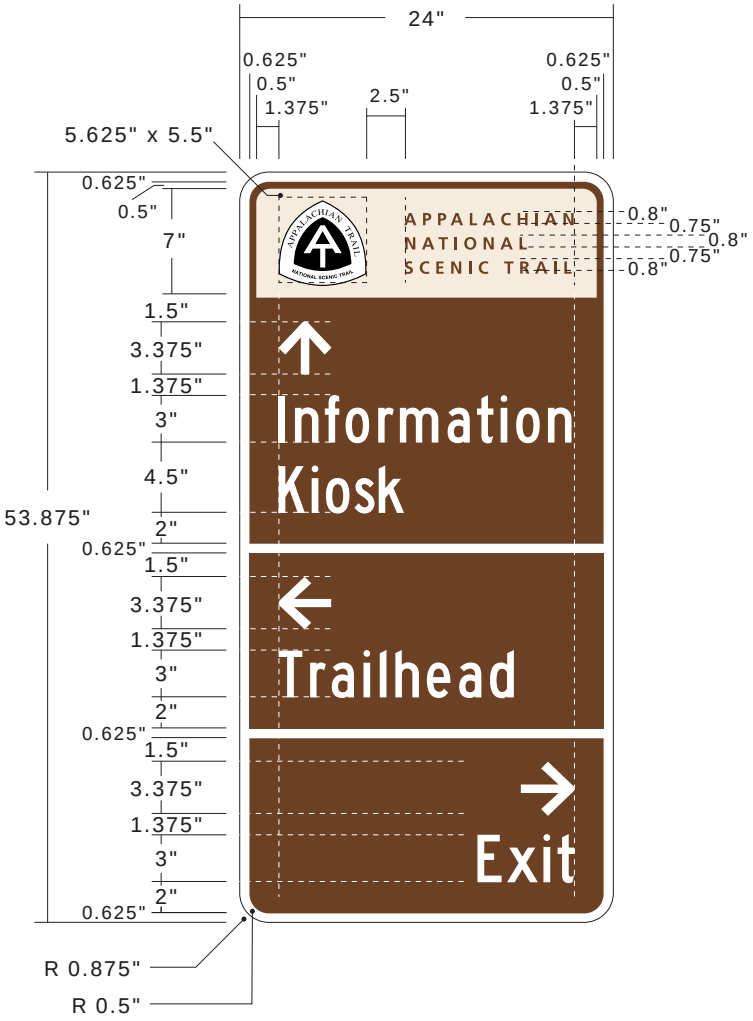


With symbols

1 Height may vary depending on length of legend. Maximum height is 55".

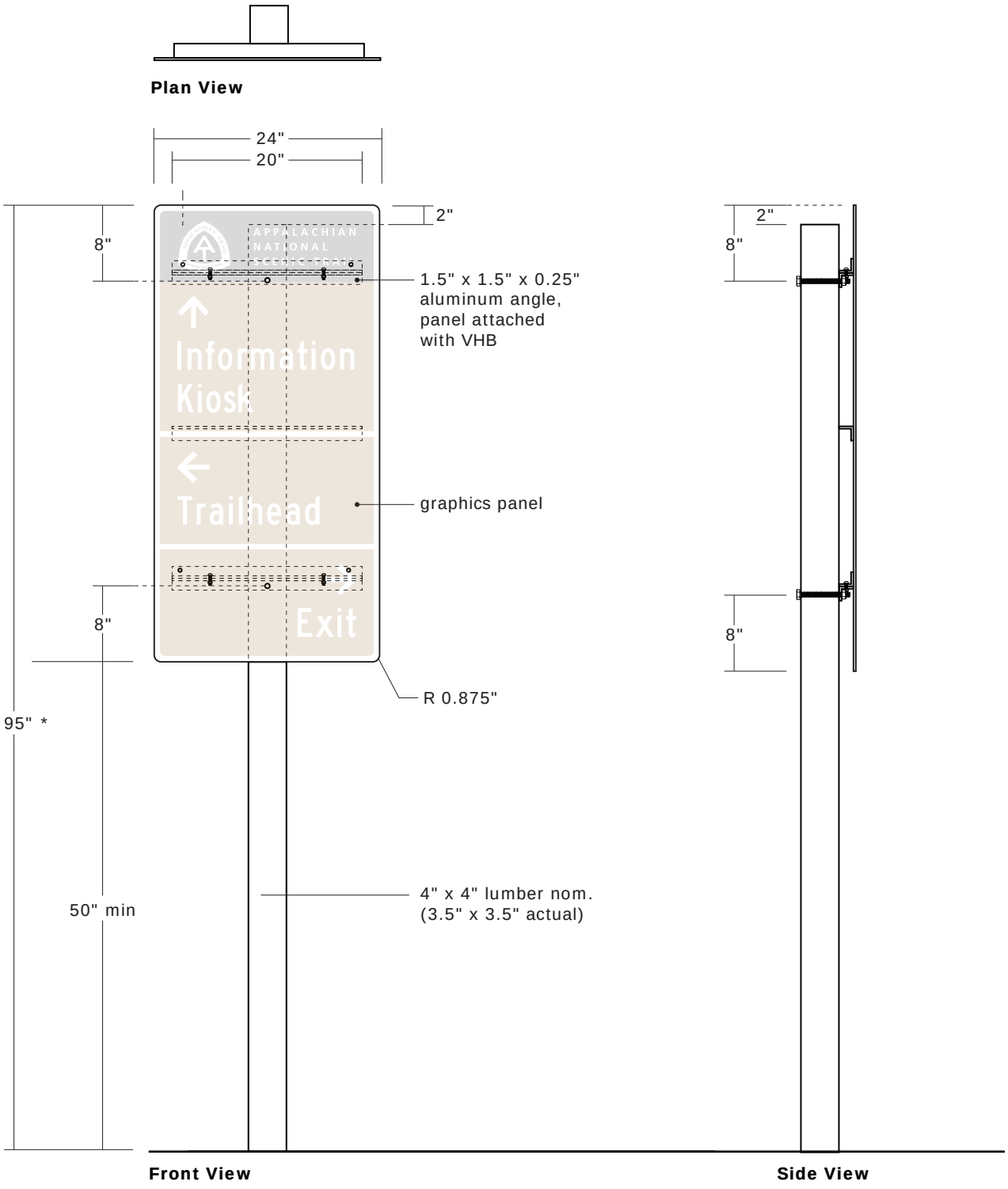
Scale: 1" = 1'- 0"
Sign type: VEHD

Alternate U.S. Forest Service compatible styling



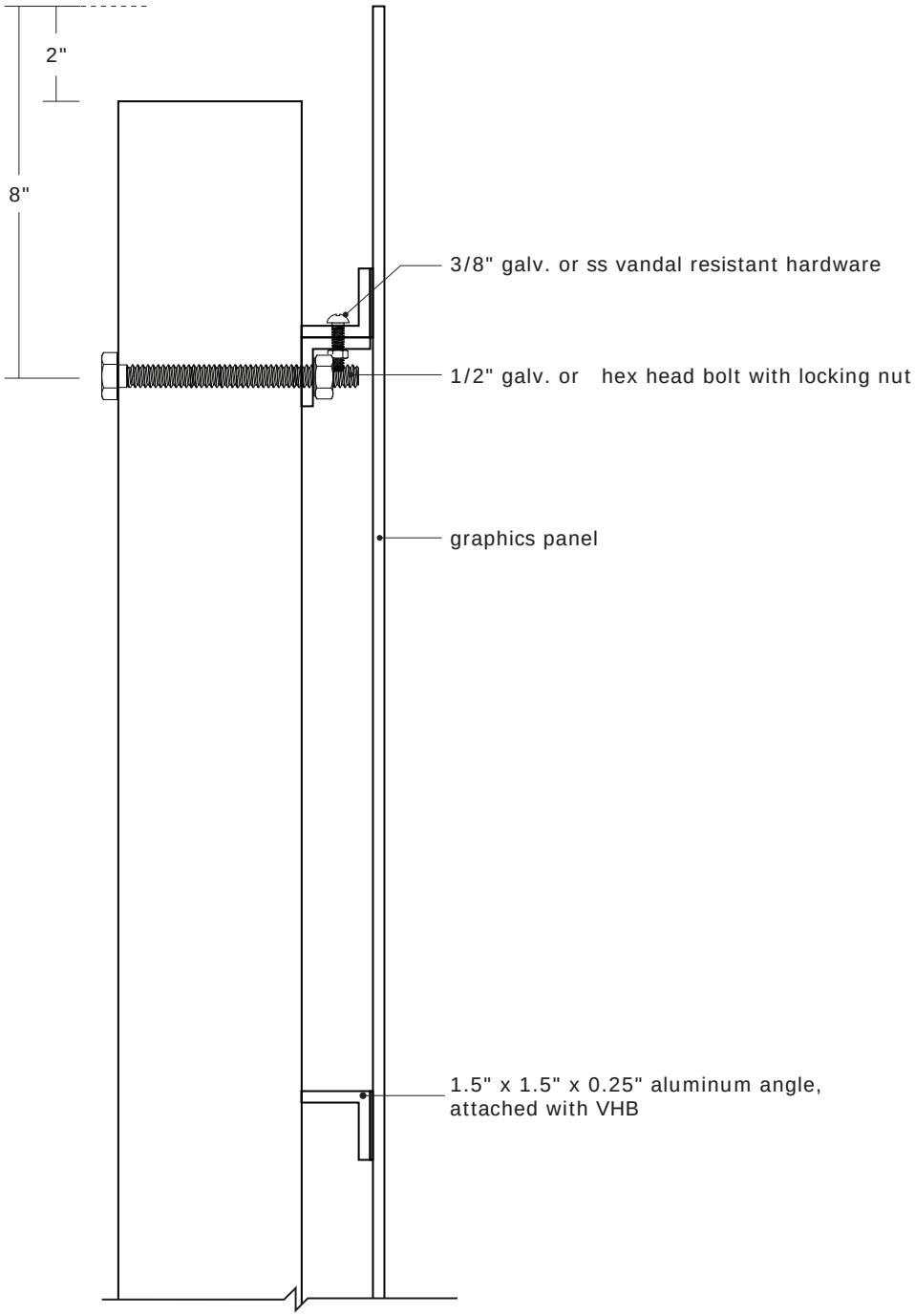
1 Height may vary depending on length of legend. Maximum height is 55".

Scale: 1" = 1'- 0"
Sign type: VEHD



*Total height will vary based on height of panel

Scale: 0.75" = 1' - 0"
Sign type: VEHD



Connection detail

Scale: 3" = 1' - 0"
Sign type: VEHD

PARK Parking Control

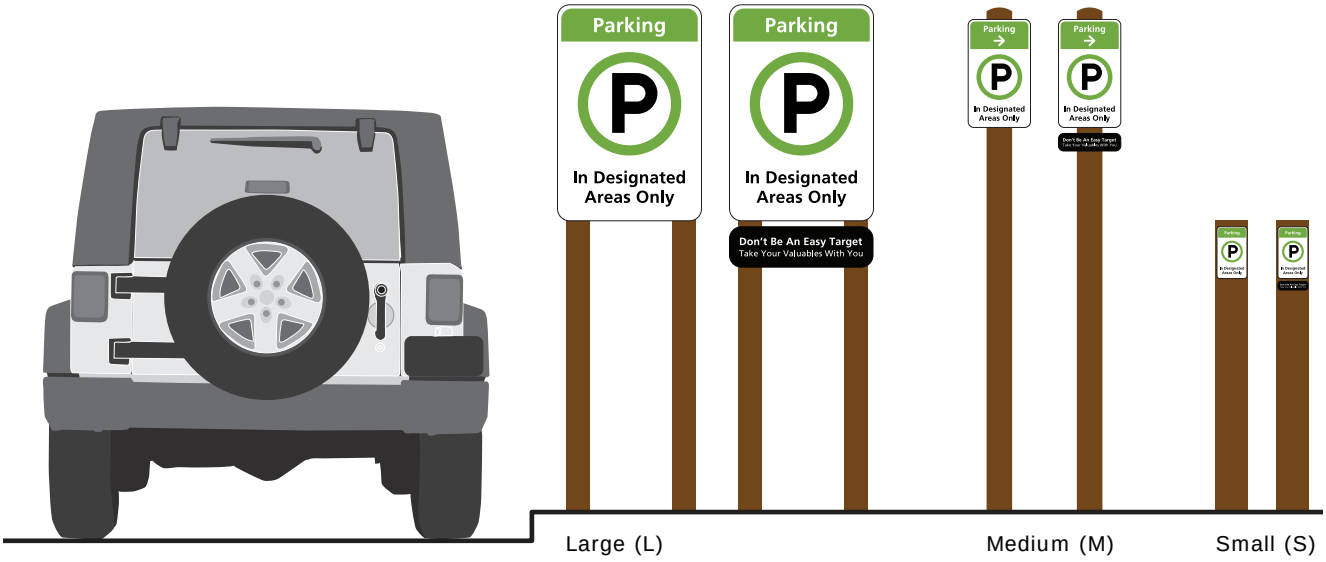
Parking Control signs are intended to help regulate parking areas.

The large option is typically used at the entrance of a site—especially parking areas that accommodate 40+ vehicles. The large sign sets the standard for a parking area and prevents the proliferation of signage. One large sign can be effective when regulations do not change from stall to stall.

The medium option is most commonly used to sign individual stalls or contiguous areas particularly when regulations change from stall to stall.

The small option is used along roadways when you have long distances where a message—such as "No Parking Any Time"—needs to be reiterated.

There are two color schemes shown for the gate-mounted version. The brown sign with the black header is the standard and will be used at all NPS and partner sites. The brown sign with the ivory header is an alternate USFS compatible style that may only be used at USFS sites. See page 4.3 for exact color specifications.



Scale: 3/8" = 1'- 0"
Sign type: PARK

PARK-L, PARK-M, PARK-S messages

Example 1

Example 2

Example 3

Example 4

Example 5

Example 6

Example 7

Example 8

Example 9

Example 10

Example 11

Example 12

Example 13

Example 14

Example 15

Example 16

Supplemental 1

Supplemental 2

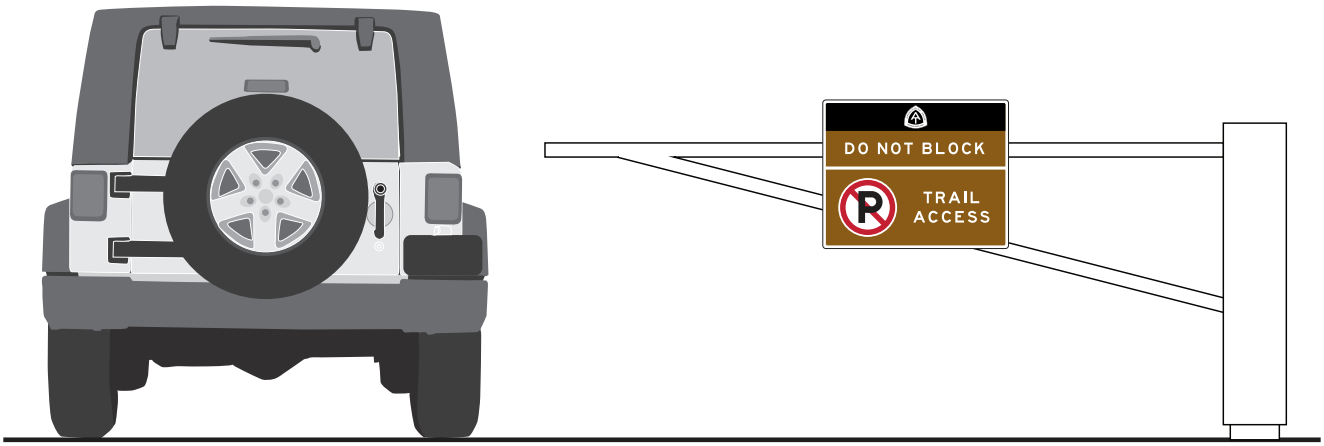
PARK-G messages

Example 1

Example 2

Example 3

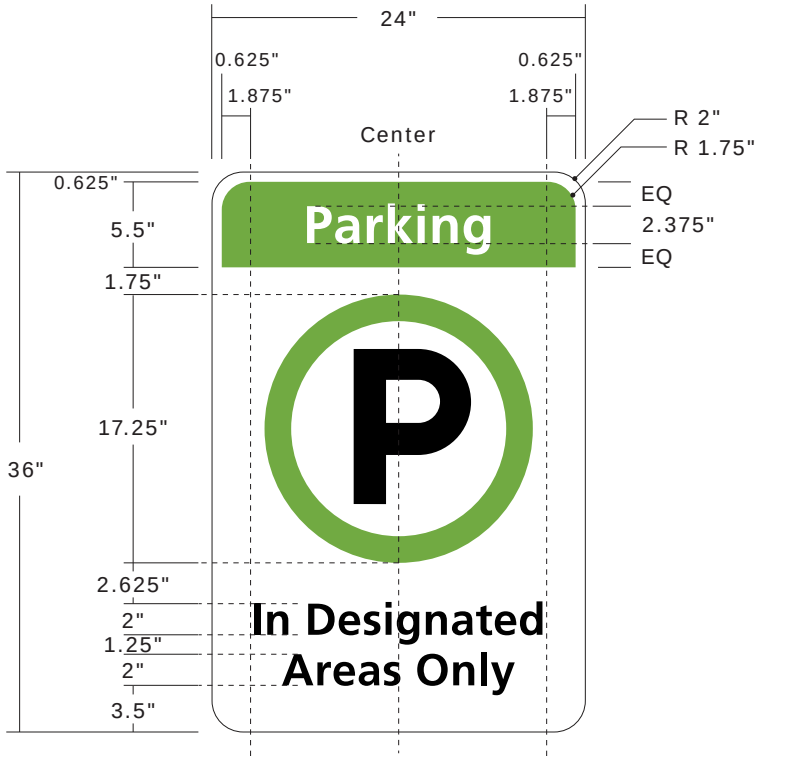
Example 4



Gate (G)

Scale: 3/8" = 1'- 0"	
Sign type: PARK	

Standard layout - Large



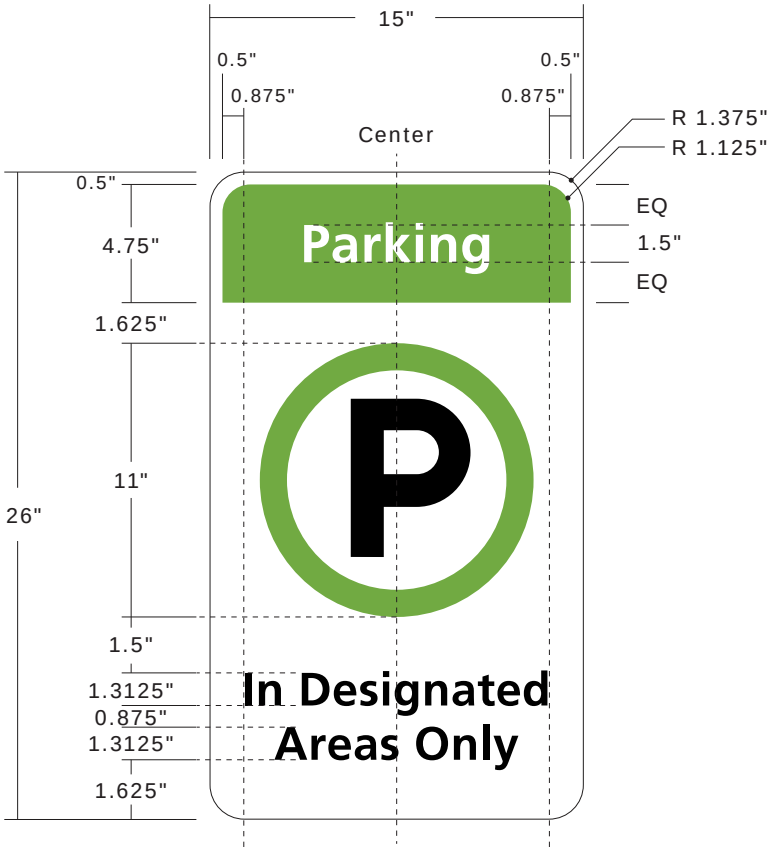
Variations

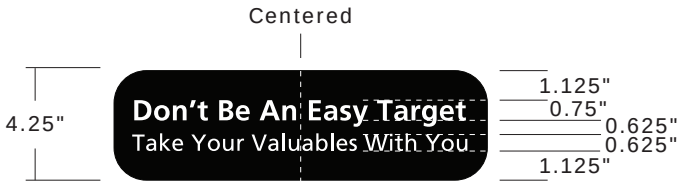
1-line message example

3-line message example

Scale: 1" = 1'- 0"	
Sign type: PARK-L	

Standard layout - Medium

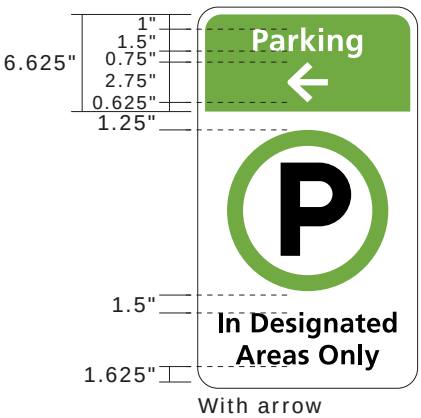




Variations

1-line message example

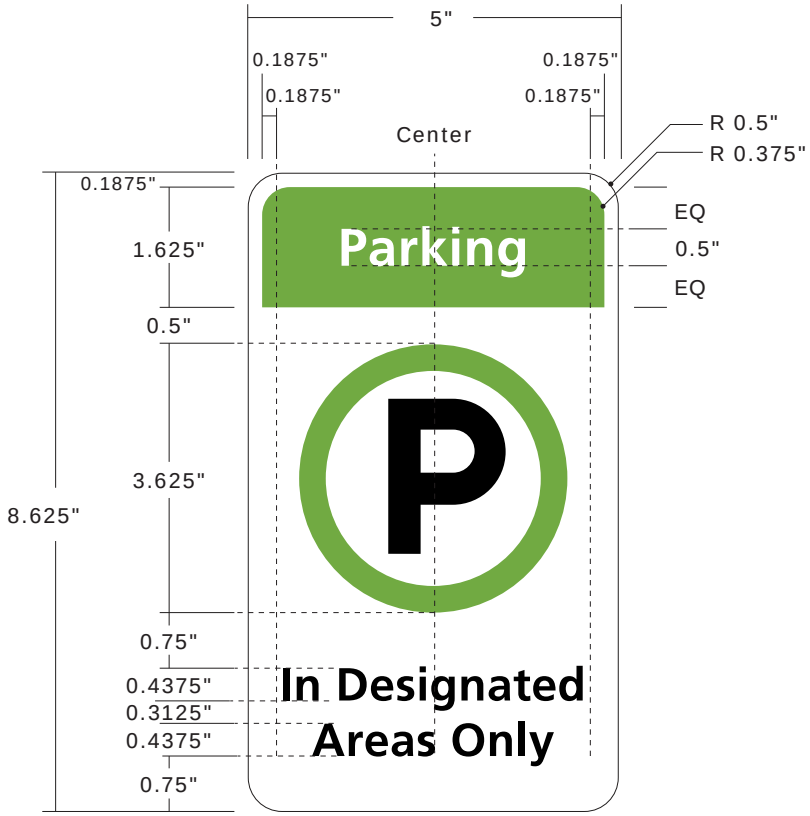
3-line message example

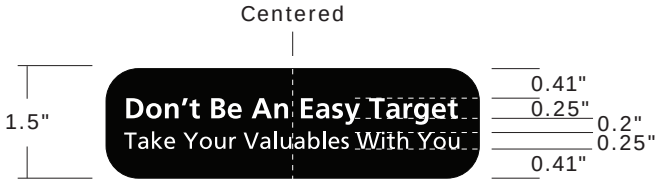


With arrow

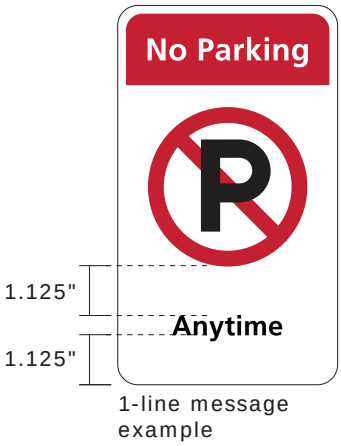
Scale: 1.5" = 1'- 0"
Sign type: PARK-M

Standard layout - Small



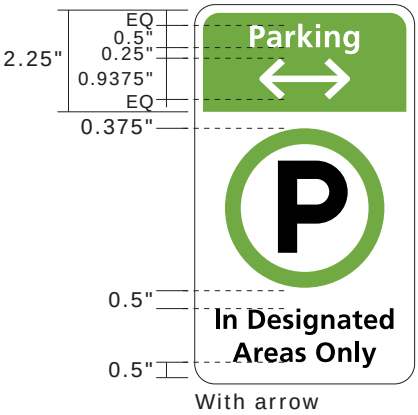


Variations



1-line message example

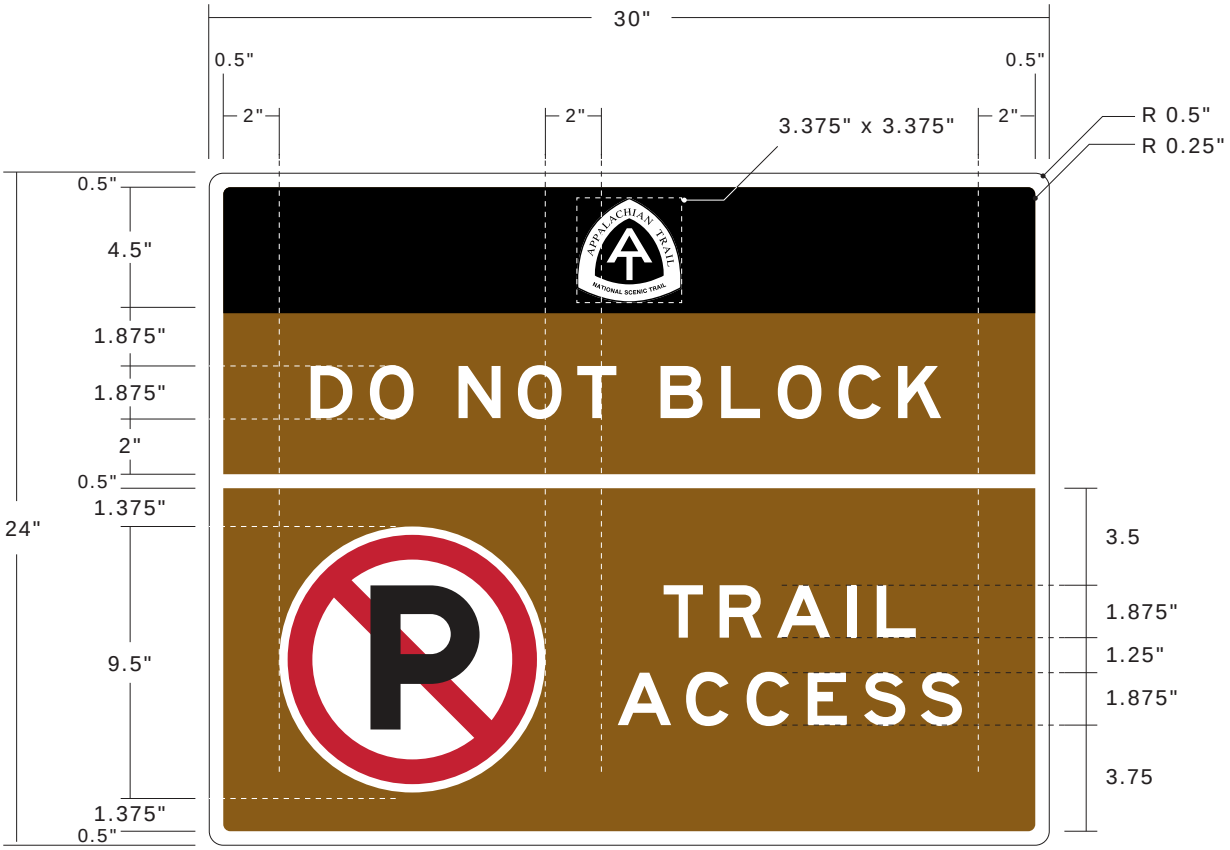
3-line message example



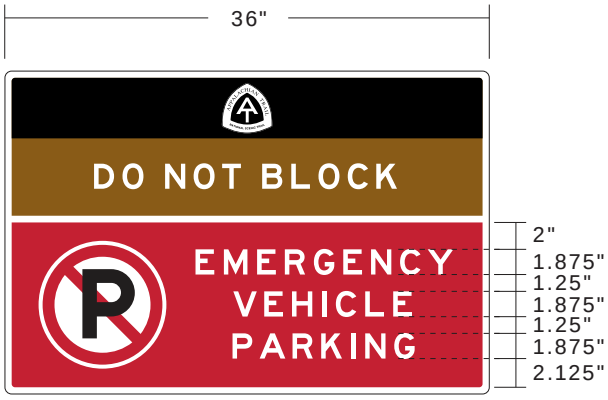
With arrow

Scale: 4.625" = 1'- 0"	
Sign type: PARK-S	

Standard layout



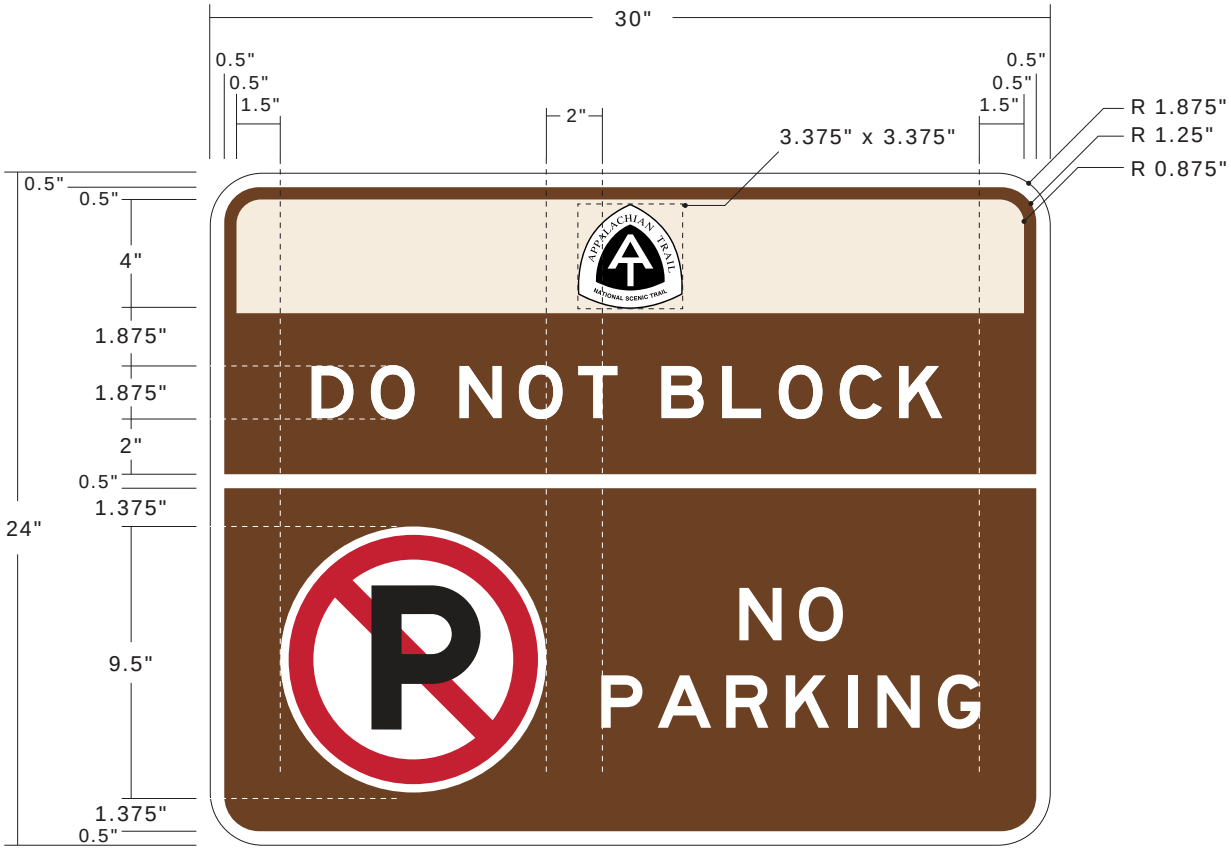
Variations



3-line message, wider, color

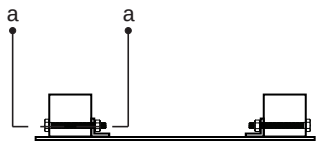
Scale: 1.75" = 1'- 0"
Sign type: PARK-G

Alternate U.S. Forest Service compatible styling

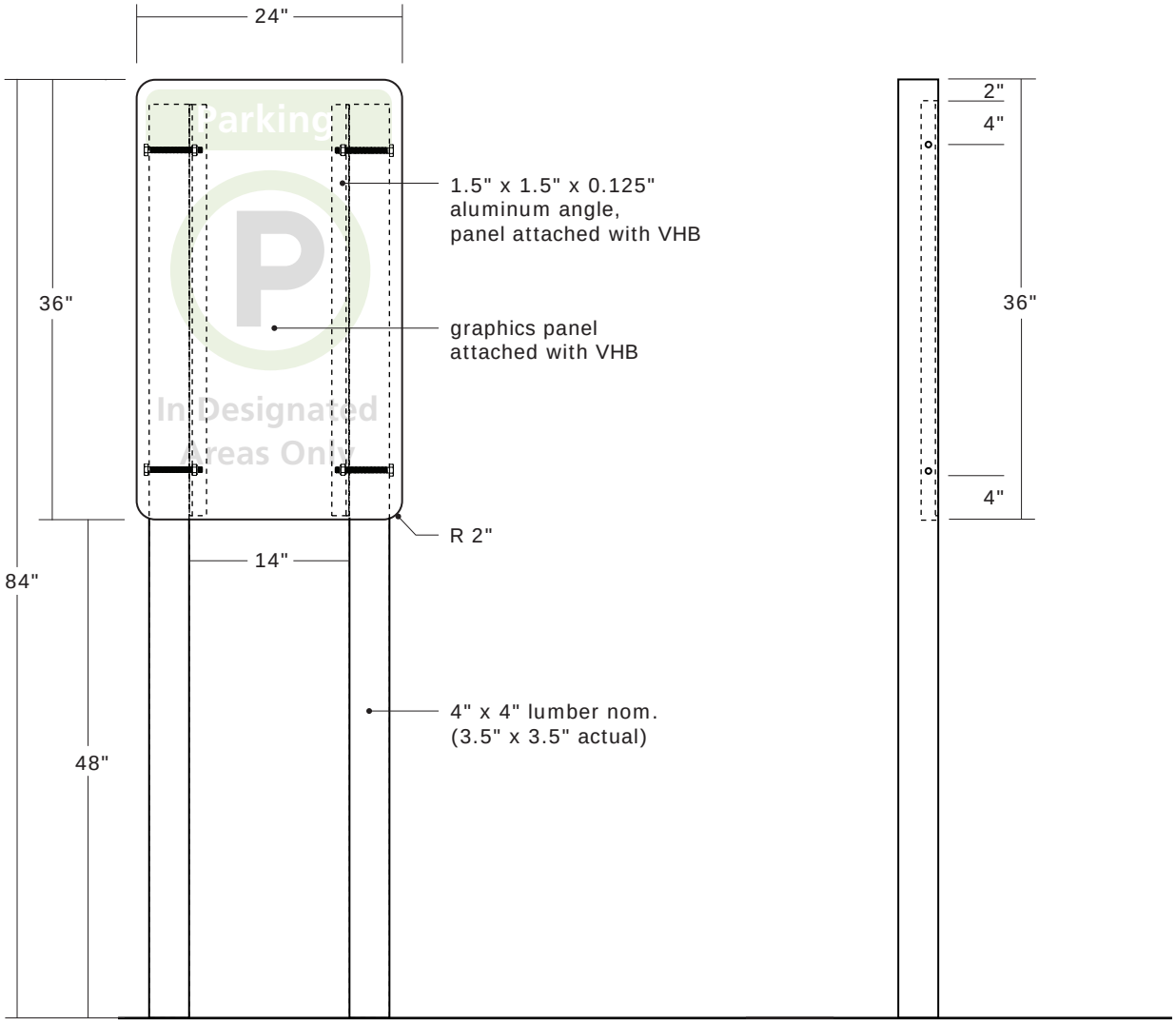


Scale: 1.75" = 1'- 0"
Sign type: PARK-G

Wood Post with Angle Attachment



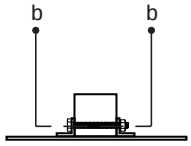
Plan View



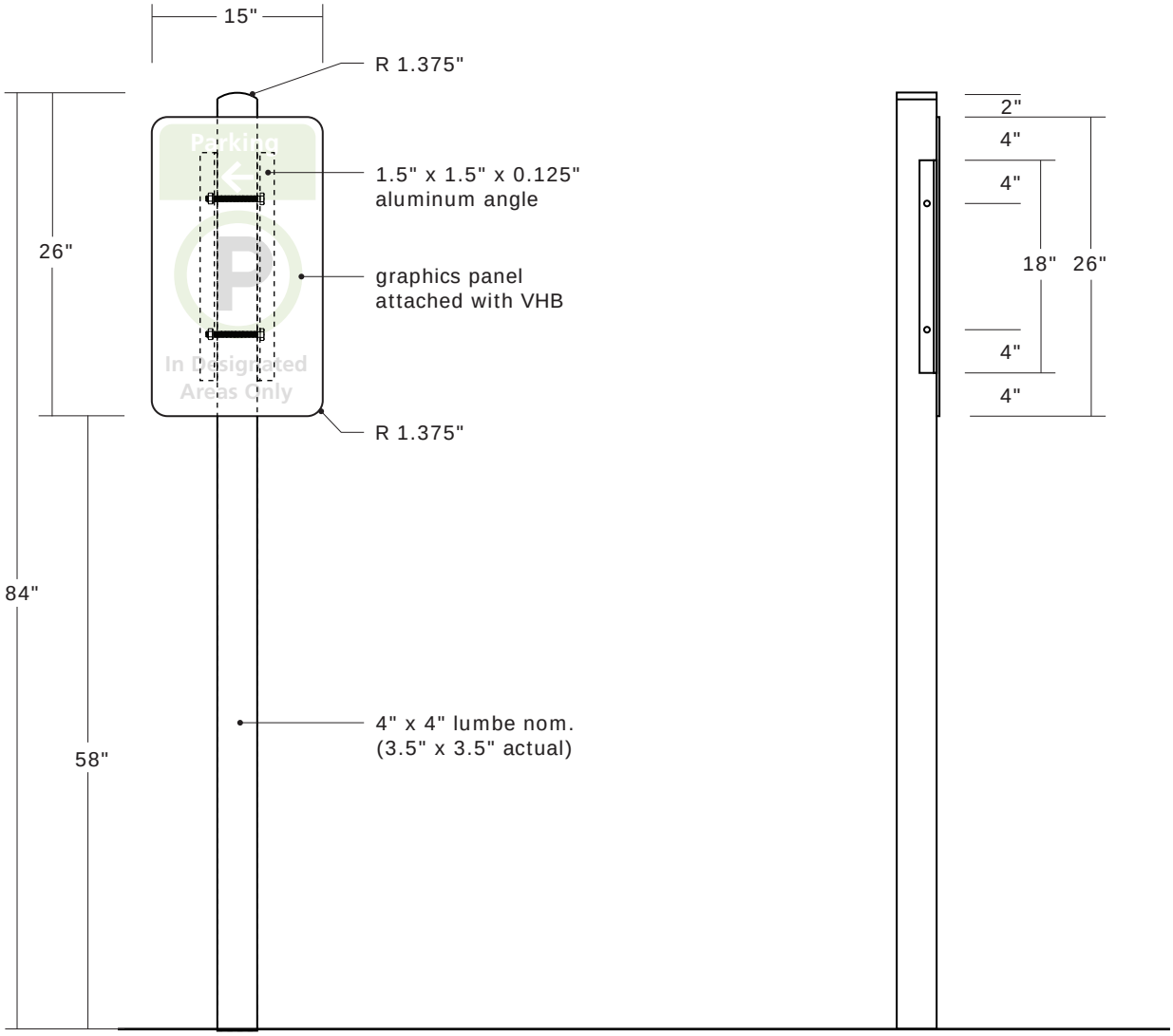
Front View **Side View**

Scale: 0.75" = 1' - 0"
Sign type: PARK-L

Wood Post with Angle Attachment



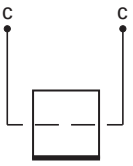
Plan View



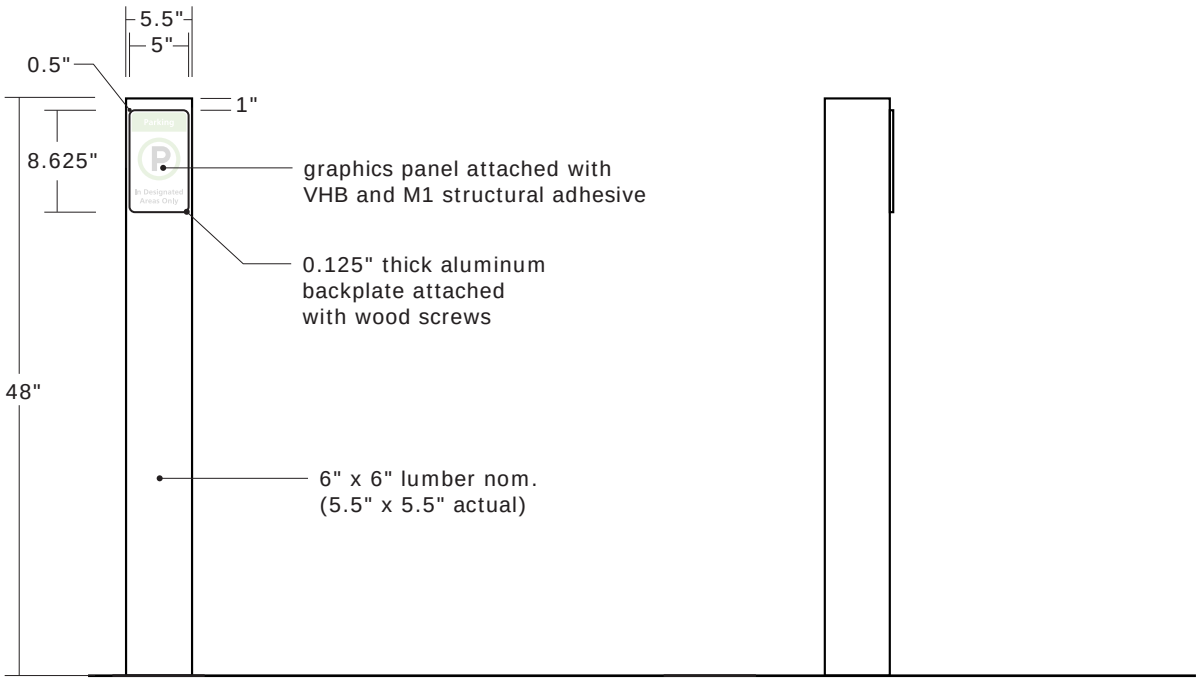
Front View **Side View**

Scale: 0.75" = 1' - 0"
Sign type: PARK-M

Wood Post with Backplate Attachment

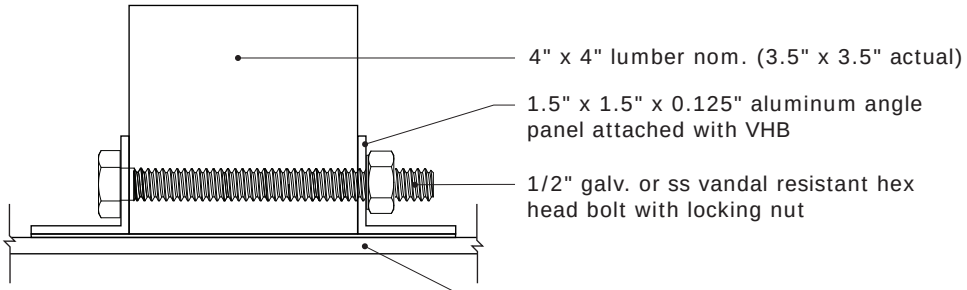


Plan View

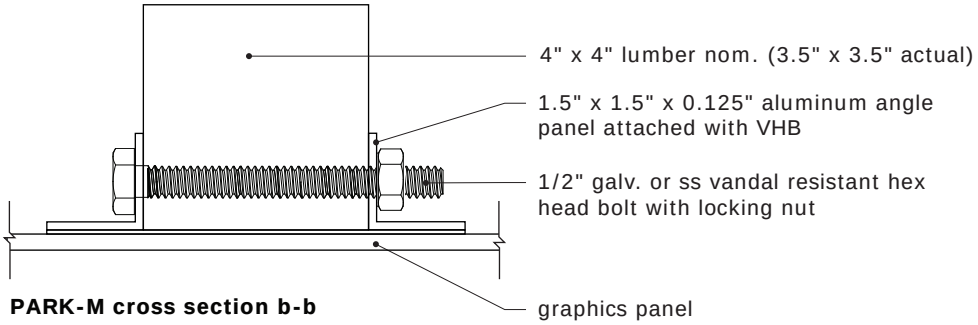


Front View **Side View**

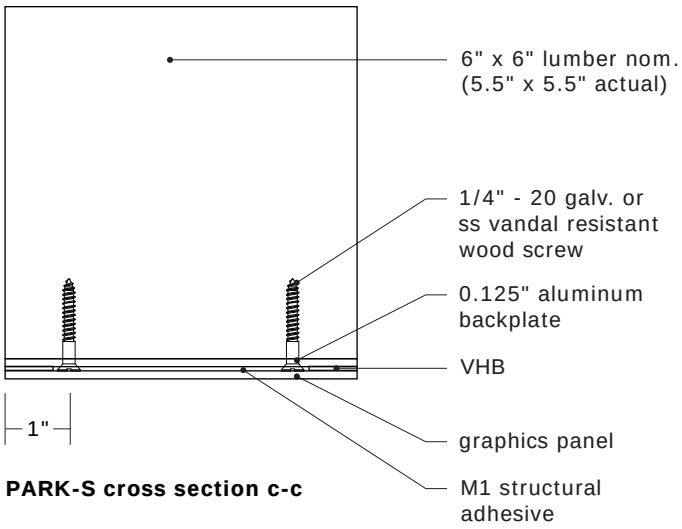
Scale: 0.75" = 1' - 0"
Sign type: PARK-S



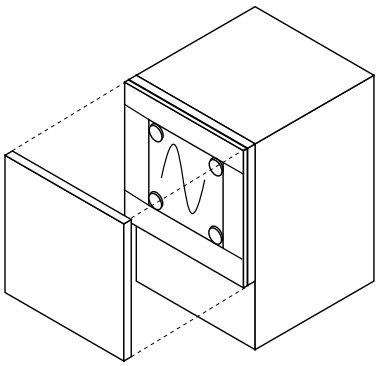
PARK-L cross section a-a



PARK-M cross section b-b



PARK-S cross section c-c

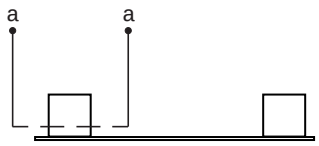


Isometric View
Not to scale

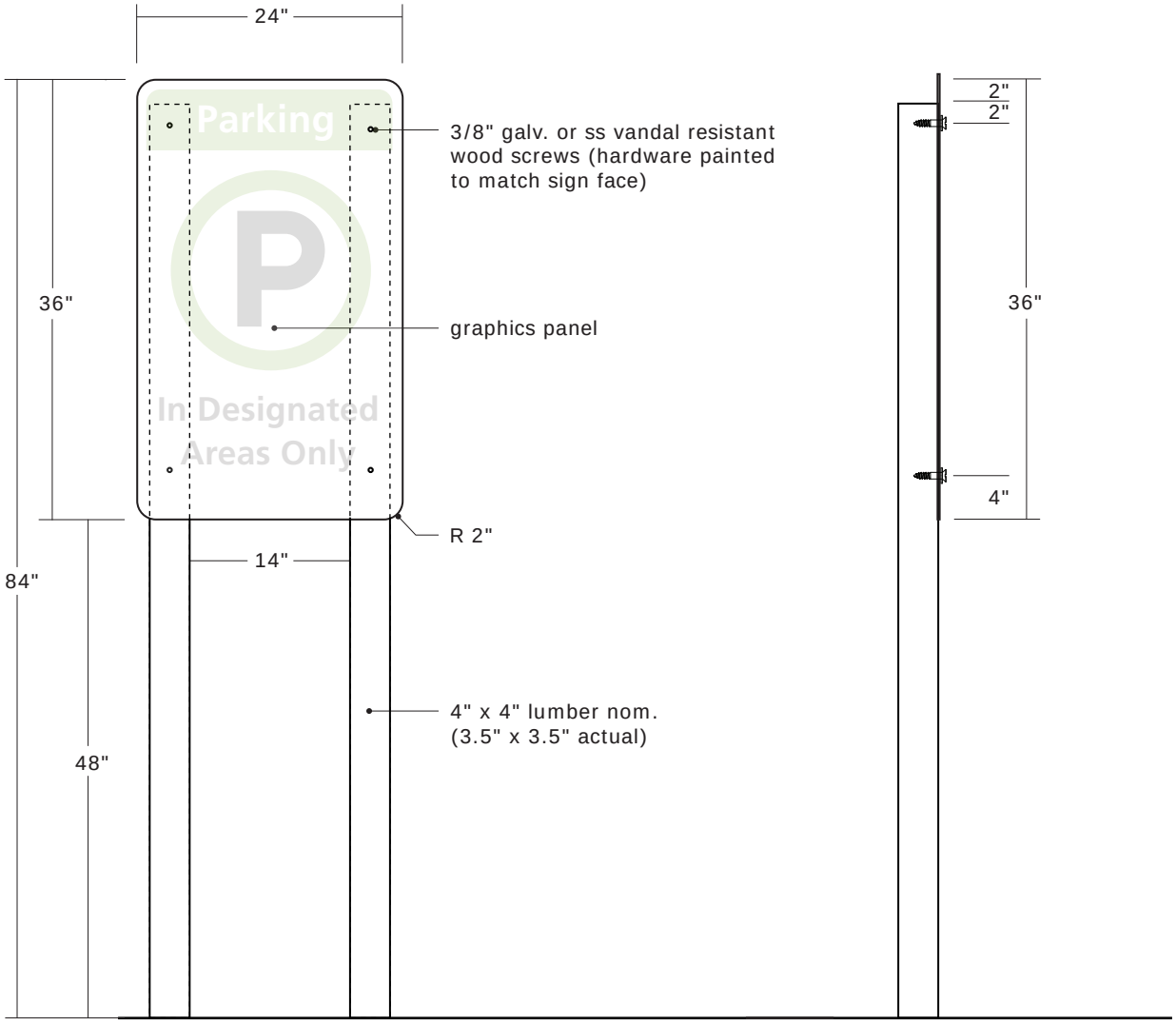
0.125" thick aluminum backplate attached to post with wood screws, VHB applied to edges and with M1 applied in the center to attach the 0.125" thick graphics panel

Scale: 1:3
Sign type: PARK

Wood Post Attached Through Sign Face



Plan View

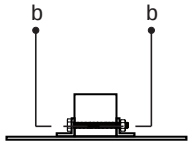


Front View **Side View**

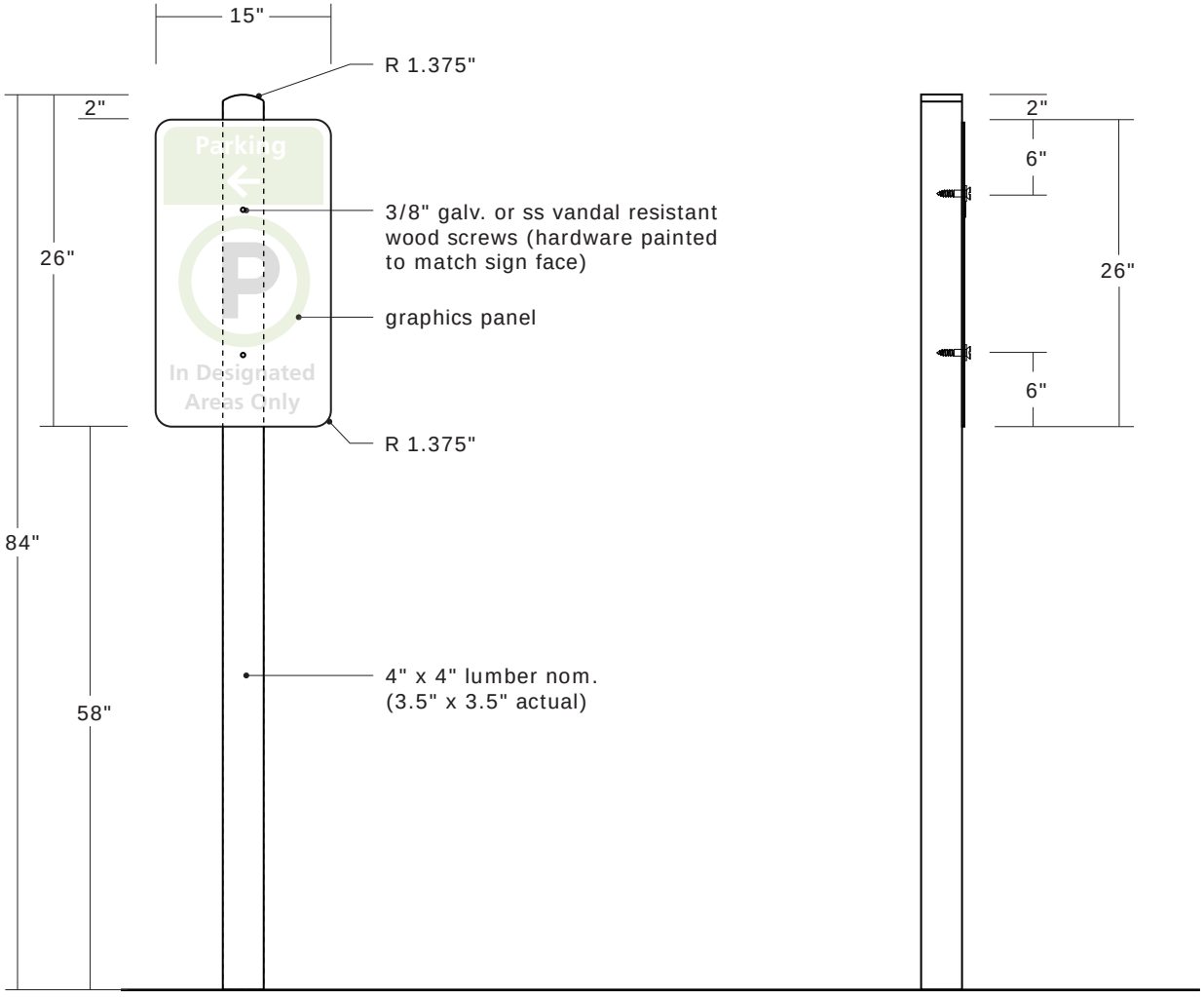
*Hardware should be placed to avoid graphics on sign face.

Scale: 0.75" = 1' - 0"
Sign type: PARK-L

Wood Post Attached Through Sign Face



Plan View

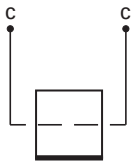


Front View **Side View**

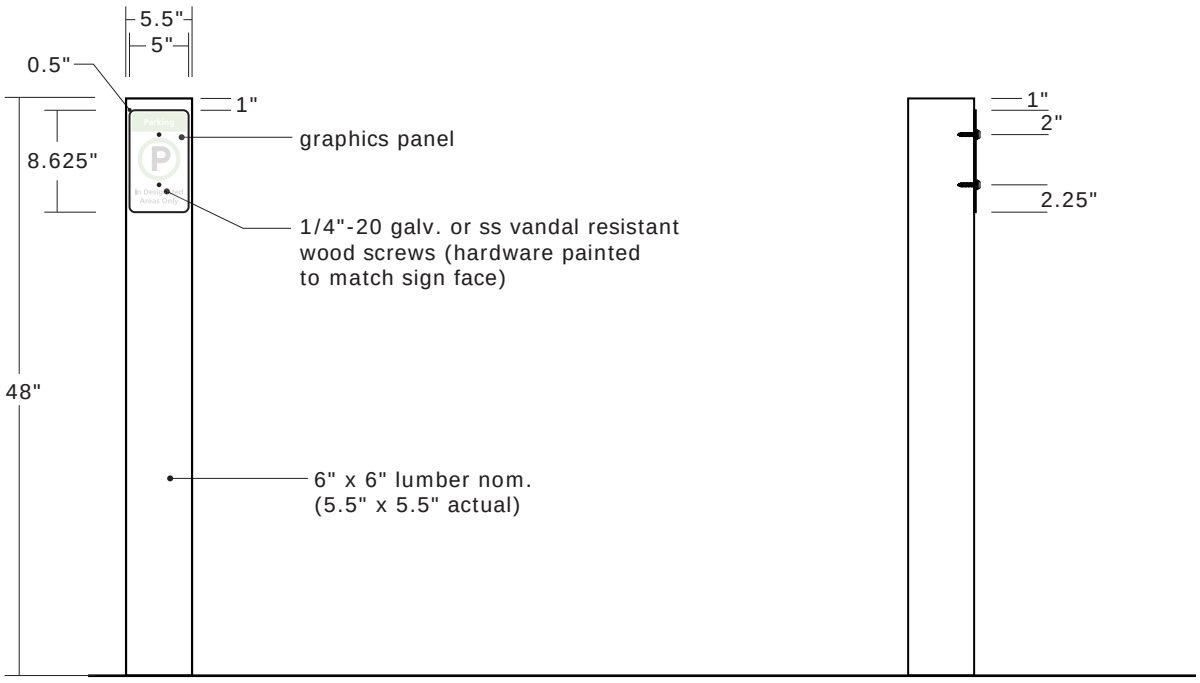
*Hardware should be placed to avoid graphics on sign face.

Scale: 0.75" = 1' - 0"
Sign type: PARK-M

Wood Post Attached Through Sign Face



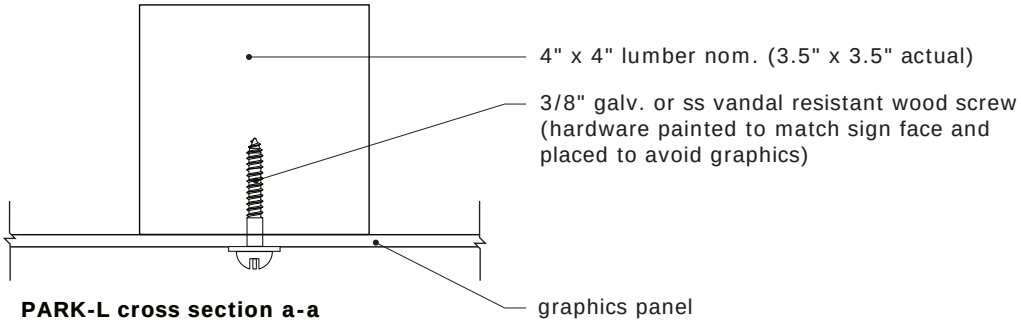
Plan View



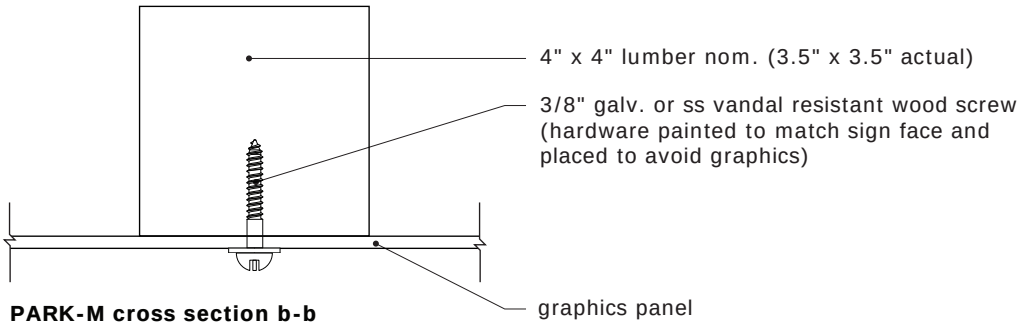
Front View **Side View**

*Hardware should be placed to avoid graphics on sign face.

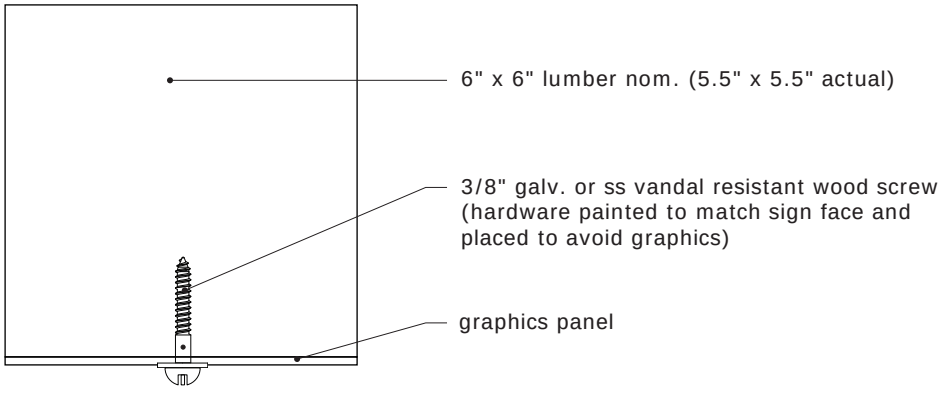
Scale: 0.75" = 1' - 0"
Sign type: PARK-S



PARK-L cross section a-a

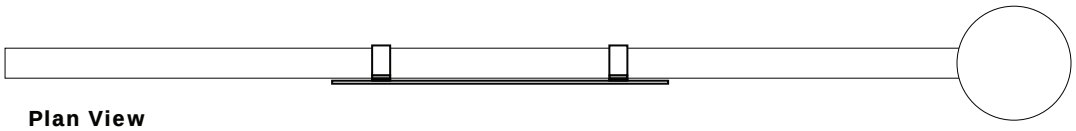


PARK-M cross section b-b

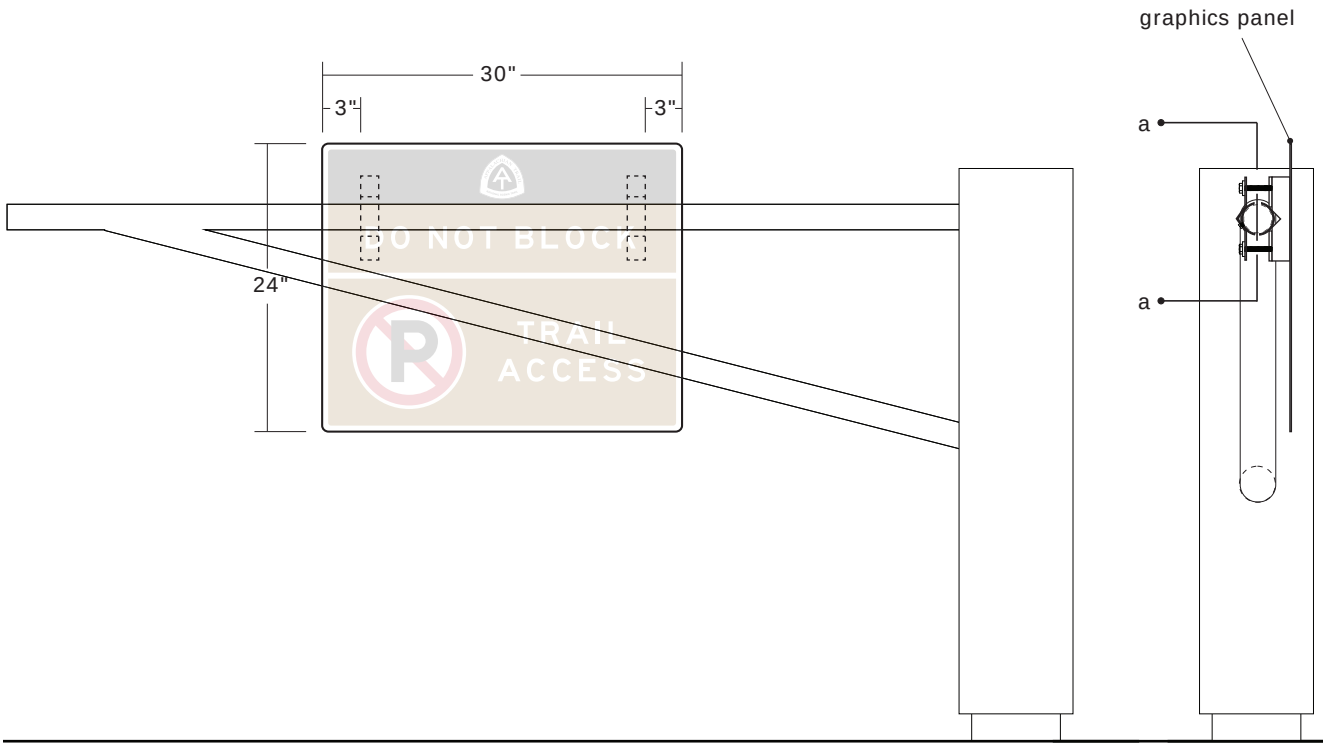


PARK-S cross section c-c

Scale: 1:3
Sign type: PARK

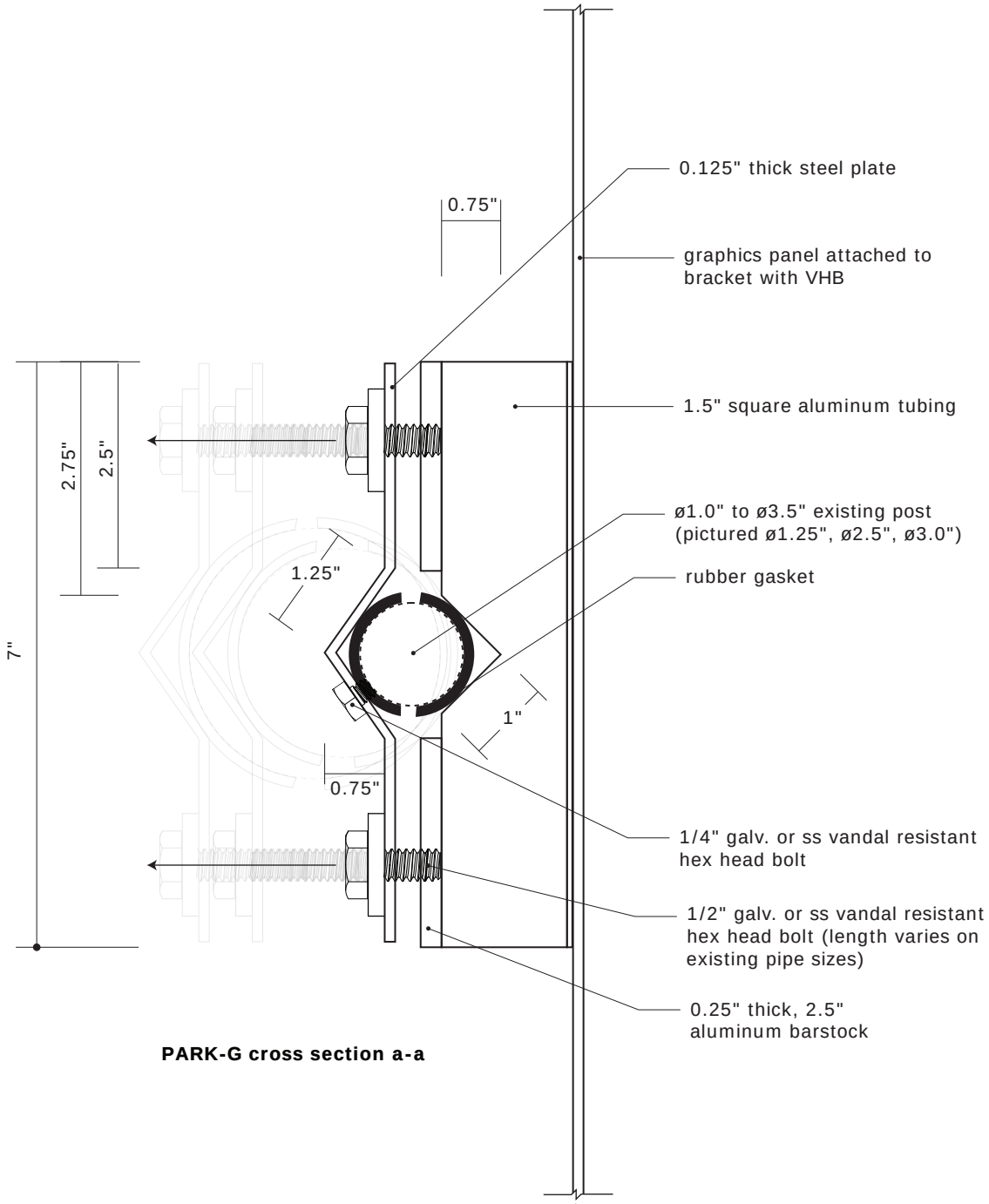


Plan View



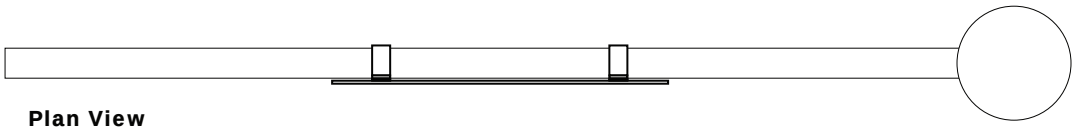
Front View **Side View**

Scale: 0.75" = 1' - 0"
Sign type: PARK-G

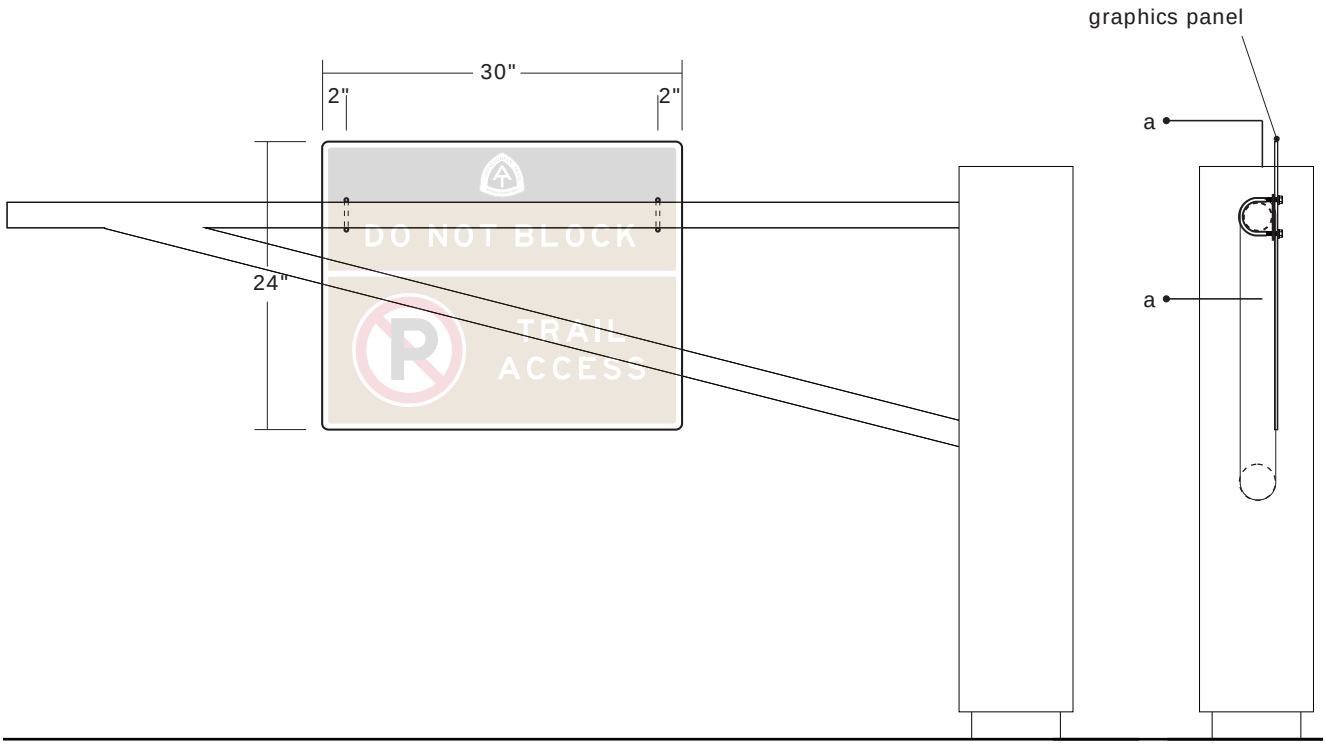


PARK-G cross section a-a

Scale: 1:2
Sign type: PARK-G



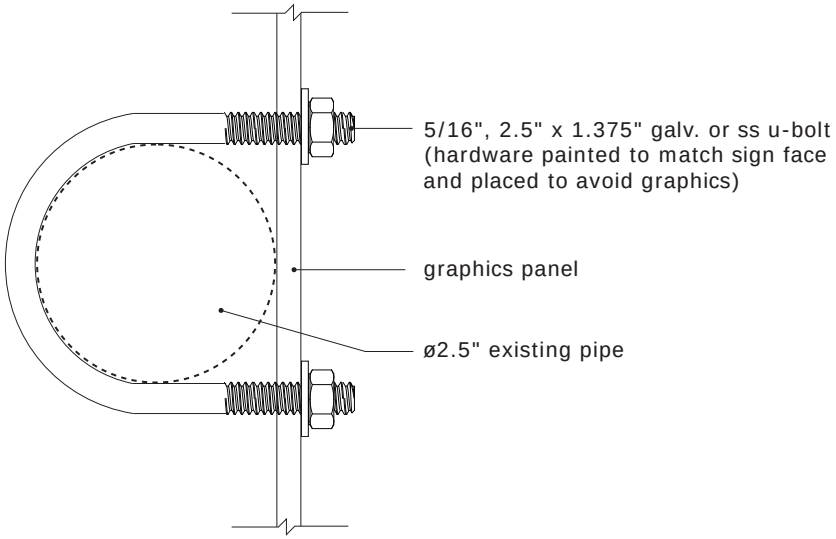
Plan View



Front View

Side View

Scale: 0.75" = 1' - 0"
Sign type: PARK-G



PARK-G cross section b-b

Scale: 1:2
Sign type: PARK-G

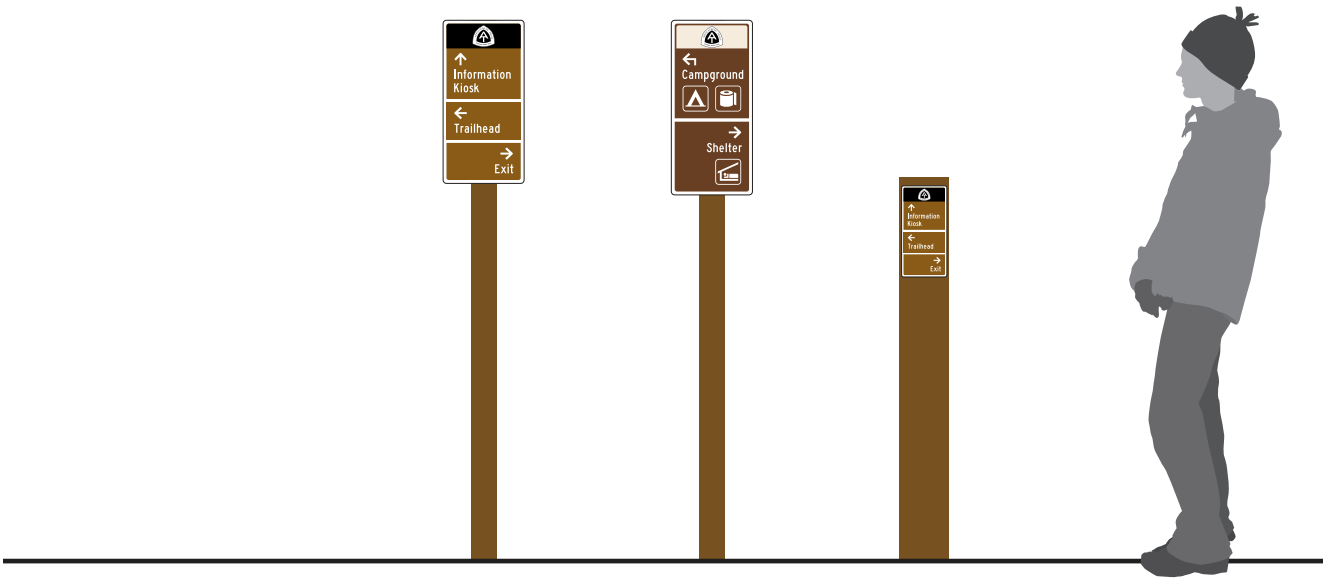
PEDD Pedestrian Directional

Pedestrian Directional signs are primarily intended to direct pedestrians from their vehicles to the trailhead, and back again.

Directional messages are grouped by direction and organized according to standard wayfinding principles:

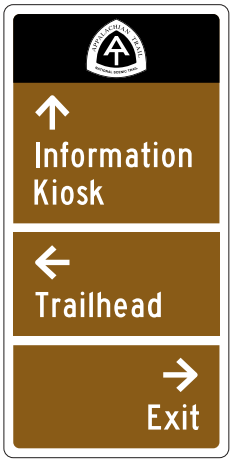
1. Direction (straight/up, left, right)
2. Distance (closest to furthest)
3. Alphabetical

There are two color schemes shown. The brown sign with the black header is the standard and will be used at all NPS and partner sites. The brown sign with the ivory header is an alternate USFS compatible style that may only be used at USFS sites. See page 4.3 for exact color specifications.



Scale: 9/16" = 1'- 0"
Sign type: PEDD

Example 1
Multiple message in one direction

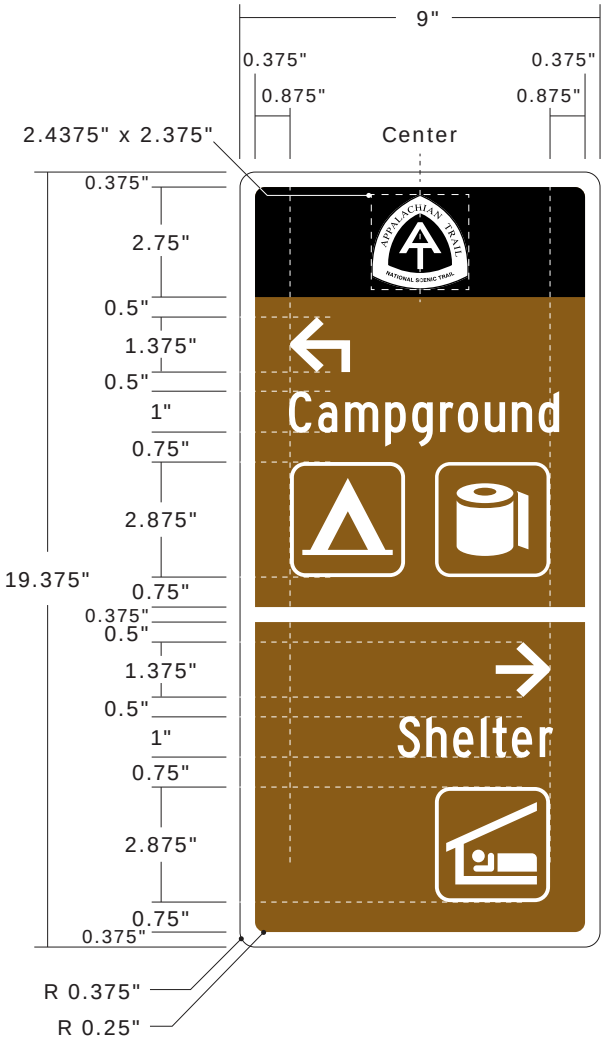


Example 2
Multiple directions

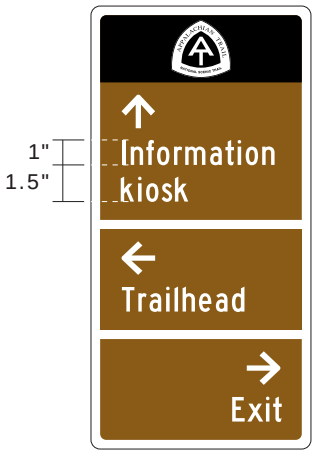
Example 3
With symbols

Example 4
Alternate U.S. Forest Service compatible styling

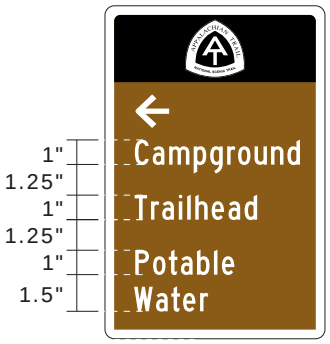
Standard layout



Variations



2-line message

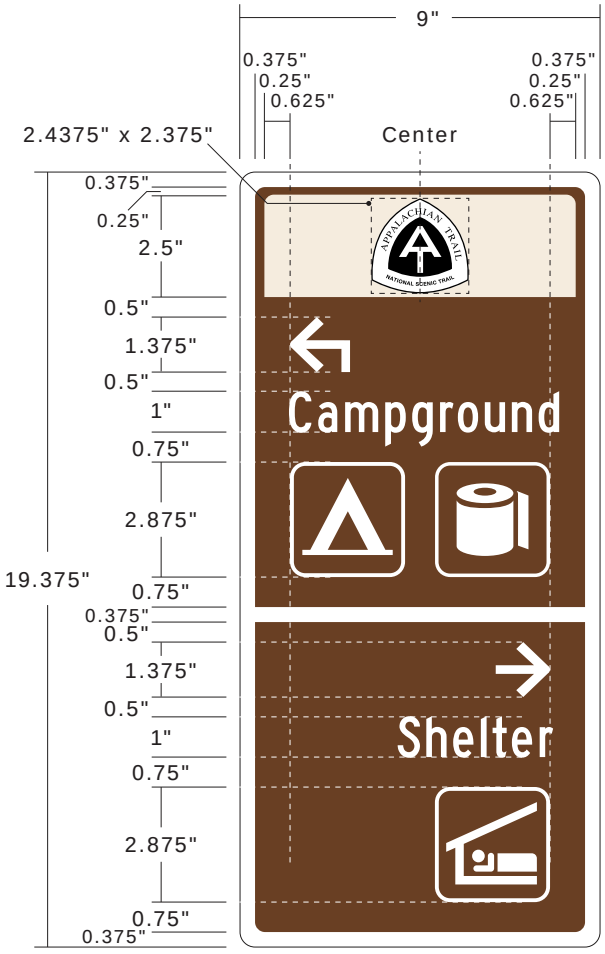


Muliple destinations in one direction

1 Height may vary depending on length of legend. Maximum height is 24".

Scale: 2.5" = 1'- 0"
Sign type: PEDD

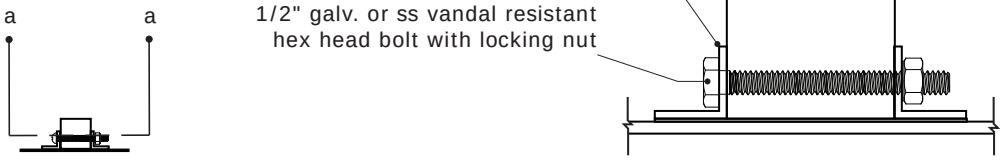
Alternate U.S. Forest Service compatible styling



1 Height may vary depending on length of legend. Maximum height is 24".

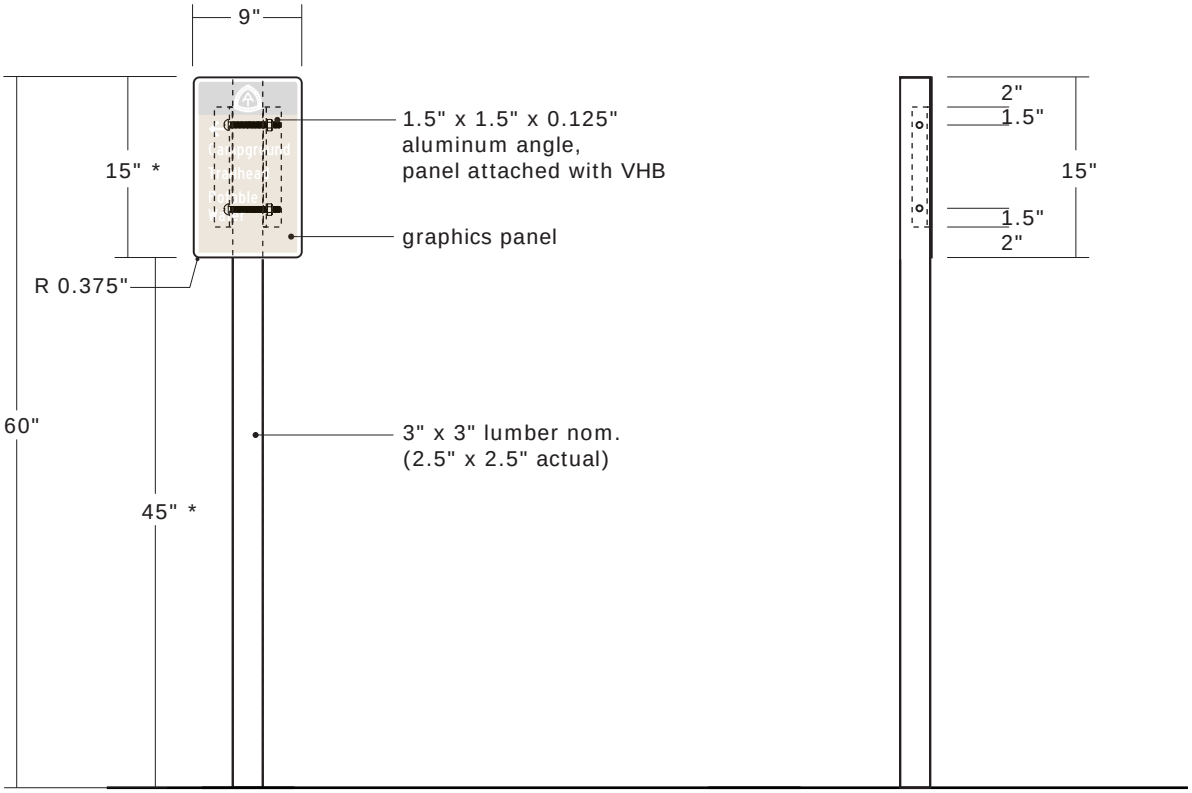
Scale: 2.5" = 1'- 0"
Sign type: PEDD

Wood Post with Angle Attachment



Plan View

PEDD cross section a-a
Not to scale

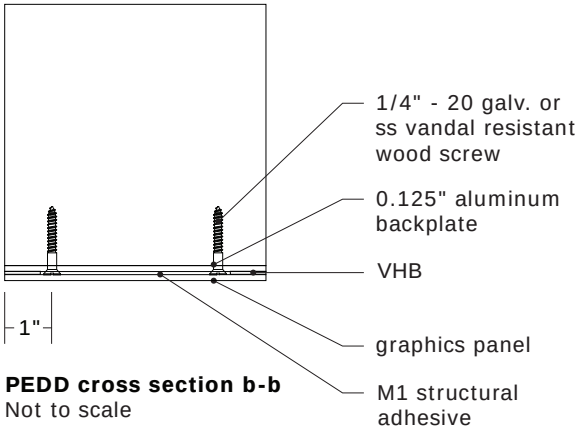


Front View **Side View**

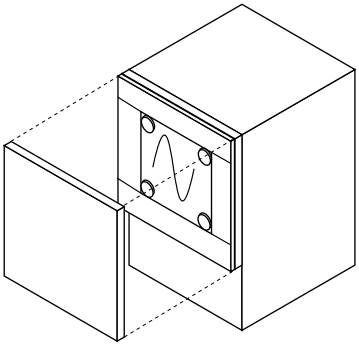
*Clearance below sign will vary based on height of panel

Scale: 0.75" = 1' - 0"
Sign type: PEDD

Wood Post with Backplate Attachment

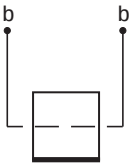


PEDD cross section b-b
Not to scale

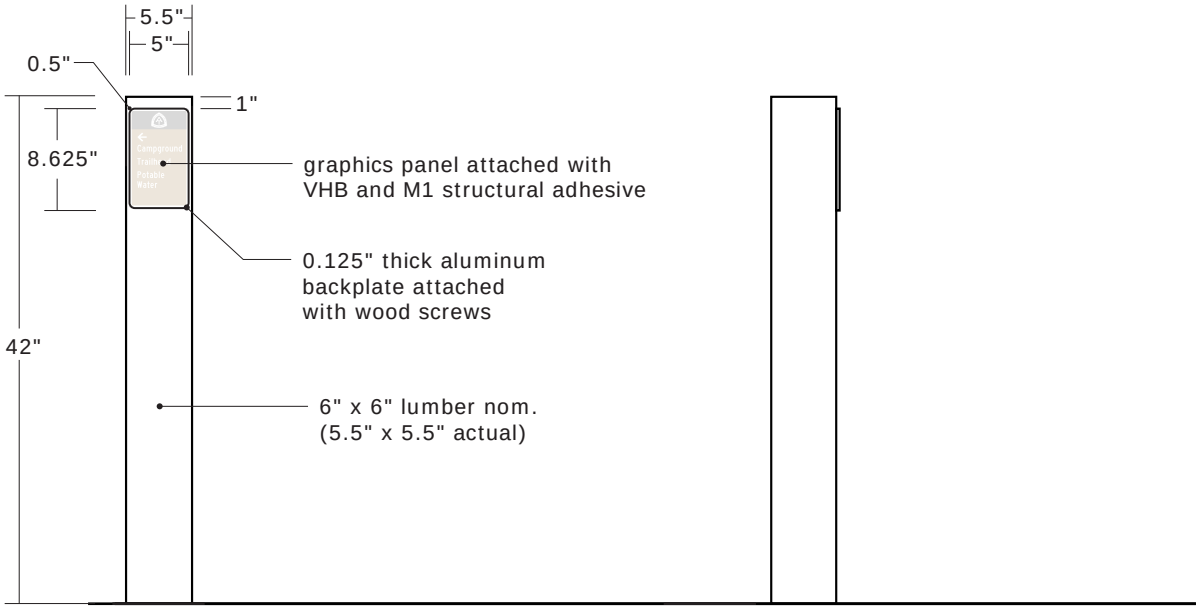


Isometric View
Not to scale

0.125" thick aluminum backplate attached to post with wood screws, VHB applied to edges and with M1 applied in the center to attach the 0.125" thick graphics panel



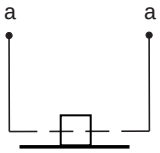
Plan View



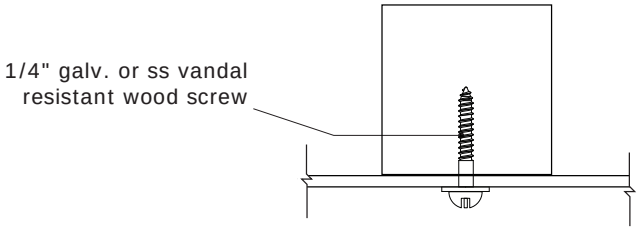
Front View **Side View**

Scale: 0.75" = 1' - 0"
Sign type: PEDD

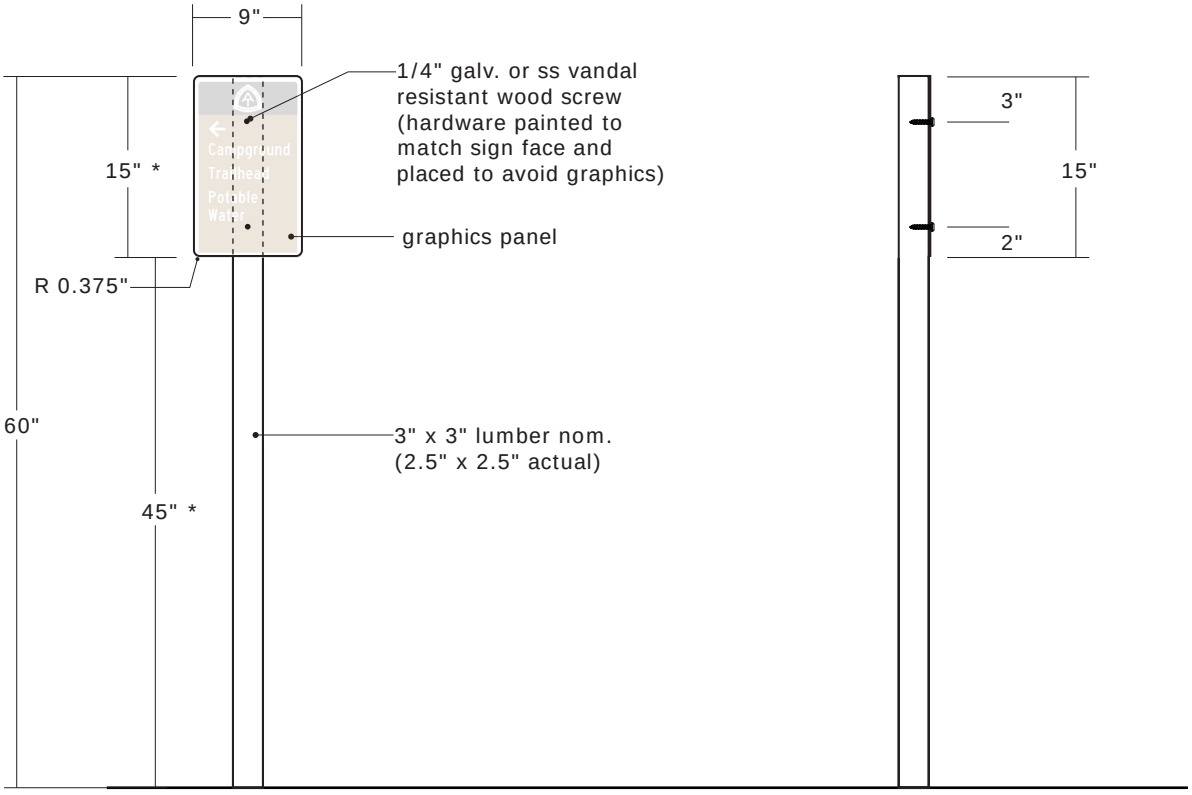
Wood Post Attached Through Sign Face



Plan View



PEDD cross section a-a
Not to scale

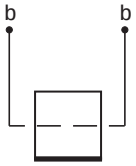


Front View **Side View**

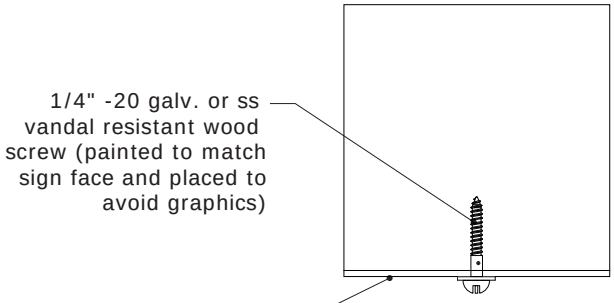
*Clearance below sign will vary based on height of panel

Scale: 0.75" = 1' - 0"
Sign type: PEDD

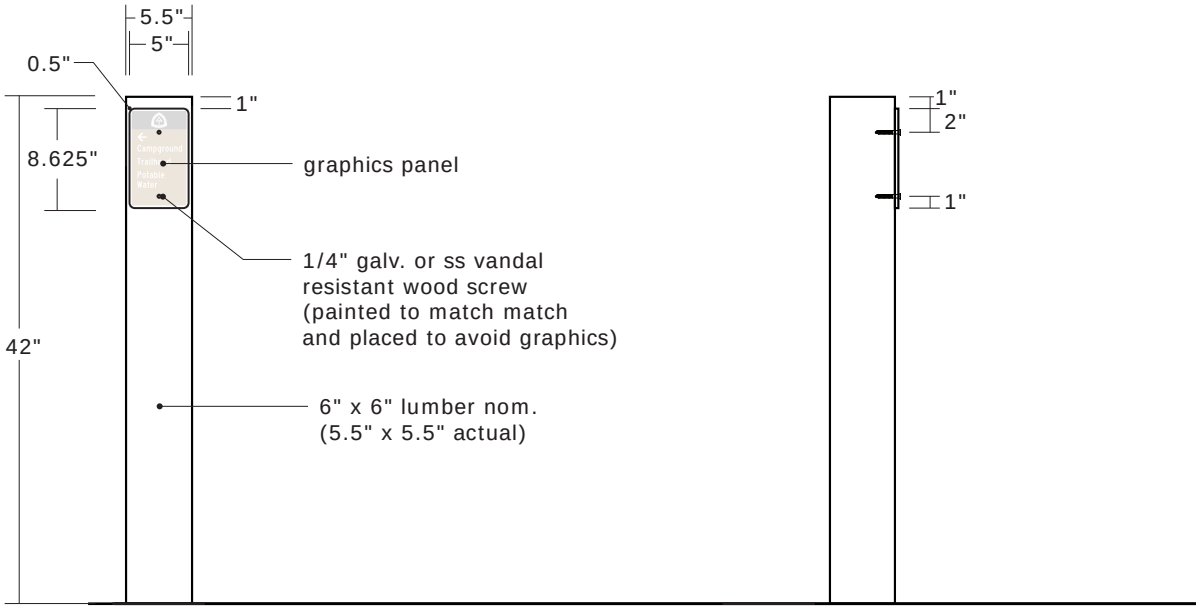
Wood Post with Backplate Attachment



Plan View



PEDD cross section b-b
Not to scale



Front View **Side View**

Scale: 0.75" = 1' - 0"
Sign type: PEDD

INFO Information Kiosk

Information Kiosks are an opportunity to educate and inform visitors. Exhibit panels may contain information on:

- Overview of the Appalachian National Scenic Trail with a map
- Information about the local area with a regional map
- Rules and regulations
- Safety information
- Leave No Trace messaging
- Bulletin board for posting notices

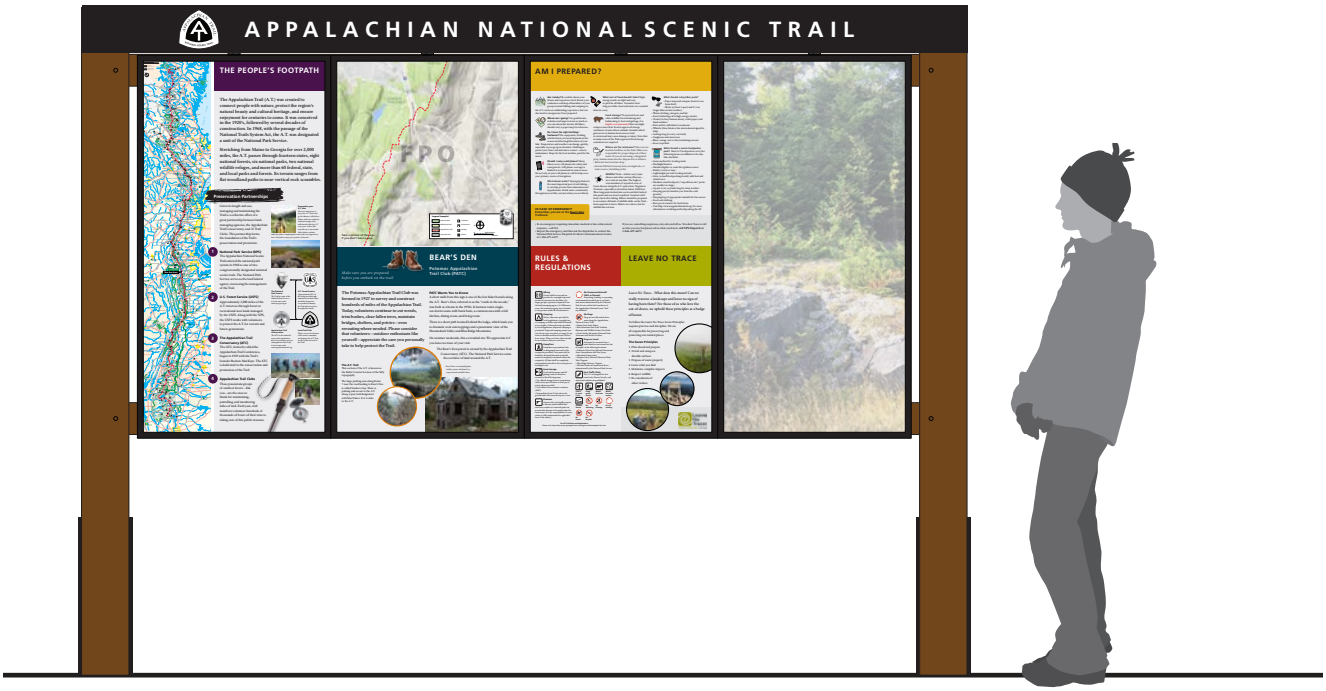
These structures should be located in highly-visible, high-traffic areas.

There are a number of size options for the kiosk, as well as options for retrofitting panels to existing kiosks.

The layouts shown in this section are available as templates via the NPS Appalachian National Scenic Trail Office.

Bulletin Board Case

The bulletin board case is a lockable aluminum case with a Lexan window. Lexan is a polycarbonate resin thermoplastic. It has an



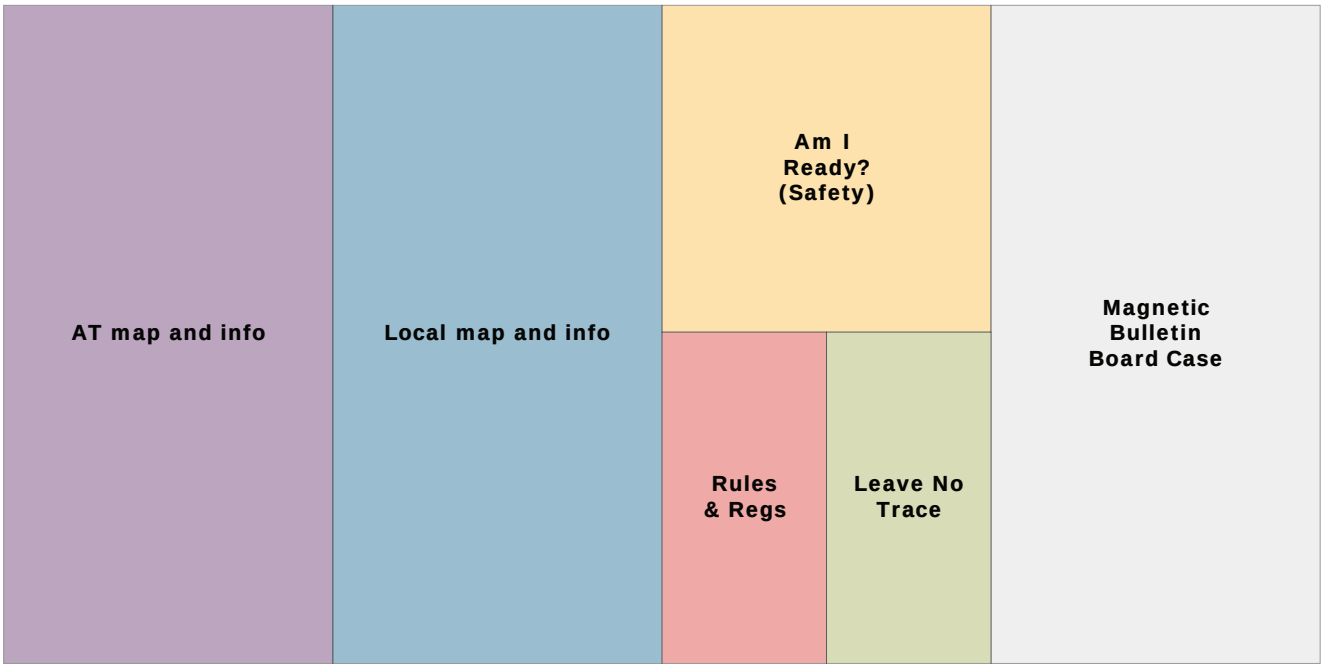
Scale: 0.5" = 1'- 0"
Sign type: INFO

impact strength 250x greater than that of glass and 30x greater than that of acrylic, making it shatterproof (even bullet-resistant). It can also be UV-resistant—so it will not yellow quickly or crack in the sun. The standard backplate of the bulletin board case is steel, which allows magnets to be used to post notices and bulletins. The steel can be wrapped in a vinyl print or can be painted a solid color. A vinyl print allows the bulletin board to have an aesthetic presence even when nothing is posted. A painted surface—when painted with an automotive paint—is highly-resilient and will remain colorfast for decades.

Kiosk Configuration

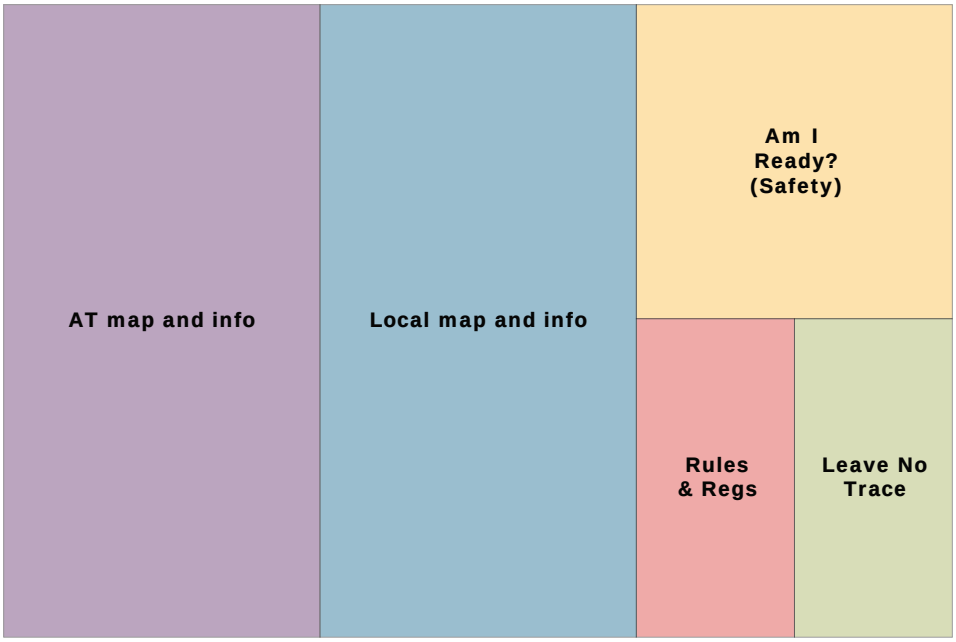
The arrangements on the following pages provide just a few examples of different configurations of information based on available space/size of kiosk.

If the kiosk is large, it will likely be able to fit content from all the categories of information. As space becomes more limited, information will have to be pared down and prioritized depending on what is relevant to the site.

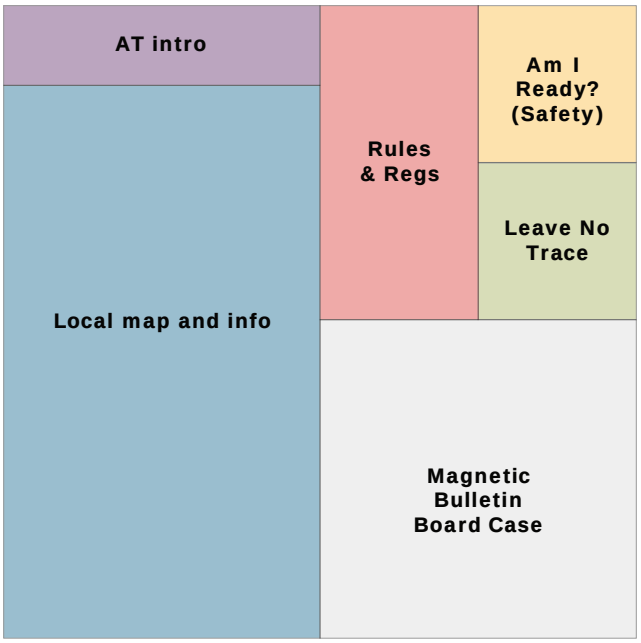


Example 1
4' x 8' large kiosk configuration

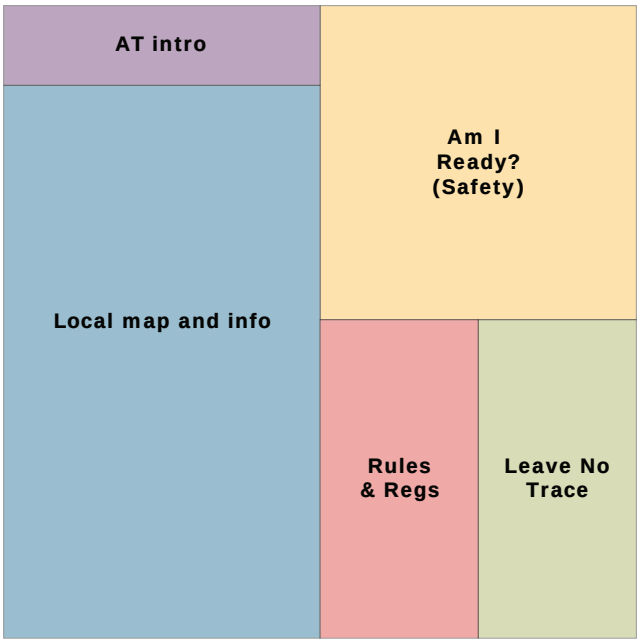
*This configuration is shown in the example on the previous page.



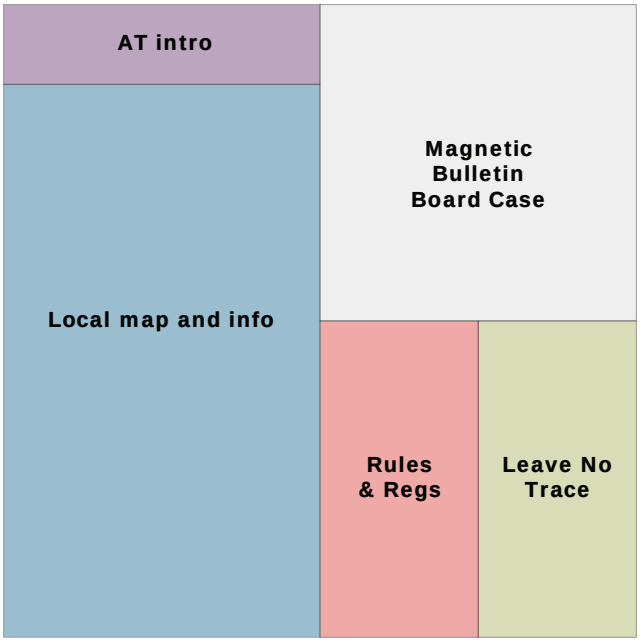
Example 2
4' x 6' large kiosk configuration



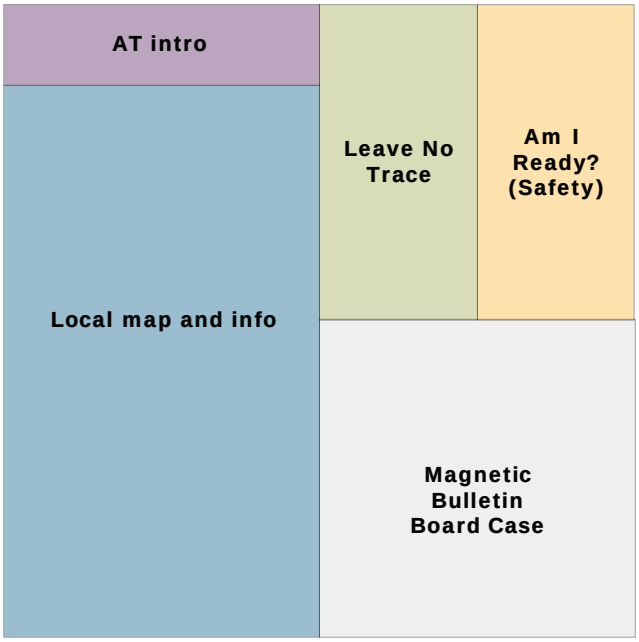
Example 3
4' x 4' medium kiosk configuration



Example 4
4' x 4' medium kiosk configuration

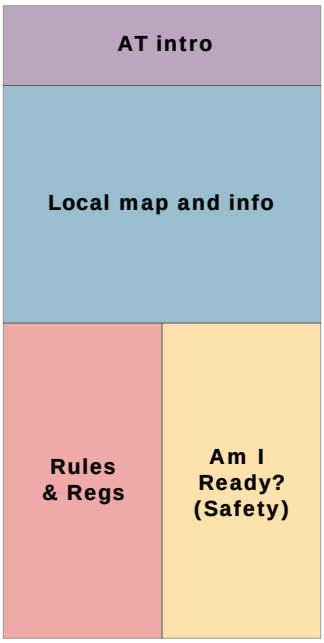


Example 5
4' x 4' medium kiosk configuration

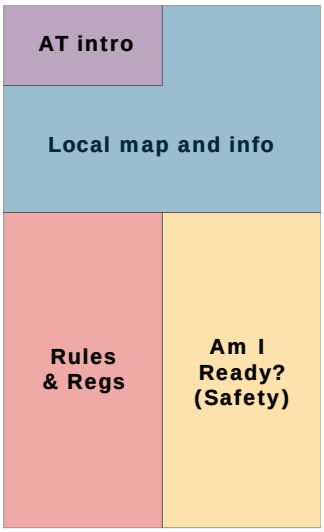


Example 6
4' x 4' medium kiosk configuration

Example 7
2' x 4' small kiosk installation



Example 8
2' x 4' small kiosk installation



Example 9
2' x 3' small kiosk installation

Kiosk Configuration

There may be times when you wish to retrofit an existing kiosk that does not precisely fit the standard panel sizes proposed in this manual.

There are some simple ways to compensate for this extra space without having to resize and redesign panels or replace the kiosk structure.

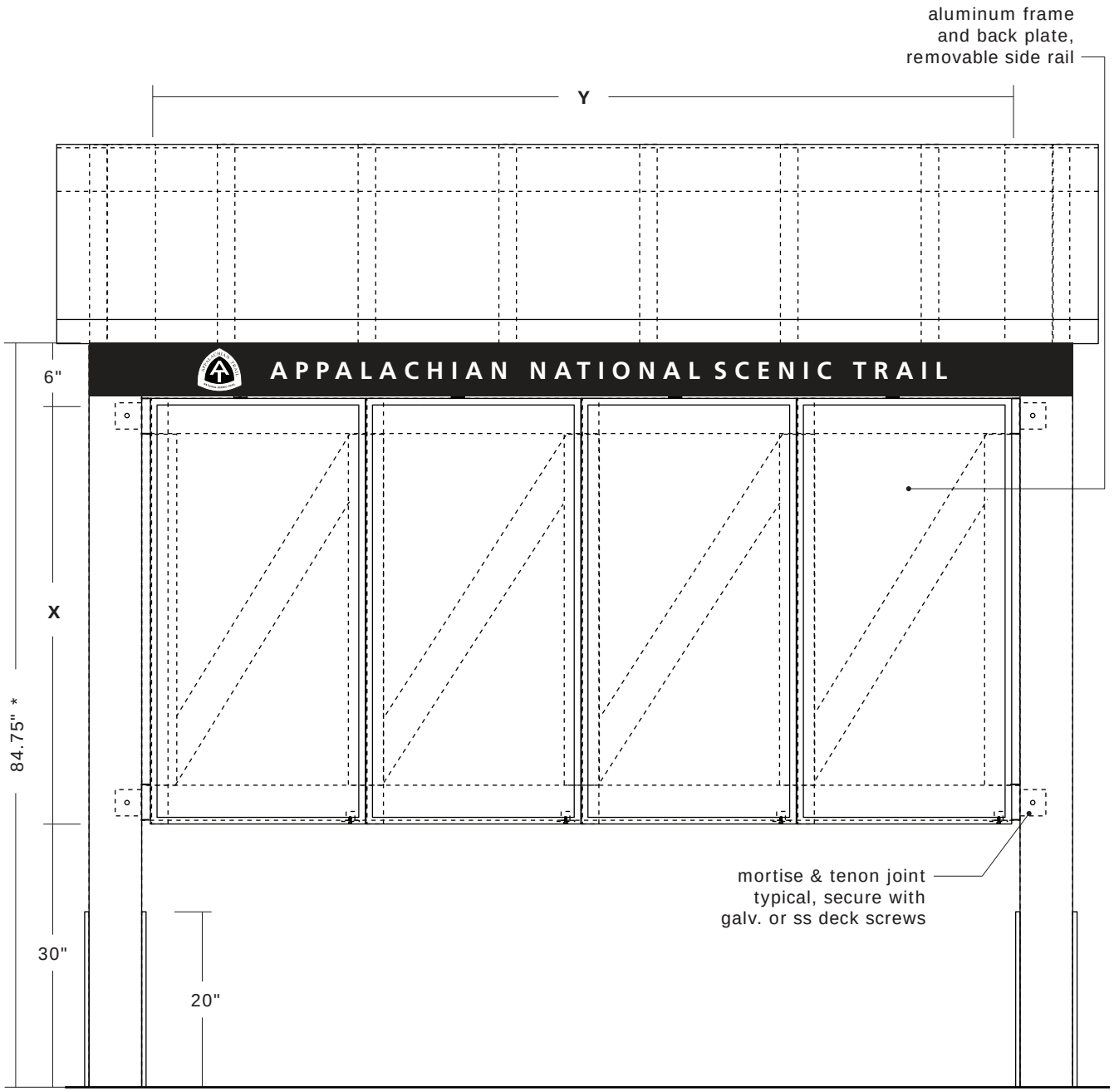
Example 1
Existing 63" x 48" kiosk

This is an example of a kiosk where there is extra space on the side. A simple way to fill this space would be to add a magnetic bulletin board at that exact size. Bulletin boards can be made in custom sizes.

Example 2
Existing 72" x 56" kiosk

This is an example of a kiosk where there is extra space at the top. A simple way to fill this space would be to add a header. The header could be scaled and fabricated in any size and in the same material as the exhibit panels.

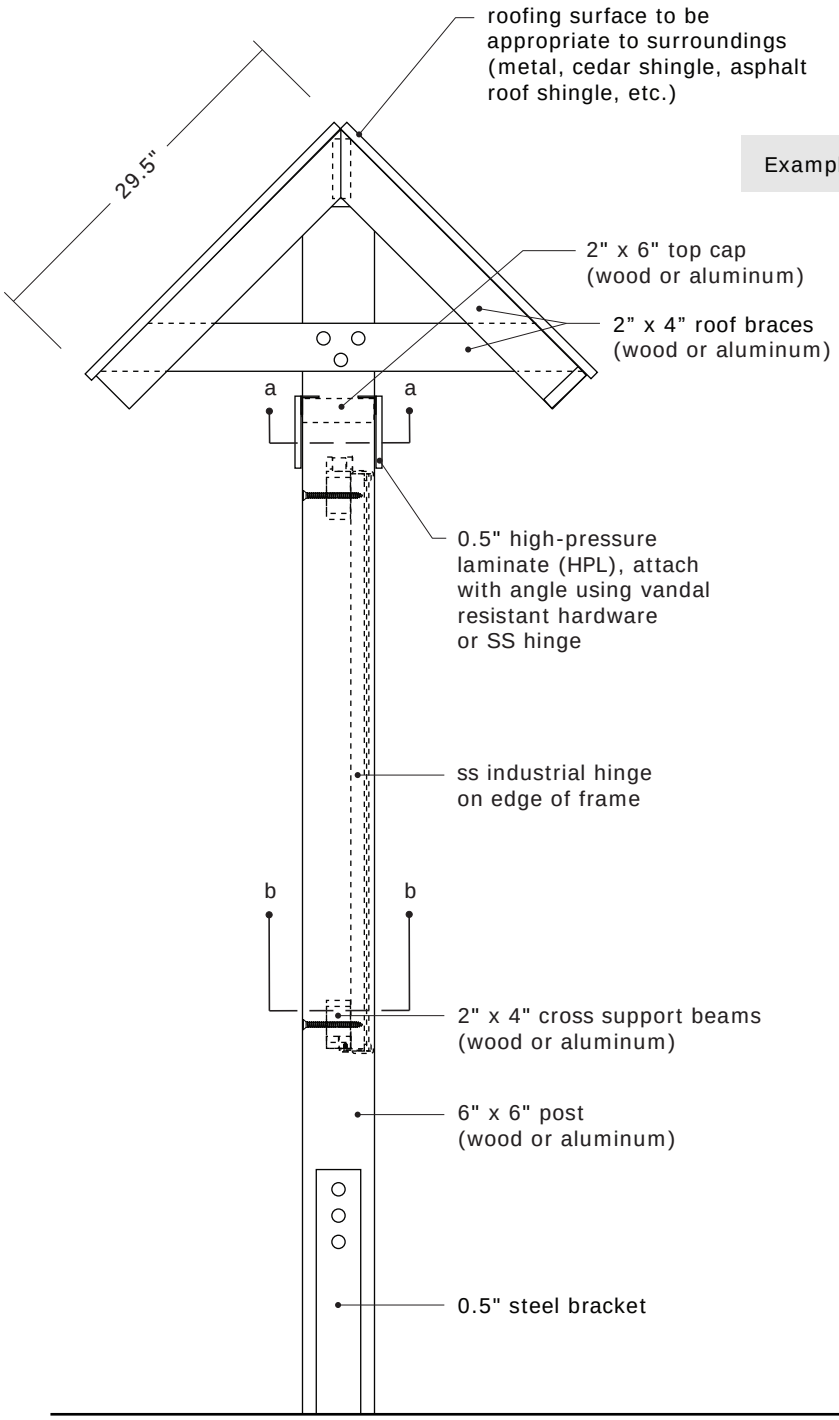
Information Kiosk, Aluminum or Wood, Large, With Roof



Front View

*Total height will vary based on height of panels

Scale: 0.66" = 1' - 0"
Sign type: INFO-L



Kiosk dimensions		
	X	**Y**
	3 feet	6 feet
Example shown	4 feet	8 feet*
	5 feet	10 feet*

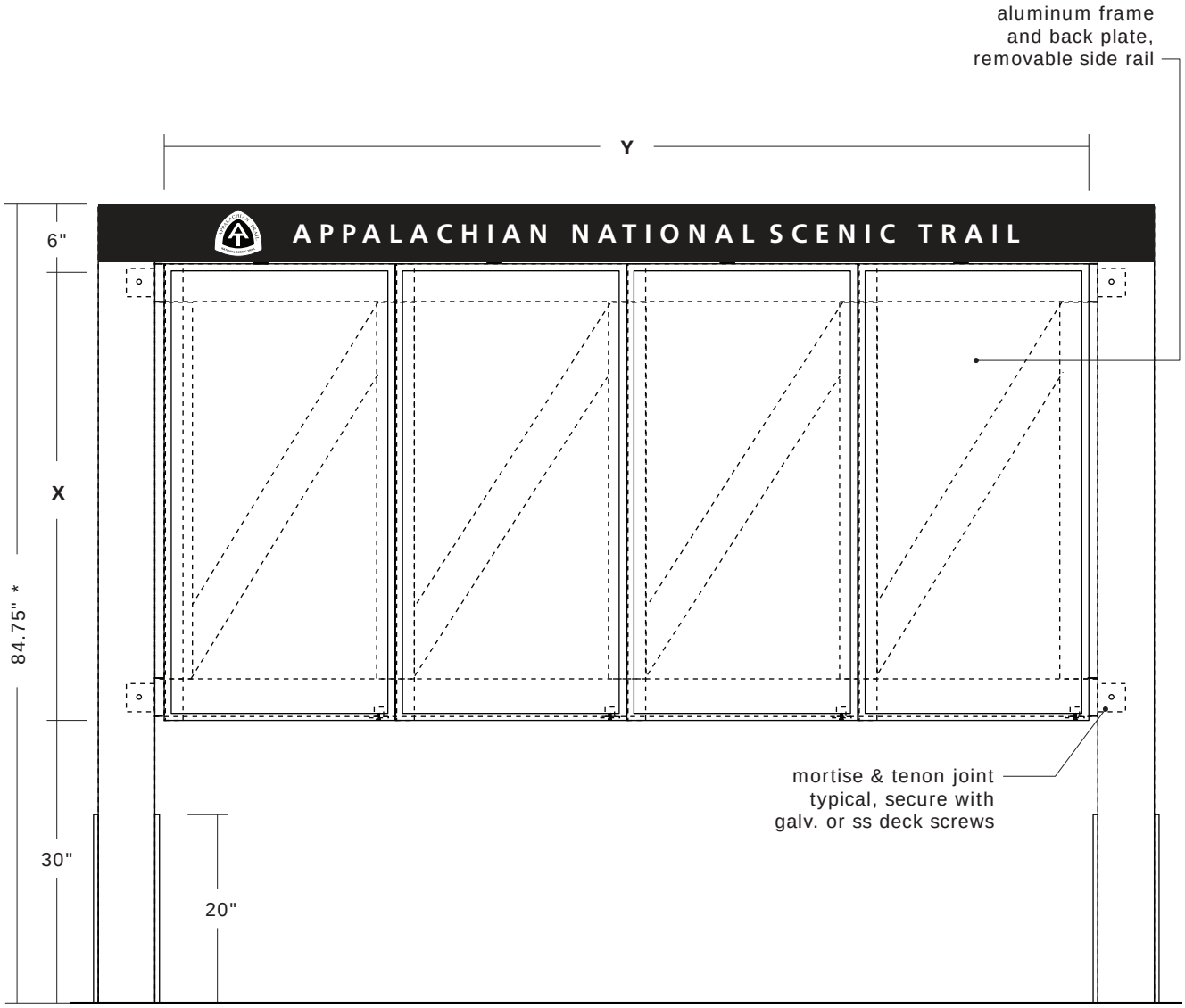
* These sizes will require 4" x 6" cross bars instead of the shown 2" x 4"

Side View
Single-sided

*Can be doubled-sided

Scale: 0.75" = 1' - 0"
Sign type: INFO-L

Information Kiosk, Aluminum or Wood, Large, No Roof



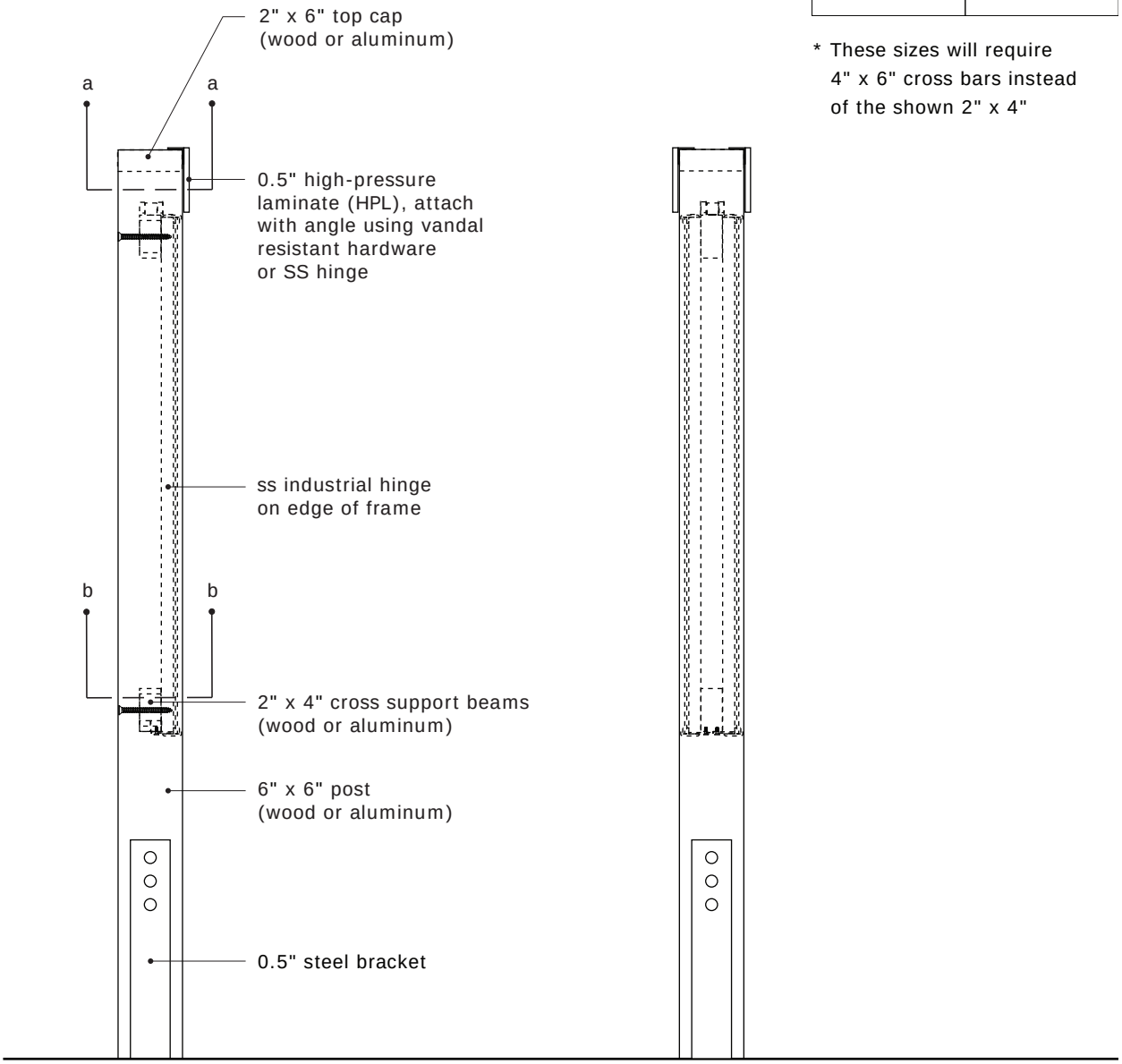
Front View

*Total height will vary based on height of panels

Scale: 0.66" = 1' - 0"
Sign type: INFO-L

	Kiosk dimensions	
	X	**Y**
	3 feet	6 feet
Example shown	4 feet	8 feet*
	5 feet	10 feet*

* These sizes will require 4" x 6" cross bars instead of the shown 2" x 4"

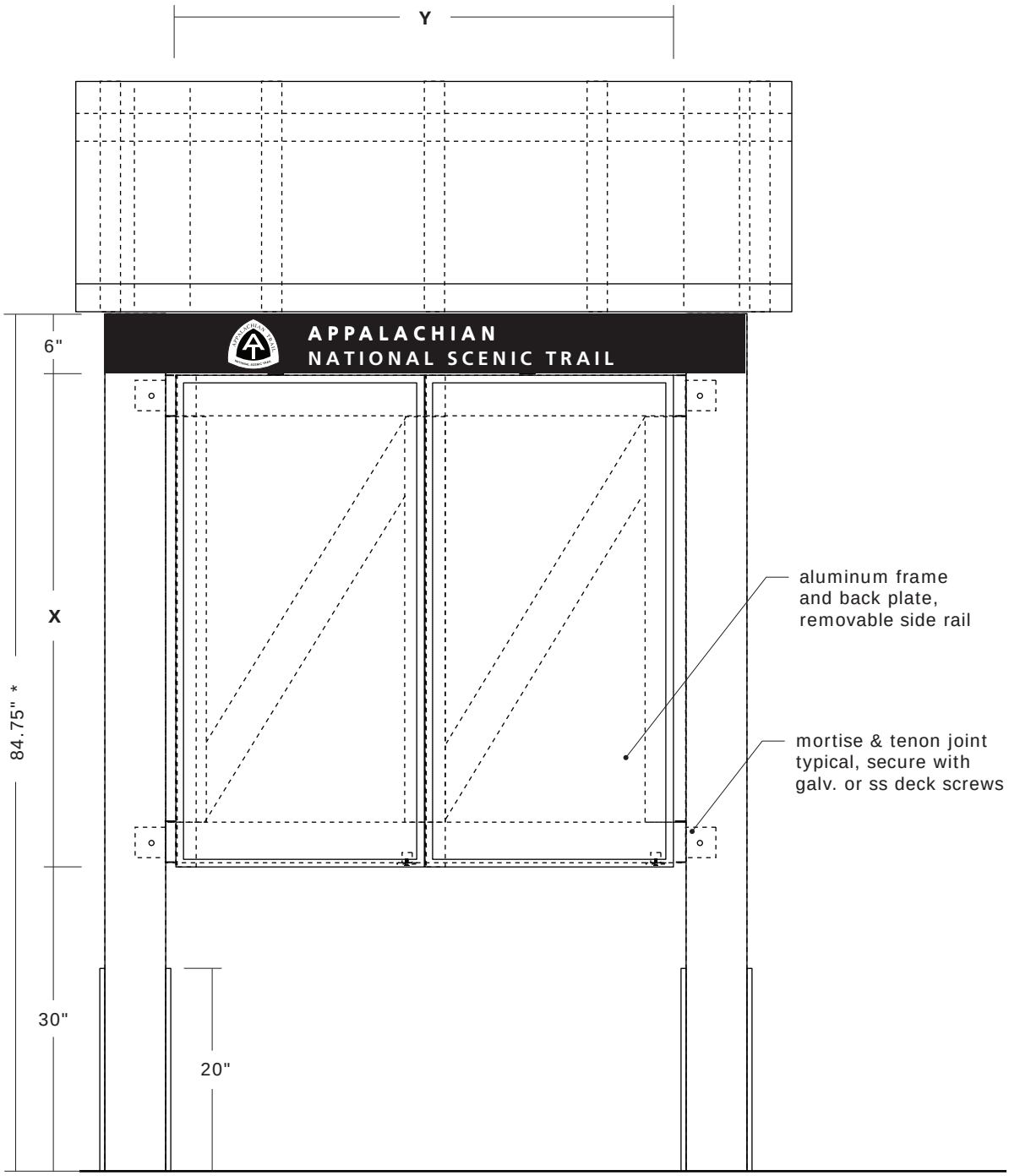


Side View
Single-sided

Side View
Double-sided

Scale: 0.75" = 1' - 0"
Sign type: INFO-L

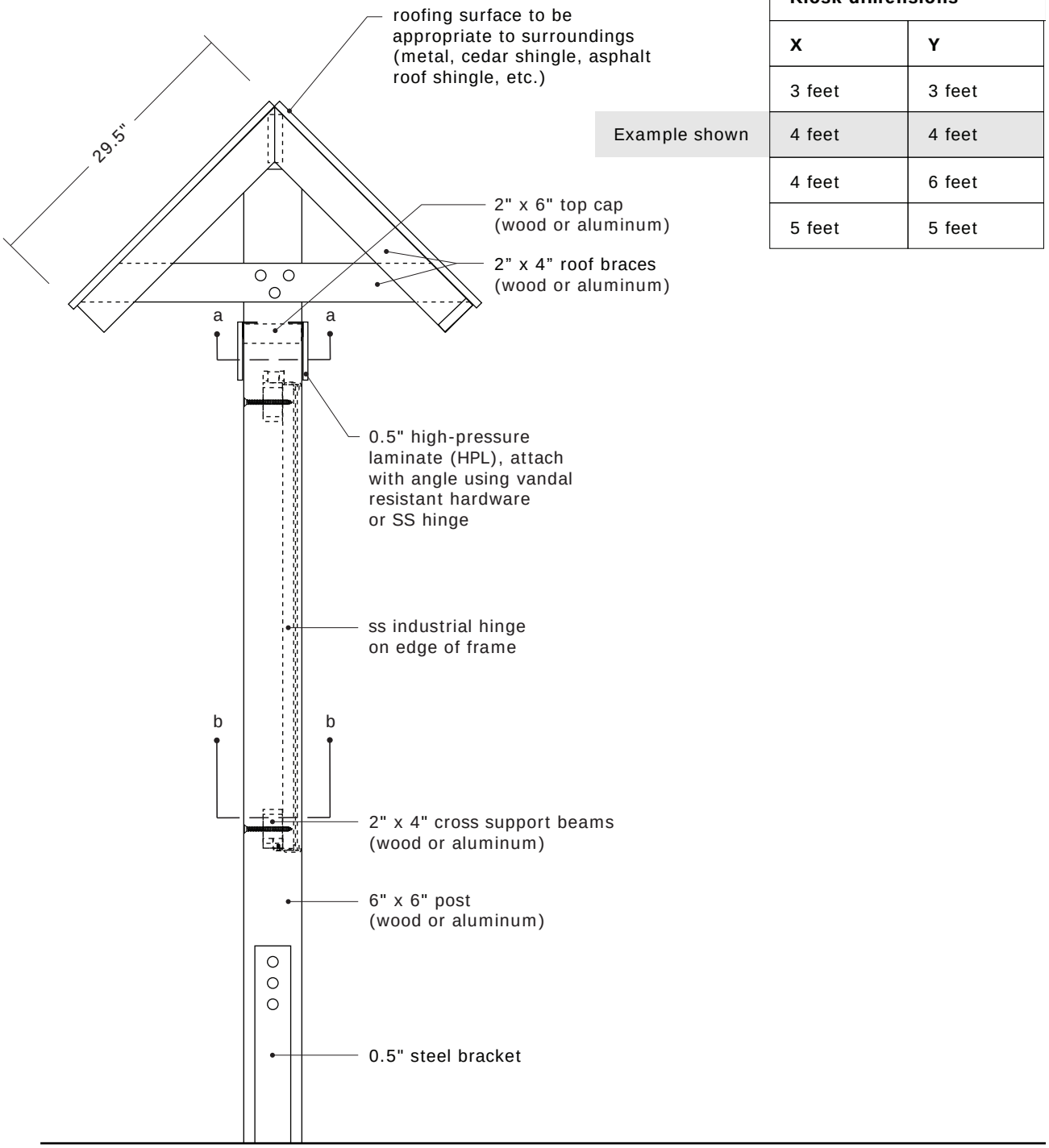
Information Kiosk, Aluminum or Wood, Medium, With Roof



Front View

Scale: 0.75" = 1' - 0"
Sign type: INFO-M

Kiosk dimensions	
X	**Y**
3 feet	3 feet
Example shown 4 feet	4 feet
4 feet	6 feet
5 feet	5 feet

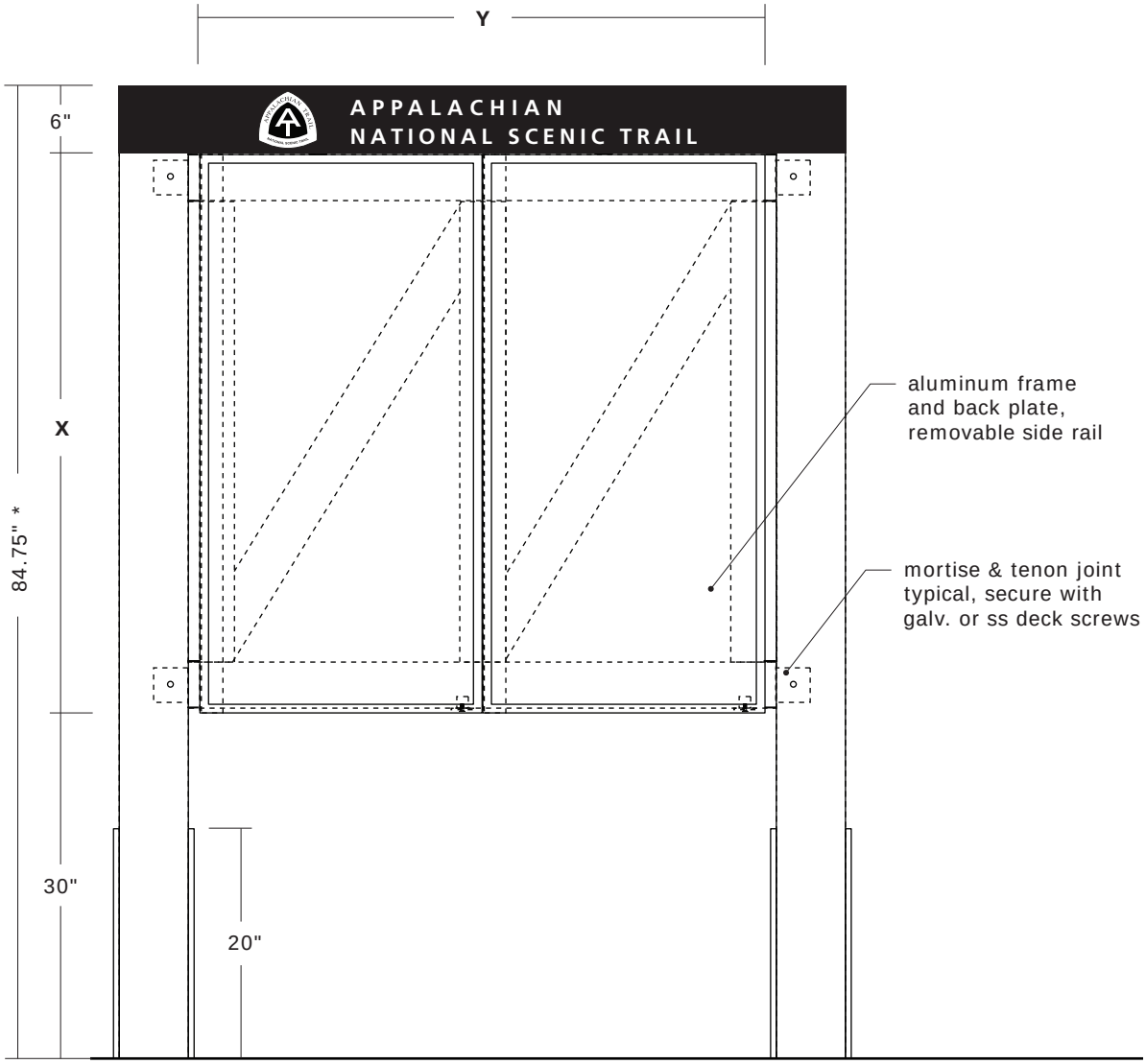


Side View

*Can be doubled-sided

Scale: 0.75" = 1' - 0"
Sign type: INFO-M

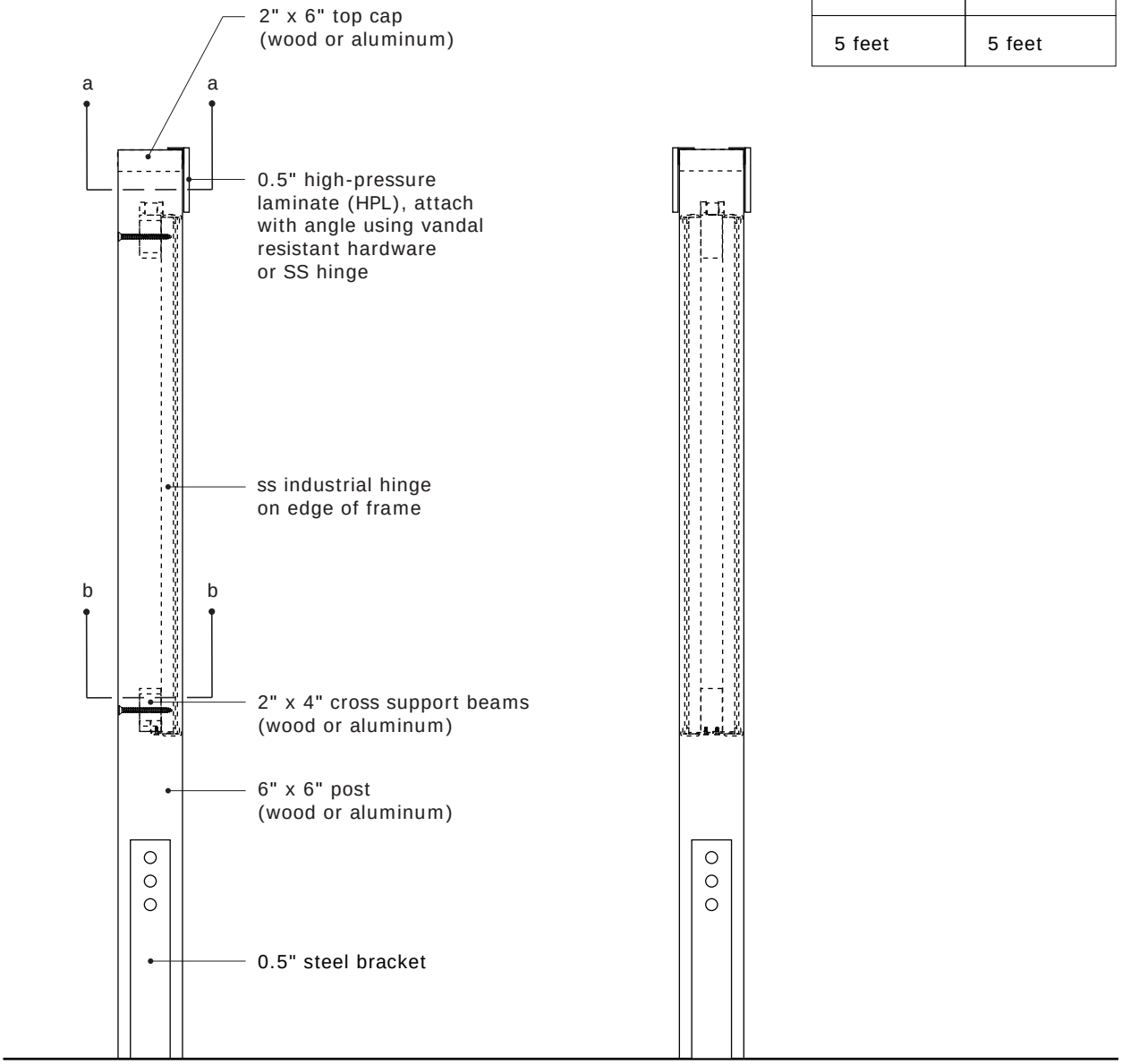
Information Kiosk, Aluminum or Wood, Medium, No Roof



Front View

Scale: 0.75" = 1' - 0"
Sign type: INFO-M

	Kiosk dimensions	
	X	**Y**
	3 feet	3 feet
Example shown	4 feet	4 feet
	4 feet	6 feet
	5 feet	5 feet

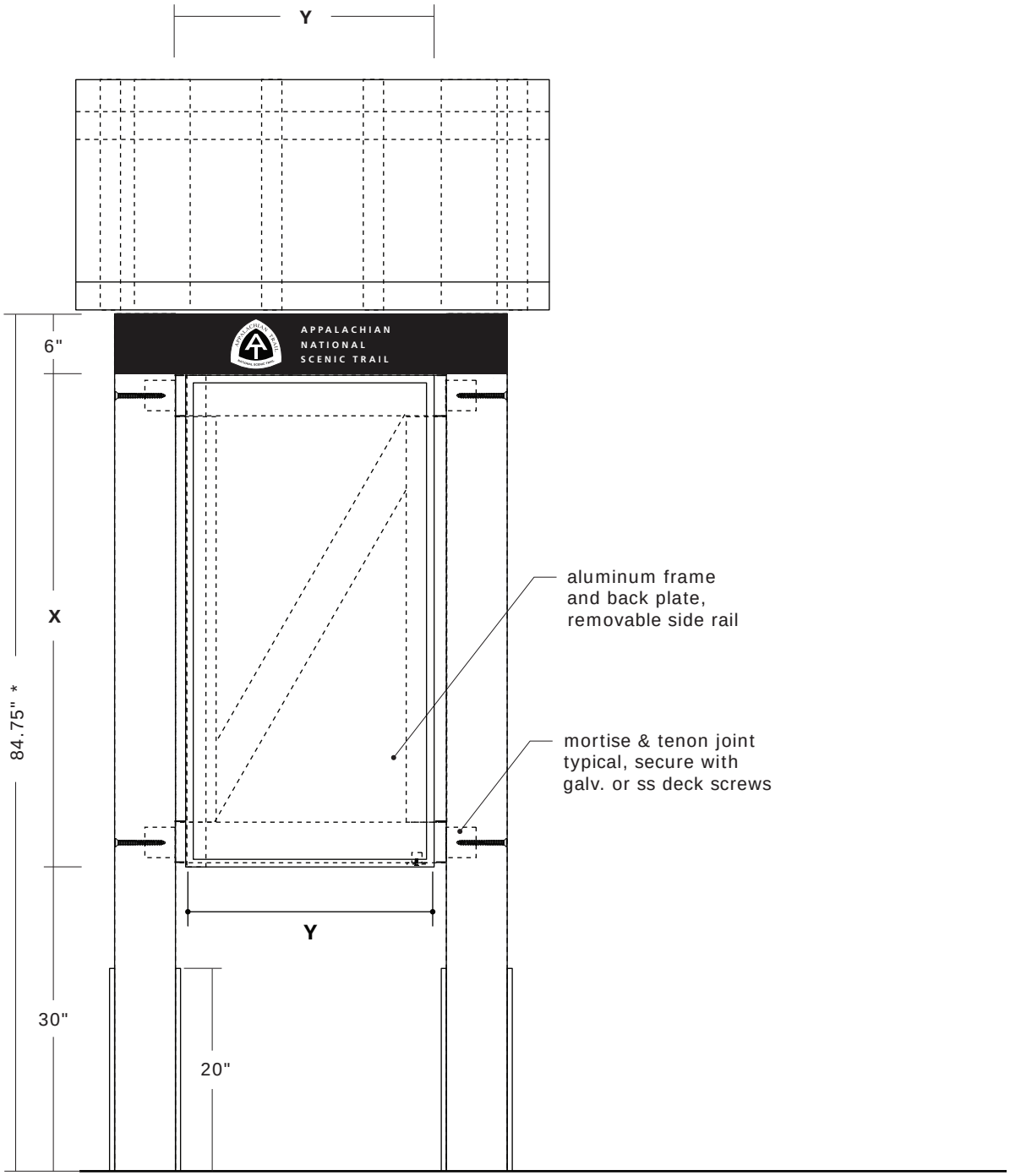


Side View
Single-sided

Side View
Double-sided

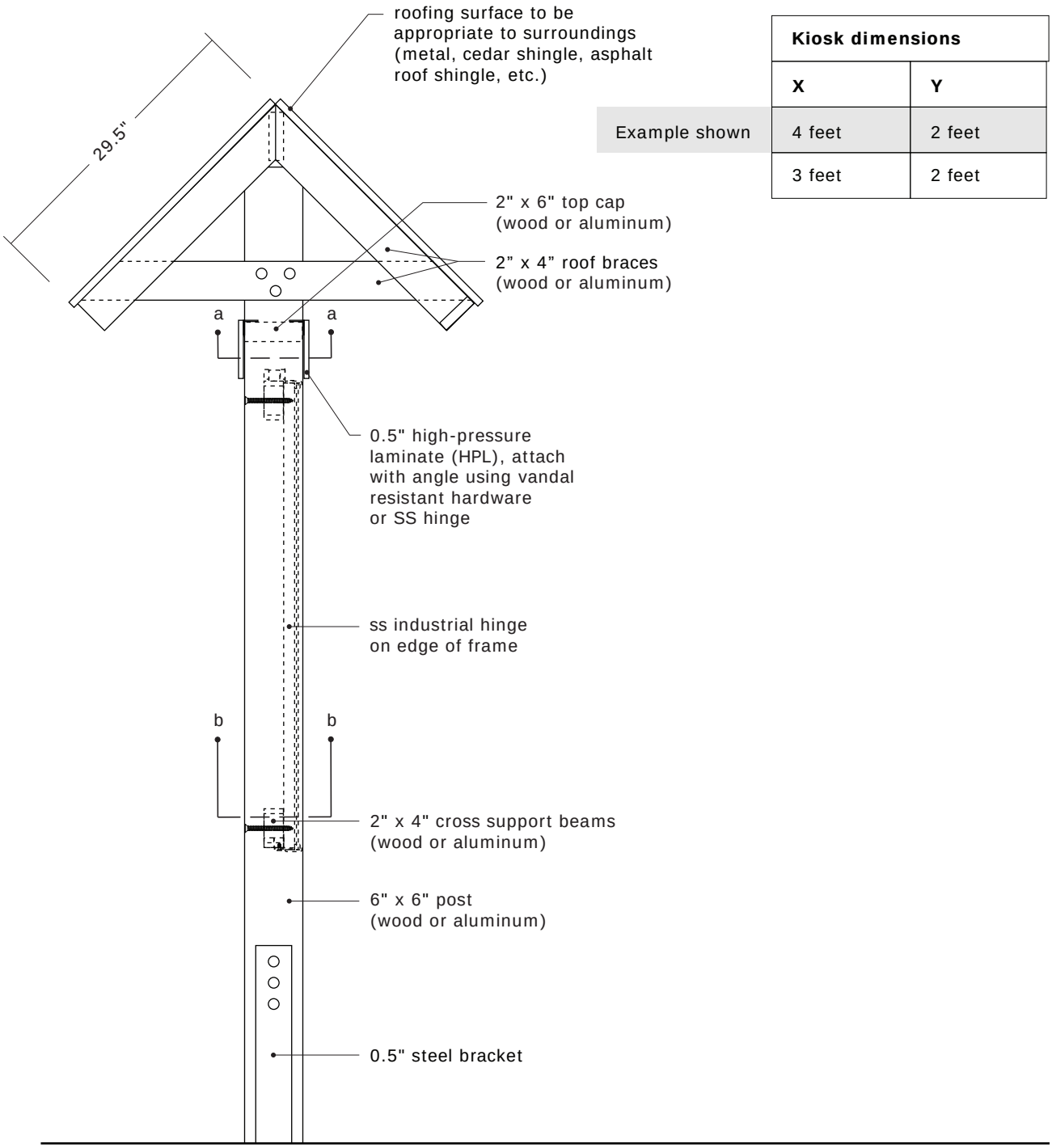
Scale: 0.75" = 1' - 0"
Sign type: INFO-M

Information Kiosk, Aluminum or Wood, Small, With Roof



Front View

Scale: 0.75" = 1' - 0"
Sign type: INFO-S



Side View

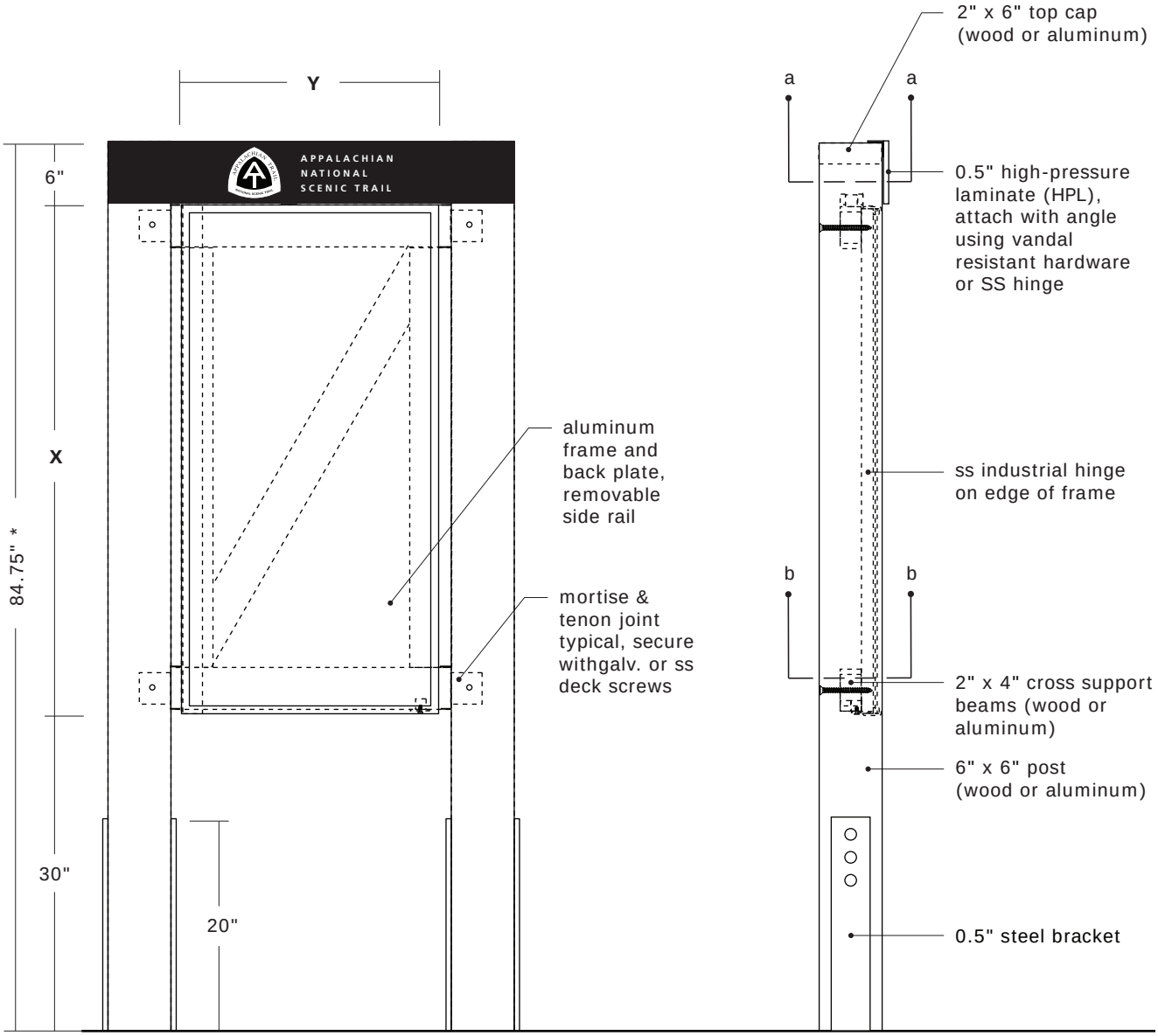
Kiosk dimensions		
	X	**Y**
Example shown	4 feet	2 feet
	3 feet	2 feet

*Can be doubled-sided

Scale: 0.75" = 1' - 0"
Sign type: INFO-S

Information Kiosk, Aluminum or Wood, Small, No Roof

	Kiosk dimensions	
	X	**Y**
Example shown	4 feet	2 feet
	3 feet	2 feet



Front View

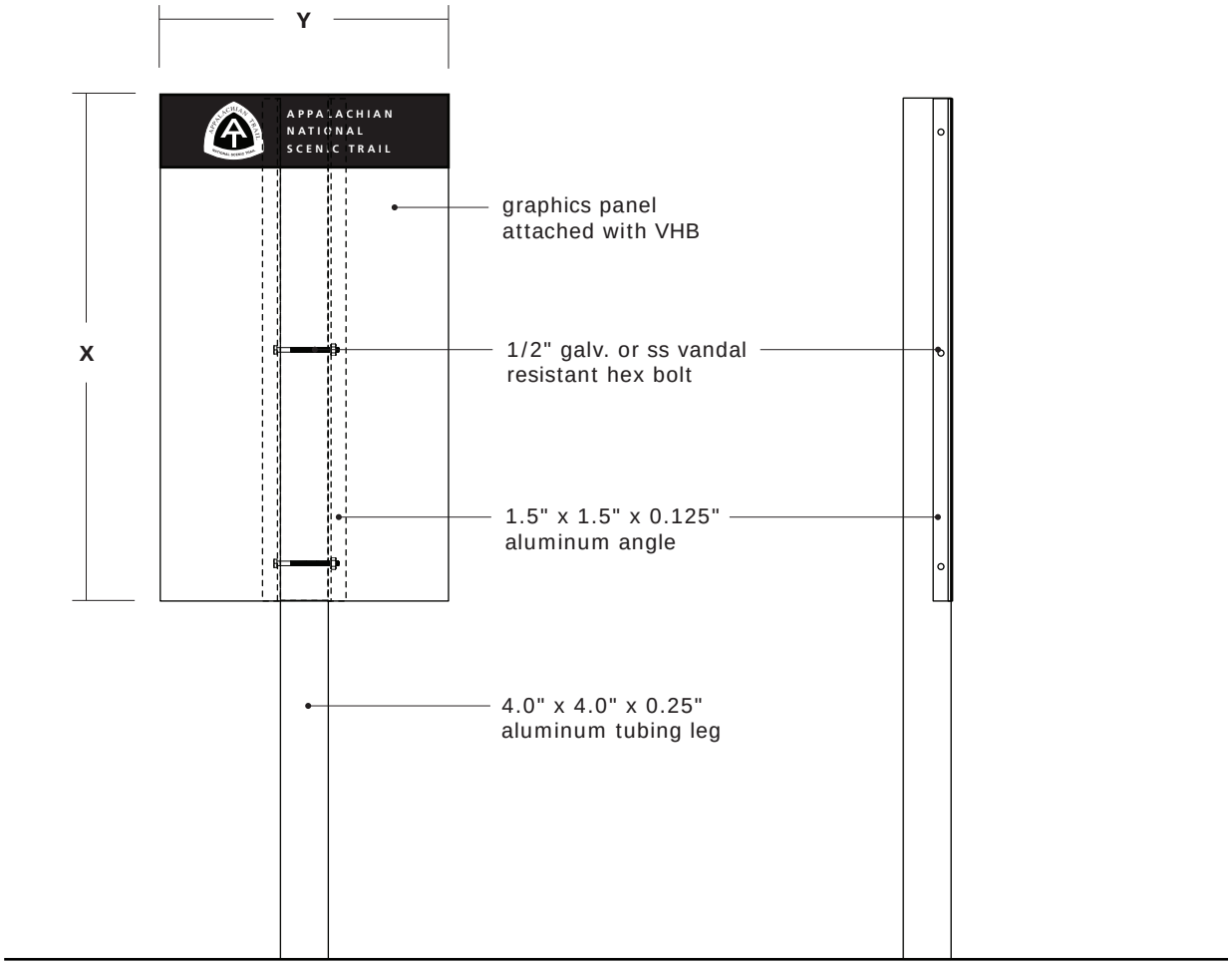
Side View
Single-sided

*Can be doubled-sided

Scale: 0.75" = 1' - 0"
Sign type: INFO-S

Information Kiosk, Aluminum, Single Post, Small, No Roof

	Kiosk dimensions	
	X	**Y**
	4 feet	2 feet
Example shown	3 feet	2 feet



Front View

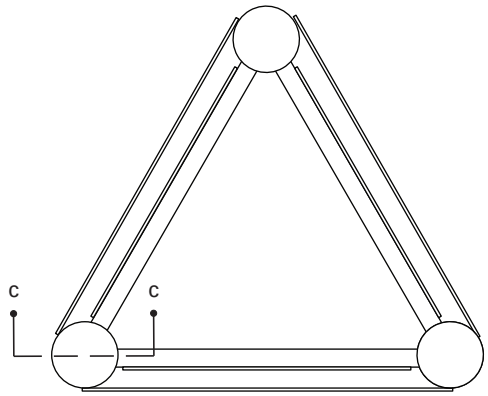
Side View
Single-sided

*Can be doubled-sided

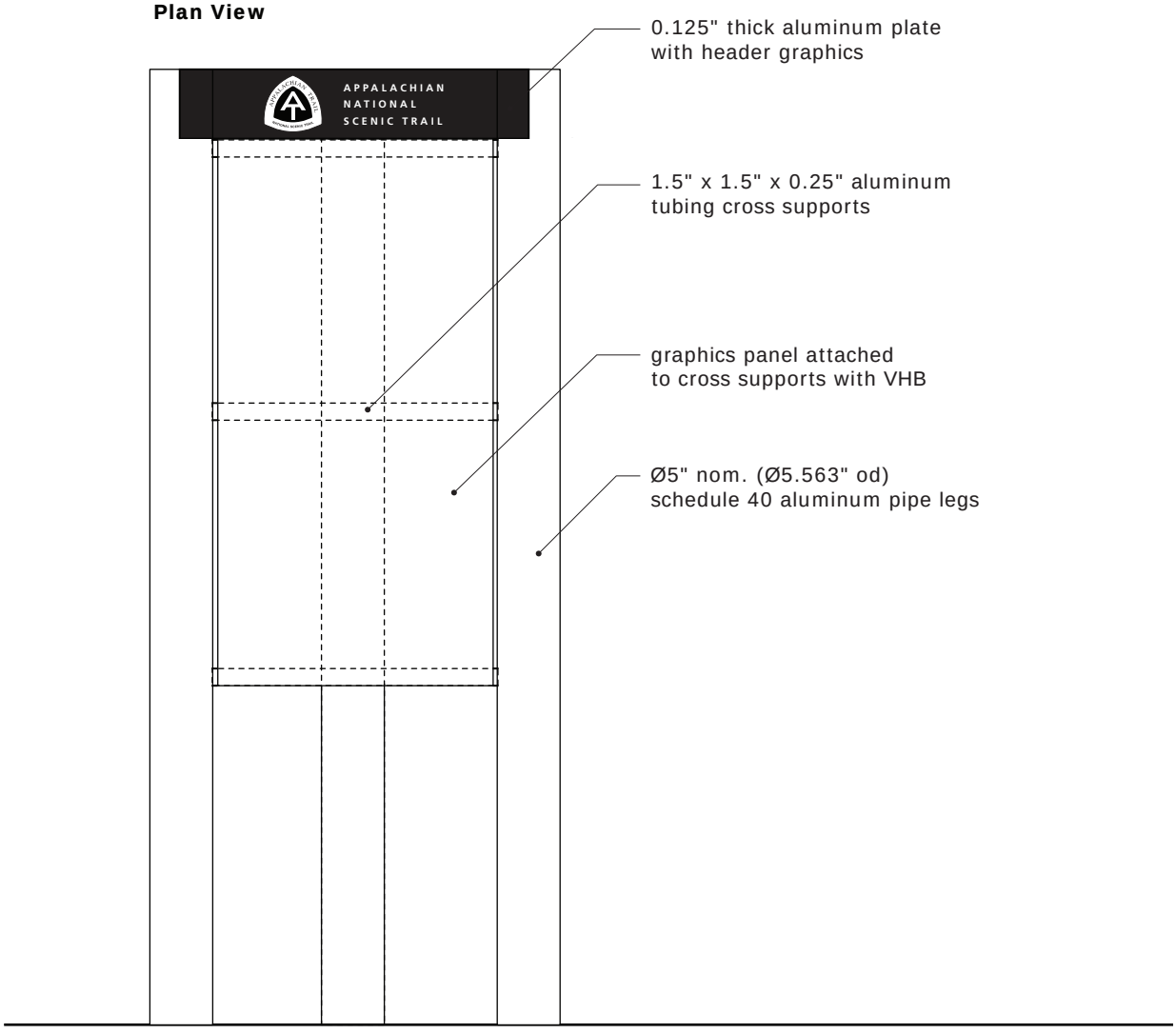
Scale: 0.75" = 1' - 0"

Sign type: INFO-S

Information Kiosk, Aluminum, Tri-Kiosk, Small, No Roof



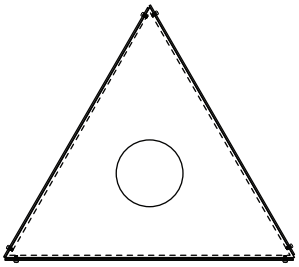
Plan View



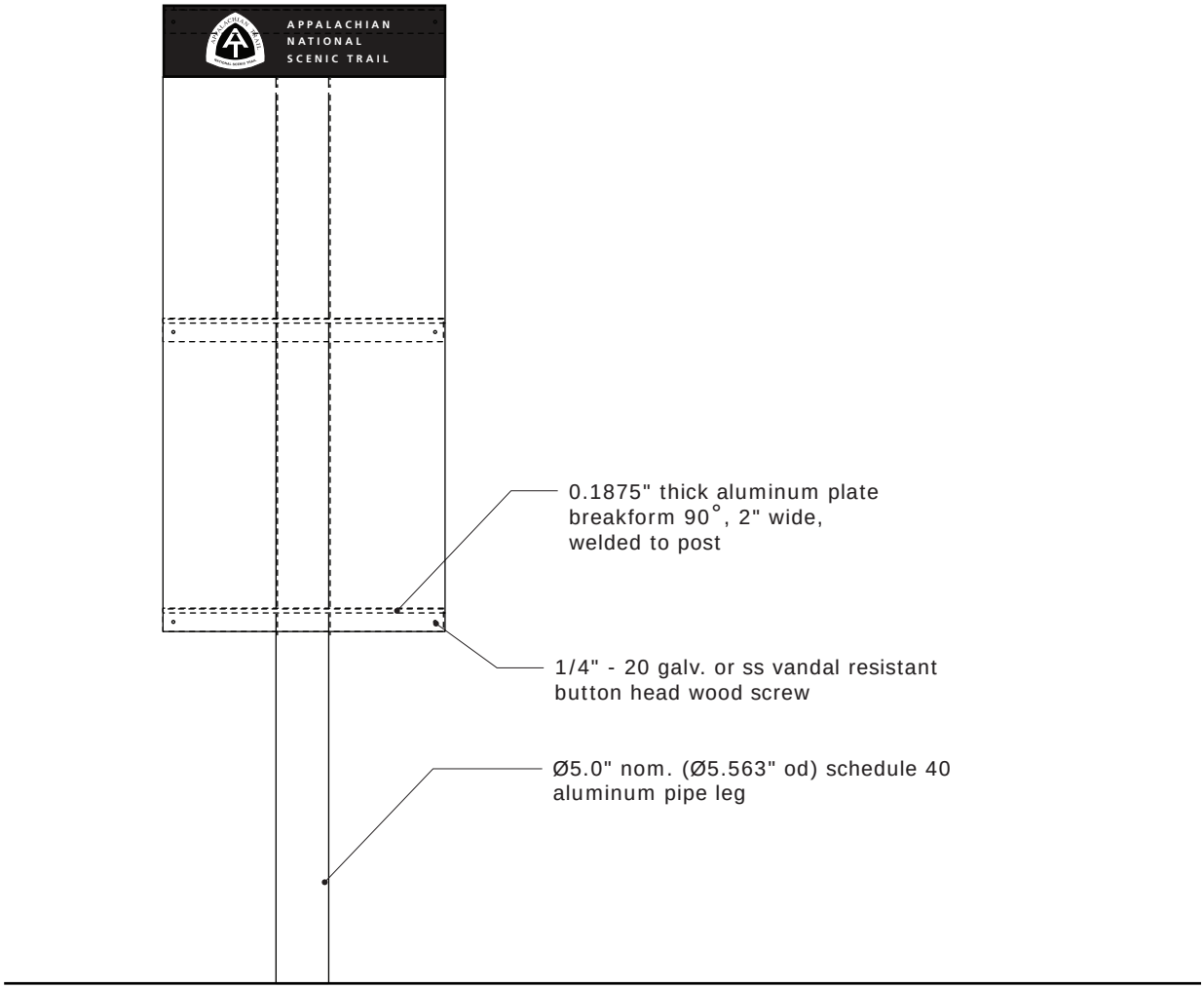
Front View

Scale: 0.75" = 1' - 0"
Sign type: INFO-T

Information Kiosk, Aluminum, Tri-Kiosk, Single Post, Small, No Roof

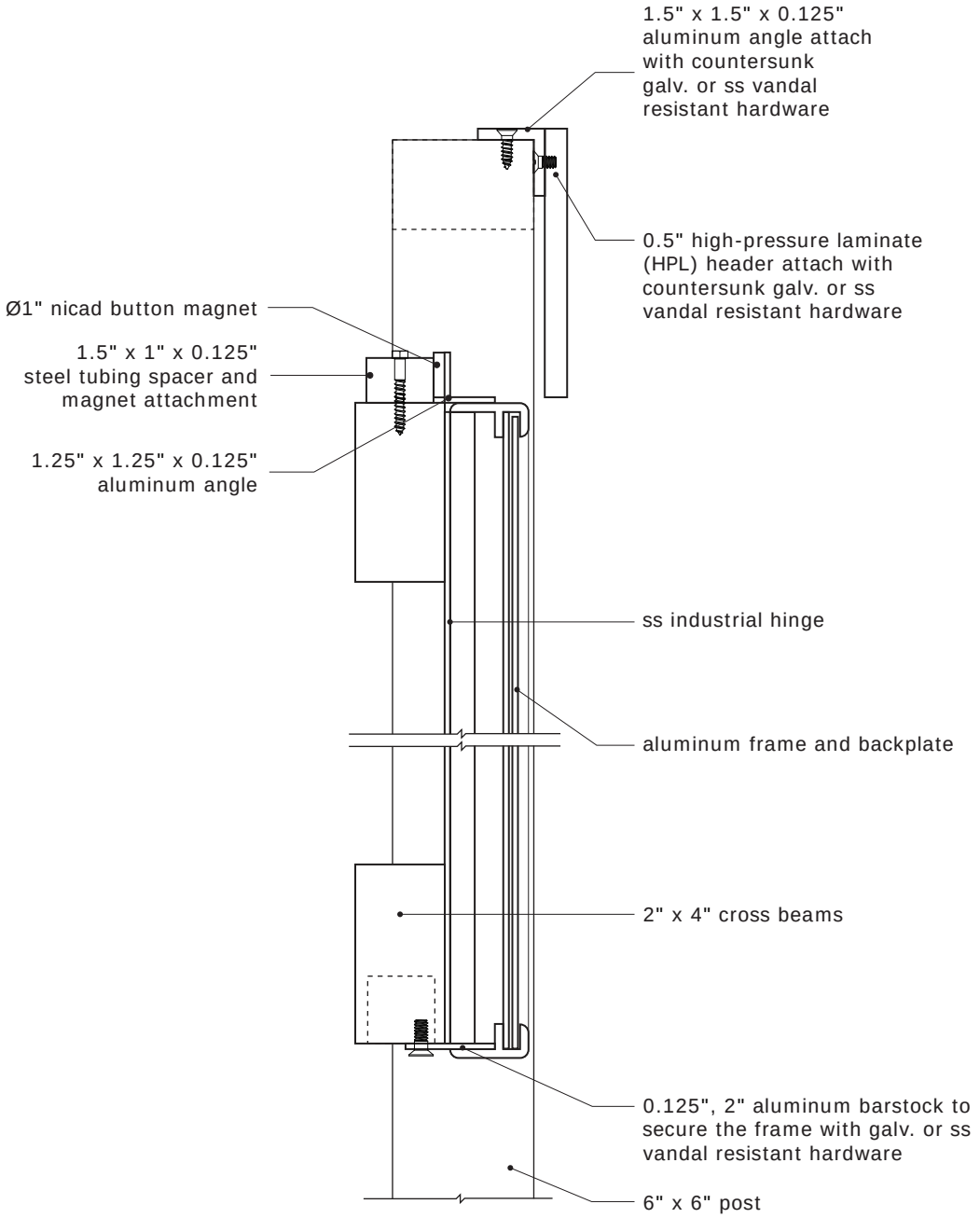


Plan View



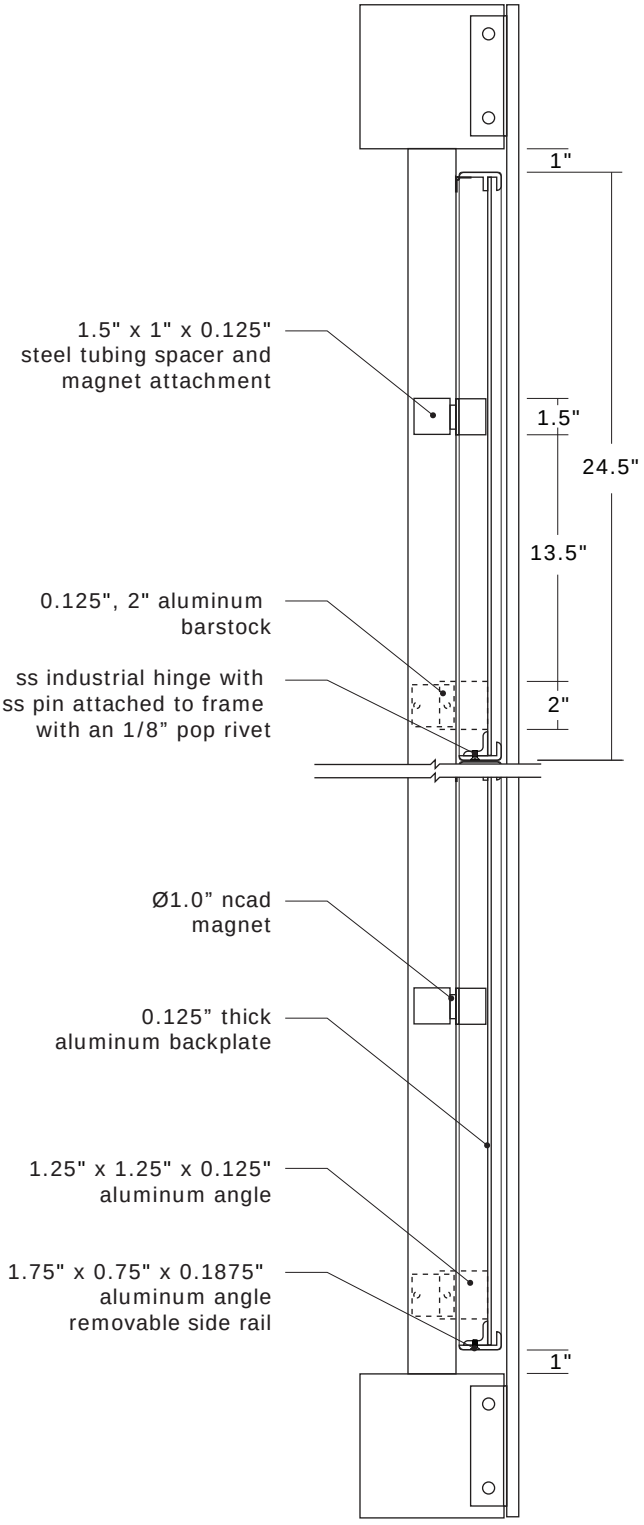
Front View

Scale: 0.75" = 1' - 0"
Sign type: INFO-T

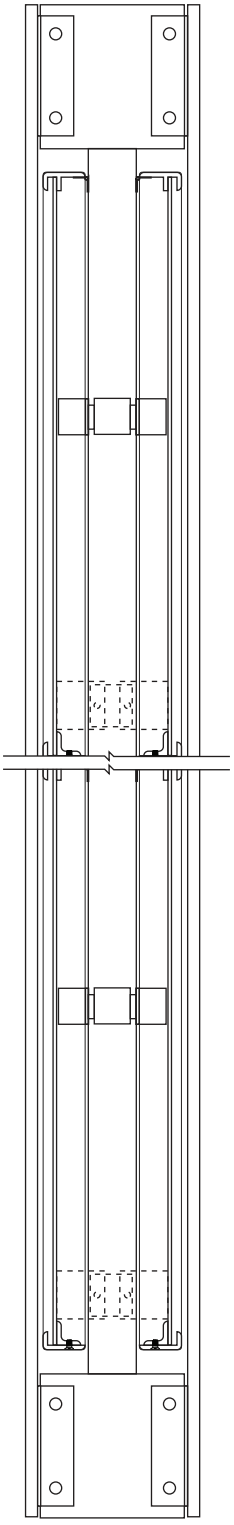


Lock Detail a-a

Scale: 3" = 1' - 0"
Sign type: INFO

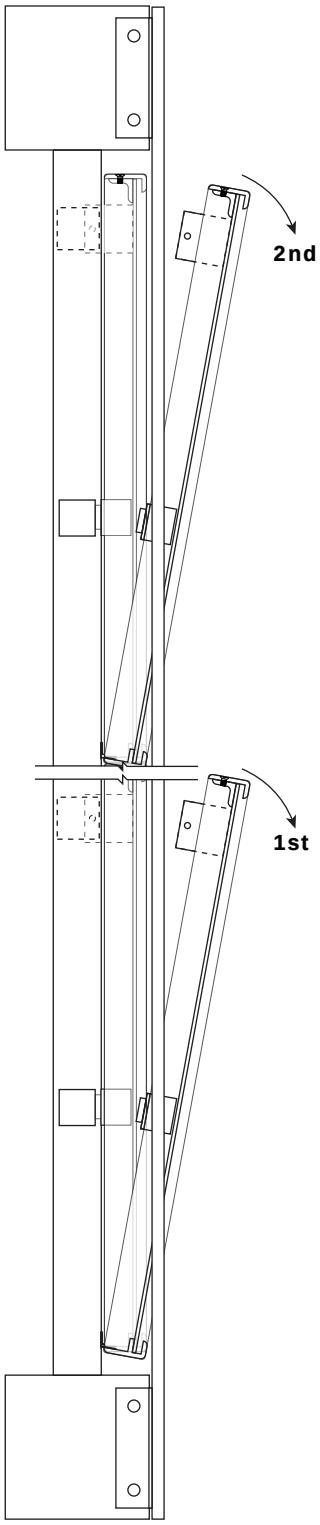


Frame Connection Detail b-b
Single-sided

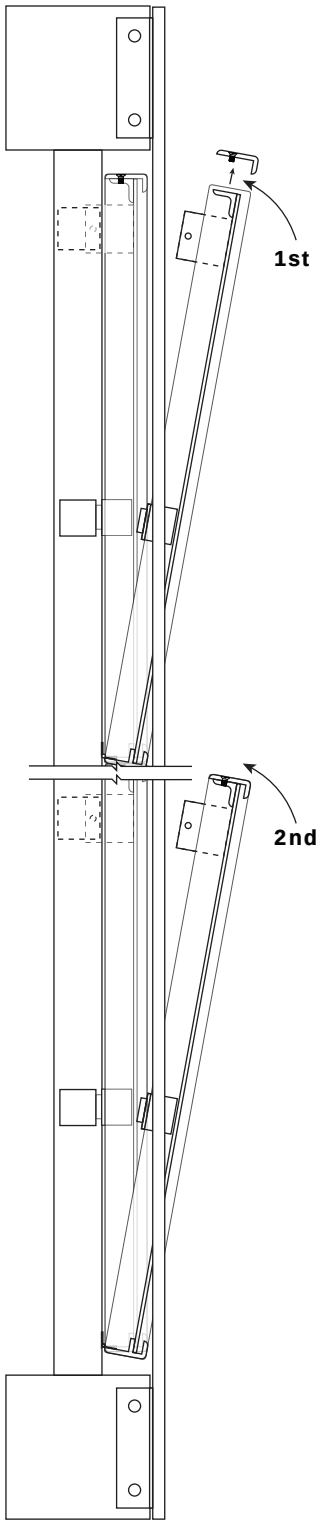


Frame Connection Detail
Double-sided

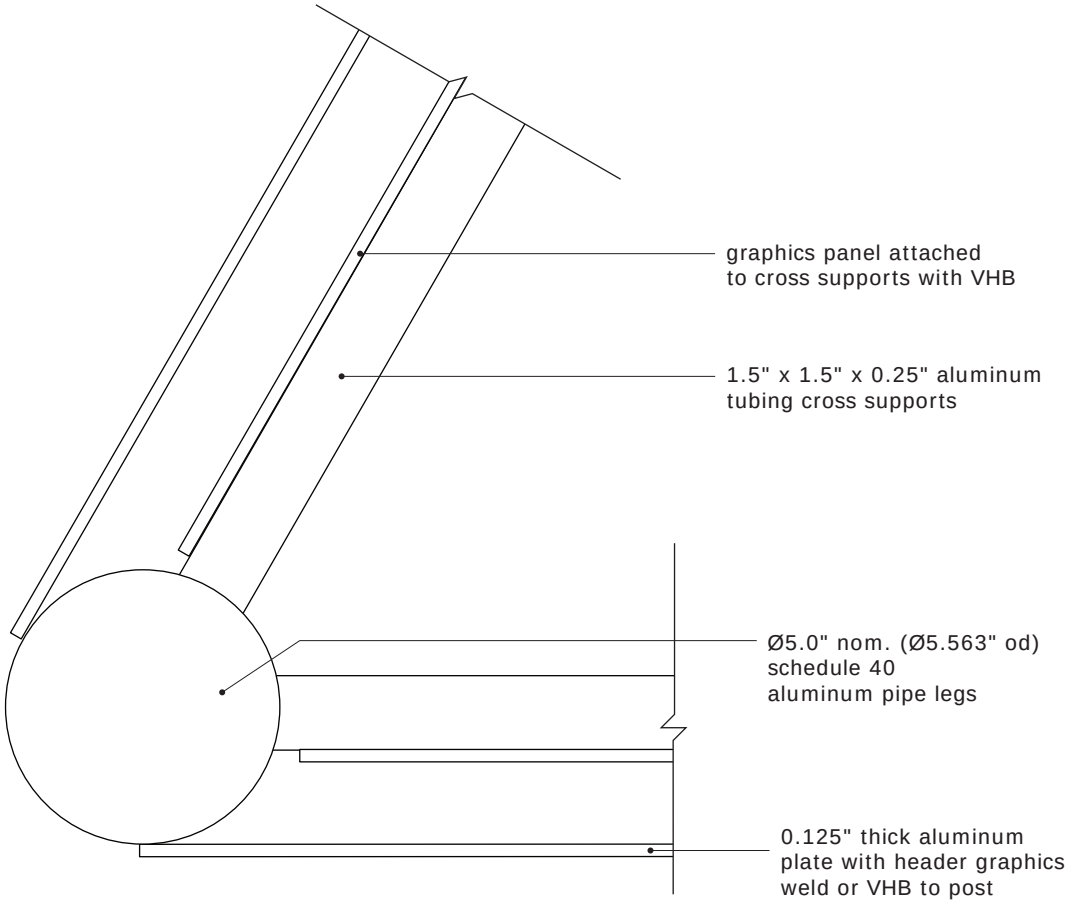
Scale: 1.5" = 1' - 0"
Sign type: INFO



Step 1
Remove the allen screws at the base of the frame and cross support beam. Starting on the left, swing 1st frame open. Repeat the steps sequentially until all frames are open.



Step 2
Remove the side rail on last frame, replace the panel, replace the side rail and swing the frame closed connecting with the magnet. Secure it into place with hardware at the base. Repeat the steps sequentially until frames are closed.



Connection Detail for Tri-Kiosk c-c

Scale: 3" = 1' - 0"
Sign type: INFO-T

ETIQ Etiquette Marker

The purpose of Etiquette Markers is to reinforce the regulatory messaging for the site.

The marker should be positioned away from the immediate entrance of the path—ideally 50 feet down the trail. This gives visitors enough time to decompress and be more receptive to the messaging.

There are three sections to this sign: regulatory symbols, Leave No Trace messaging, and a "Be Prepared" section. It is important to combine the regulatory symbols with the other messaging. Visitors are more likely to stop, read, and heed a regulatory message if it is paired with other useful and interesting information.

Maximum number of symbols: 10

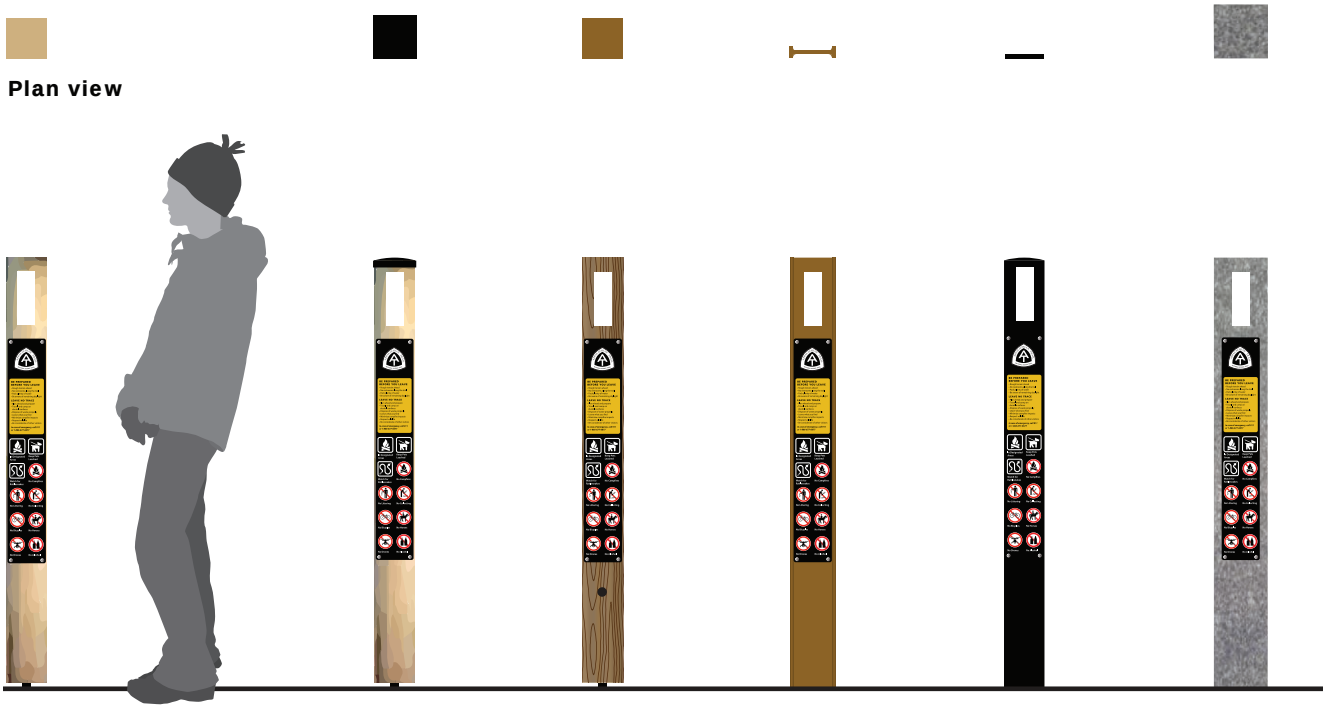
Maximum number of "Be Prepared Before You Leave" bullet points: 4

Leave No Trace message included here is standard messaging and should not be altered.

Always include 911 and/or APPA dispatch number.

See page 4.5 for list of symbols.

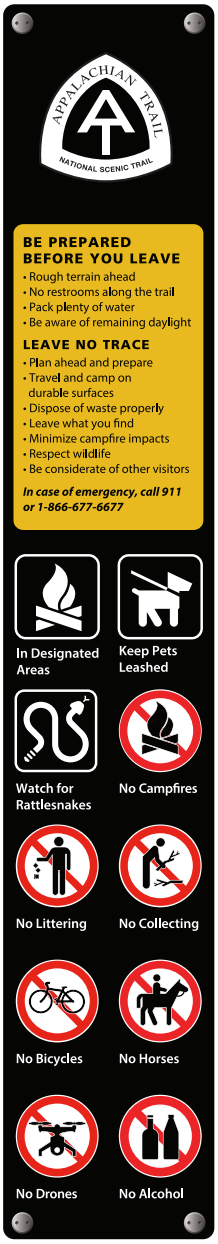
Etiquette panels at NPS sites must include the five required NPS symbols per APPA Acting Chief Ranger and Superintendent's Compendium. Those 5 symbols are: no littering, no collecting, no bicycles, no horses, and no drones/unmanned aircraft.



Scale: 9/16" = 1'- 0"
Sign type: ETIQ

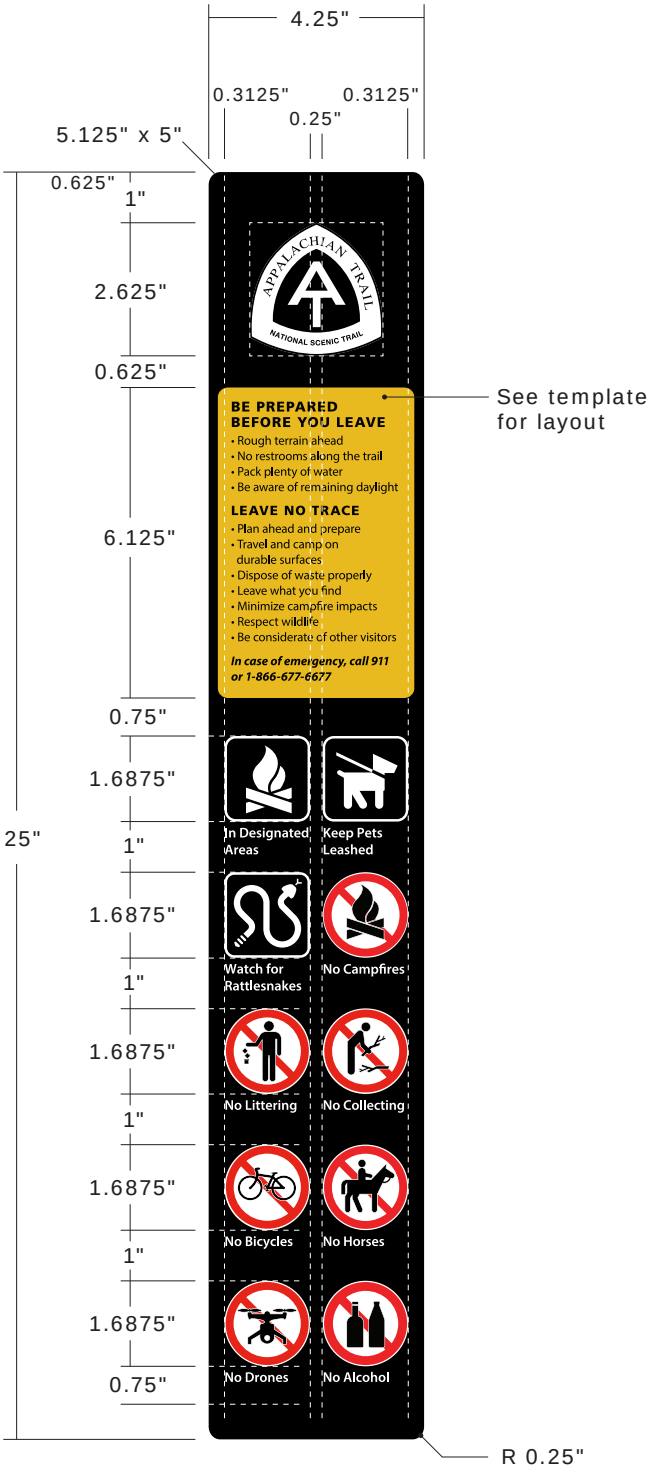
Example 1
6 symbols

Example 2
8 symbols



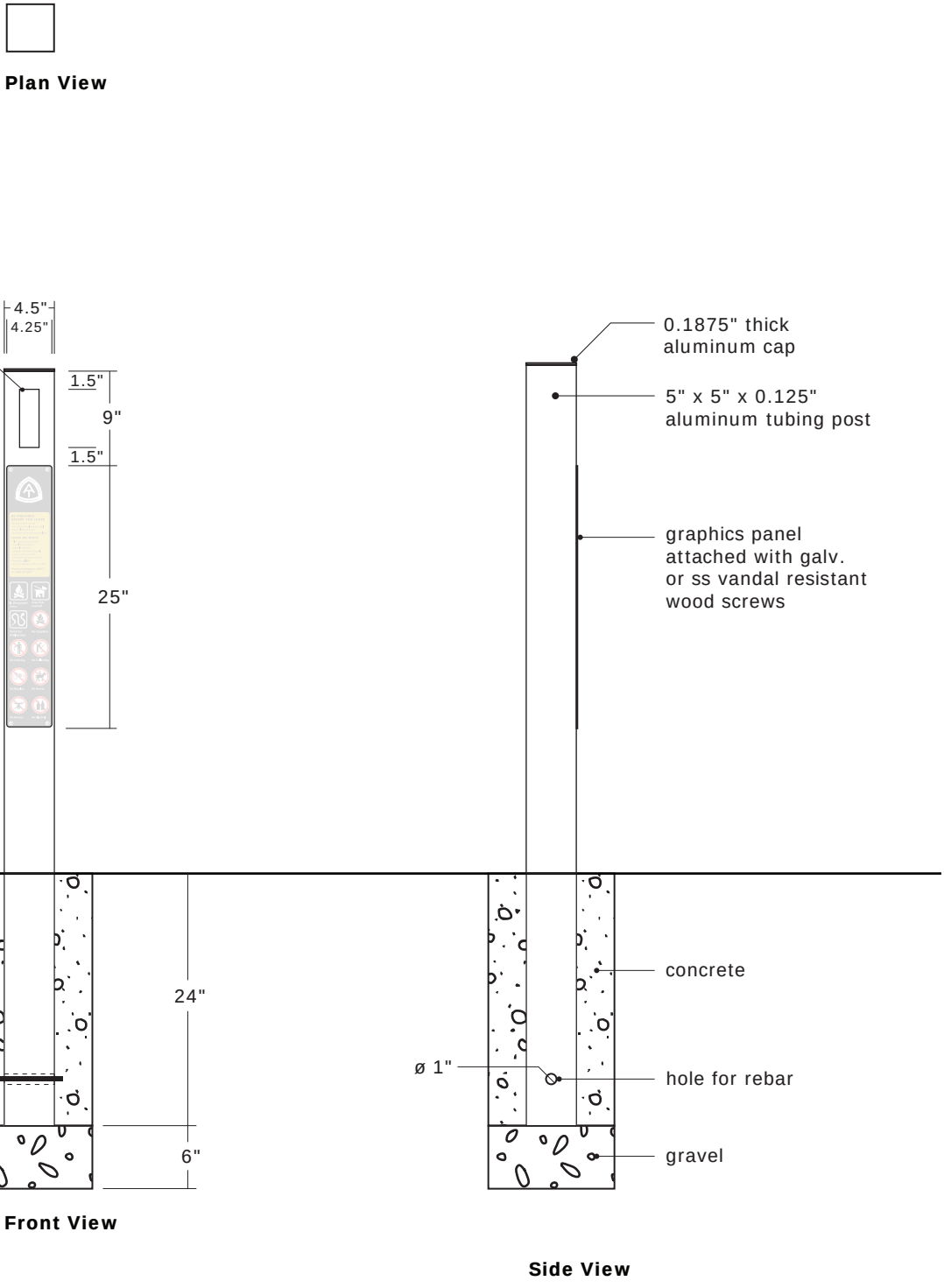
Example 3
10 symbols
(maximum)

Standard layout



1 Maximum symbols: 10

Scale: 1" = 1'- 0"
Sign type: ETIQ



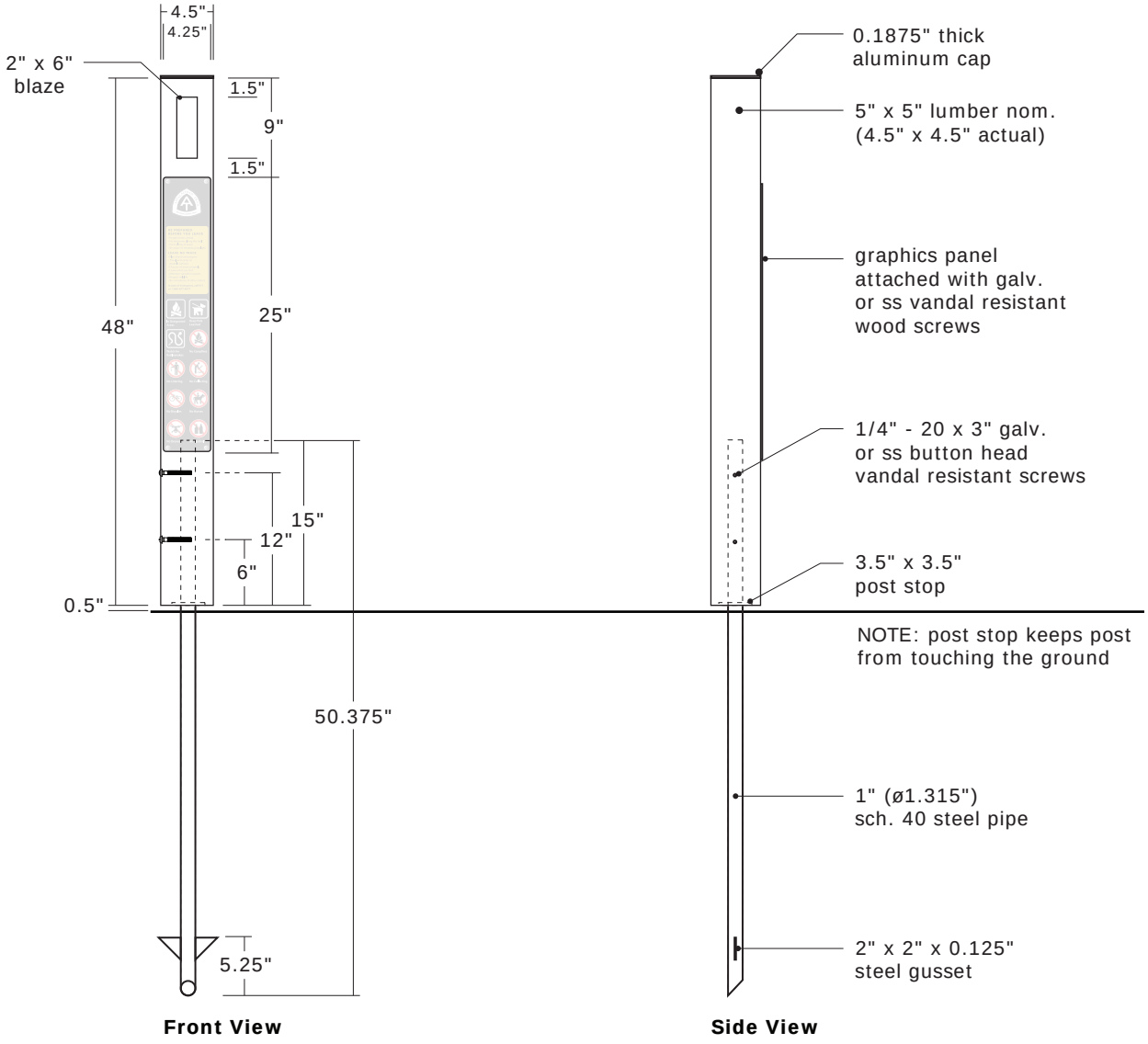
Plan View

Front View

Side View

Scale: 0.75" = 1' - 0"
Sign type: ETIQ

Plan View



Front View **Side View**

Scale: 0.75" = 1' - 0"
Sign type: ETIQ

Section 6: Fabrication

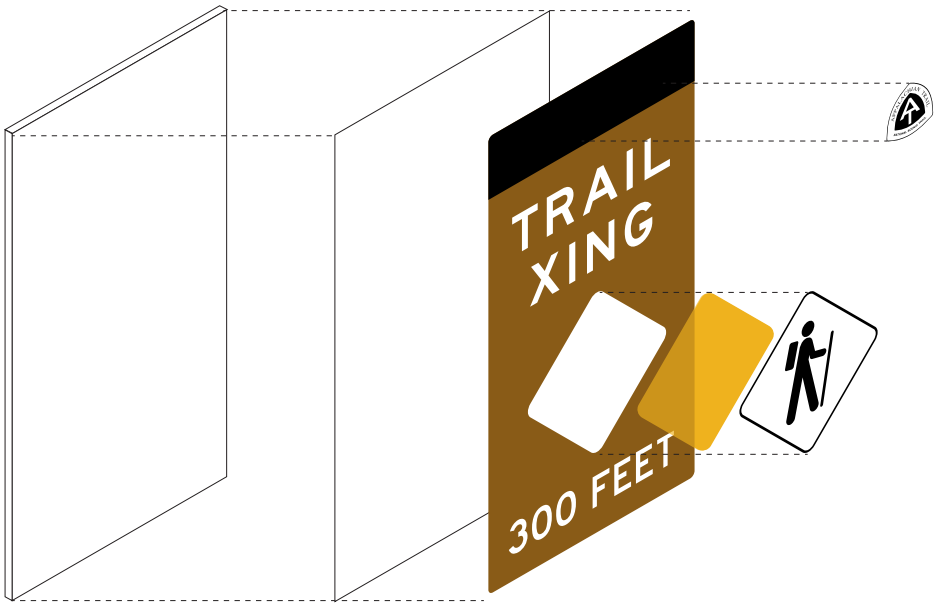
Introduction

This section includes fabrication options for all graphics panels.

Scale: not to scale	
Lifespan	**Cost**
••• 10-20 years	••• (high)
•• > 7 years	•• (medium)
• < 7 years	• (low)

ADVT Advanced Trail Crossing Panel Fabrication

Option 1 **Electro Cut Vinyl on Engineering Grade Vinyl ••/••**



Aluminum panel

Retro Reflective Engineer Grade Vinyl sheeting base (white)

Electrocut film letters & header (brown & off white)

Vinyl printed individual logo

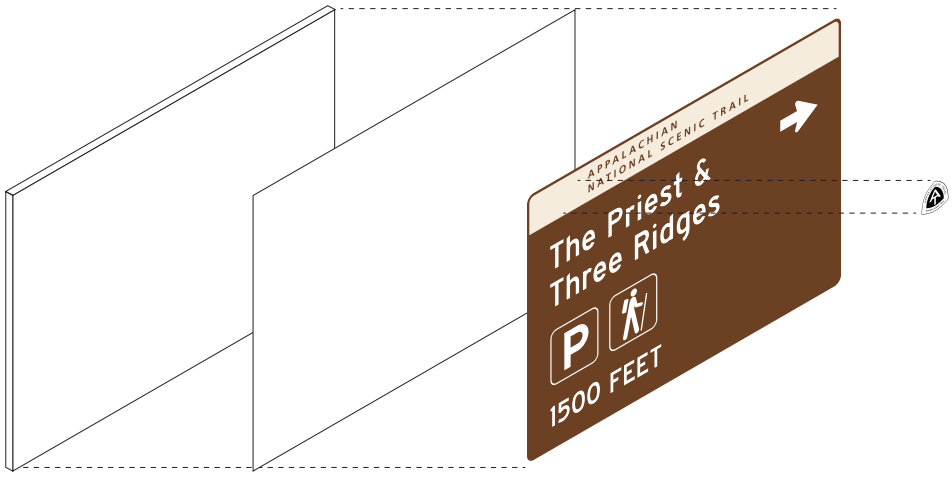
Option 2 **Full Retro Reflective Vinyl Print ••/••**

Aluminum panel with **retro reflective vinyl** print*

* Direct print can be on retro reflective engineer or diamond grade white base.

ADVV Advanced Directional Panel Fabrication

Option 1 **Electro Cut Vinyl on Engineering Grade Vinyl ••/••**



Aluminum panel

Retro Reflective Engineer Grade Vinyl sheeting base (white)

Electrocut film letters & header (brown & off white)

Vinyl printed individual logo

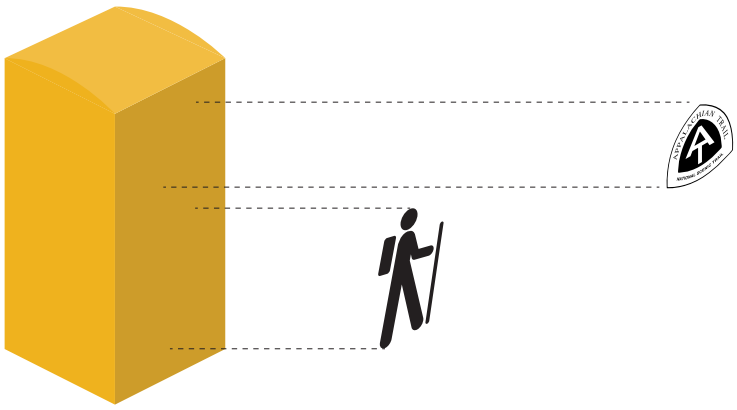
Option 2 **Full Retro Reflective Vinyl Print ••/••**

Aluminum panel with **retro reflective vinyl** print*

* Direct print can be on retro reflective engineer or diamond grade white base.

XING Trail Crossing Marker

Option 1 **Vinyl on Painted Post ••/••**

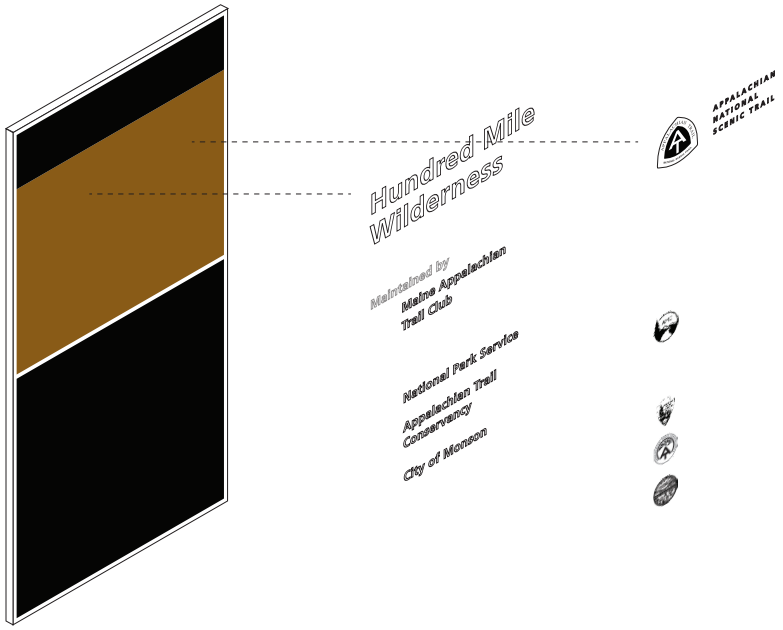


Aluminum panel, painted with automotive paint

Cut Vinyl symbol (black)

Vinyl printed individual logo

Option 1 **Intaglio •••/••**

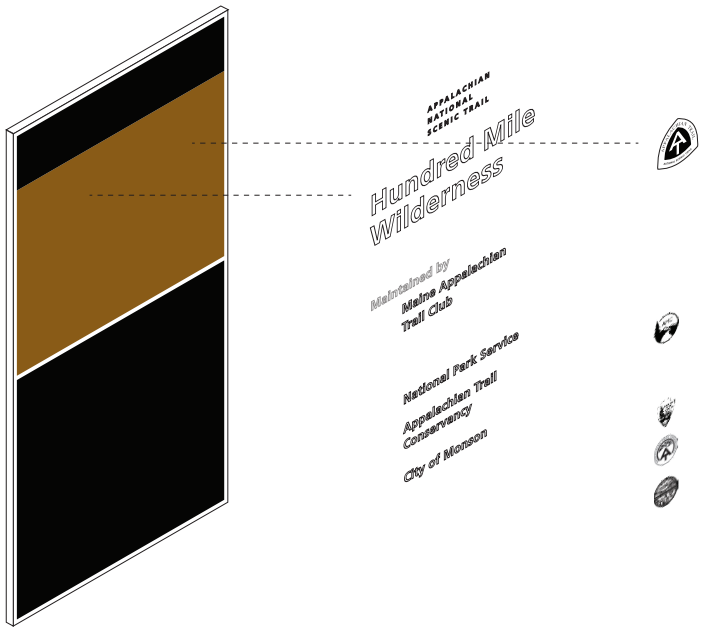


Aluminum panel **painted** with base and panel colors (white, brown, and black)

Painted letters (white)

Vinyl printed individual logos (BW or grayscale)

Option 2 **Intaglio/Vinyl ••/••**

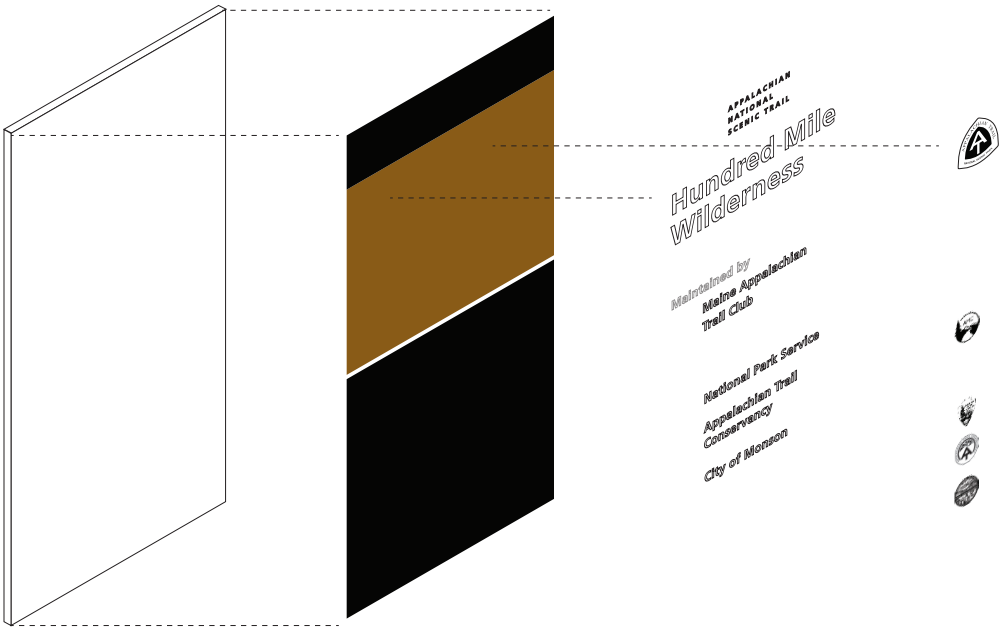


Aluminum panel **painted** with base and panel color (white, brown, and black)

Vinyl letters (white)

Vinyl printed individual logos (BW or grayscale)

Option 3 **Vinyl on Painted Panel** •/•



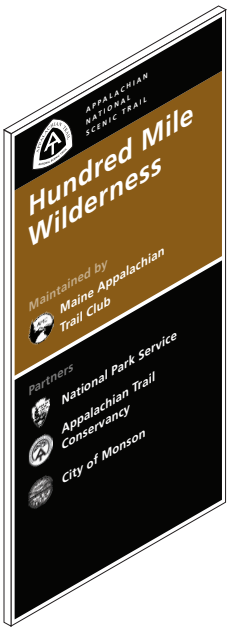
Aluminum panel **painted** with base color (white)

Vinyl sheeting base (brown and black)

Vinyl letters (white)

Vinyl printed individual logos (BW or grayscale)

Option 4 **Full Vinyl Print** •/•



Aluminum panel wrapped **vinyl** print

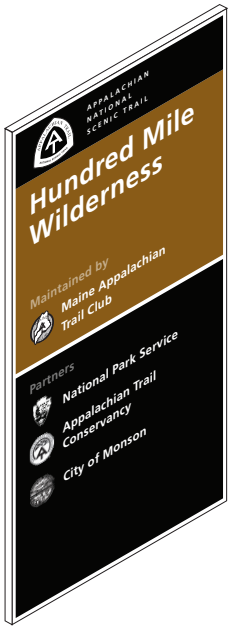
*All edges to be wrapped

Option 5 **High-Pressure Laminate (0.125" HPL) or Fiberglass (0.090”) with Aluminum Backplate ••/••**

Aluminum panel **painted** with base color (white)

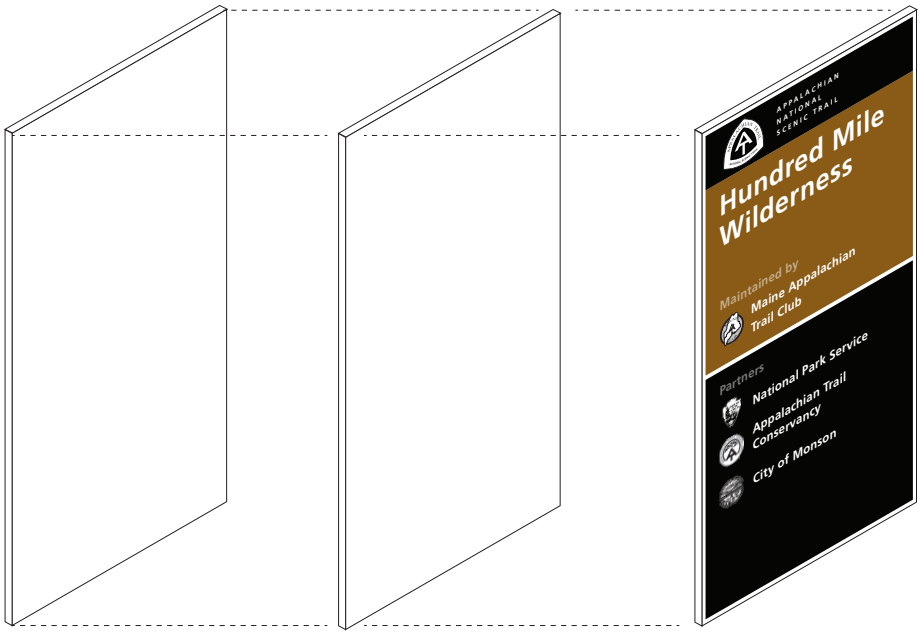
1/16” pressed panel laminated to aluminum back panel

Option 6 **High-Pressure Laminate (0.5" HPL) ••/••**



1/2” pressed structural panel, stand alone

Option 7 **Porcelain Enamel** •••/•••



Aluminum panel **painted** with base color (white)

Plywood insert for porcelain panel

Steel porcelain panel, with edge returns

Option 8 **Disublimation** ••/••

Aluminum panel **painted** with base color (white)

Ink is transferred on a carrier and baked into the panel

Design is printed on a carrier sheet

Protective coating is applied to protect the print

Option 9 **Direct Print** ••/••

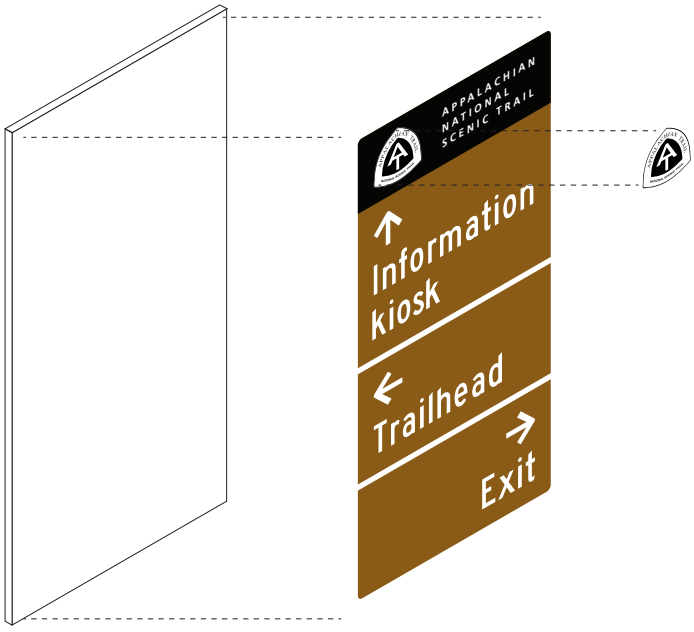
Aluminum panel **painted** with base color (white)

Ink is printed directly onto the panel

Protective coating is applied to protect the print

VEHD Vehicular Directional

Option 1 **Intaglio** •••/••

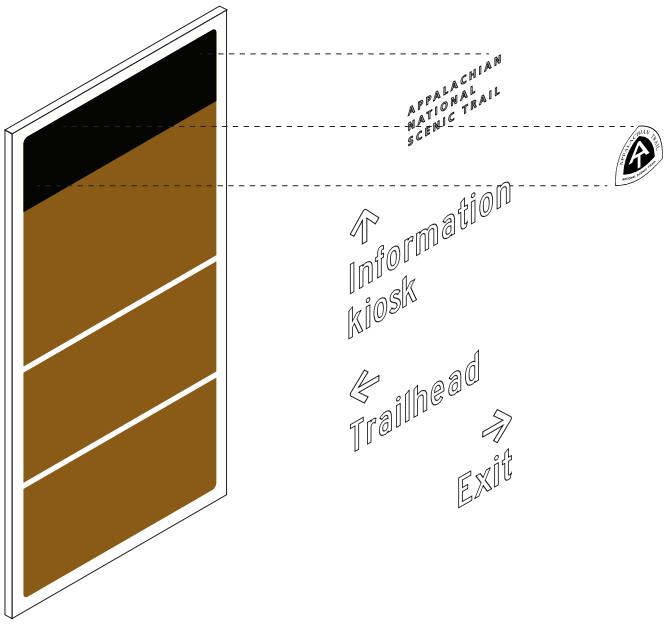


Aluminum panel **painted** with base color (white)

Painted letters dropped out of background color

Vinyl printed individual logos (BW or grayscale)

Option 2 **Intaglio/Vinyl** ••/••

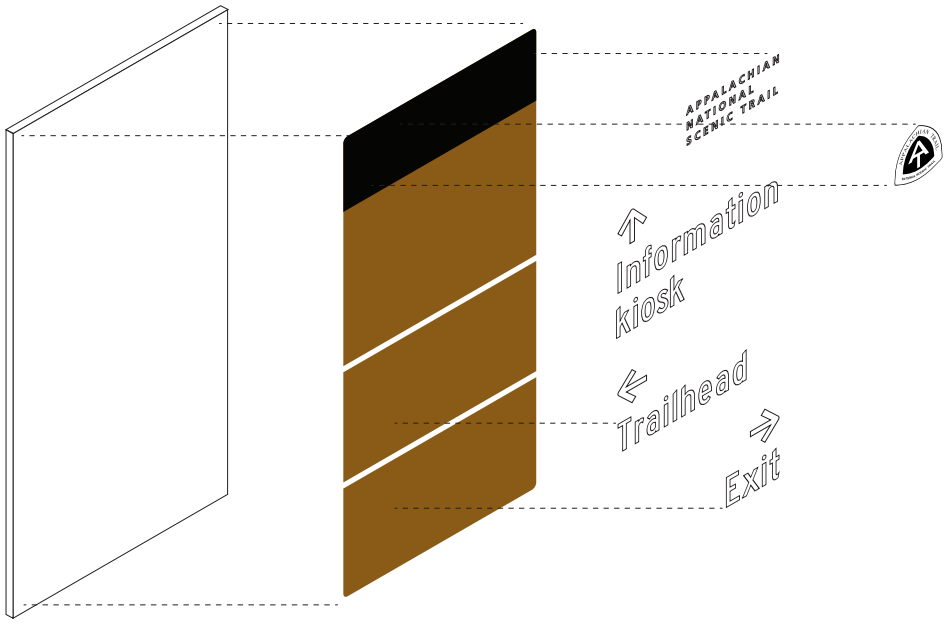


Aluminum panel **painted** with base color (white, brown and black)

Vinyl for letters (white)

Printed **Vinyl** (logo)

Option 3 **Vinyl on Painted Panel** •/•



Aluminum panel **painted** with base color (white)

Vinyl base (brown and black)

Vinyl letters (white)

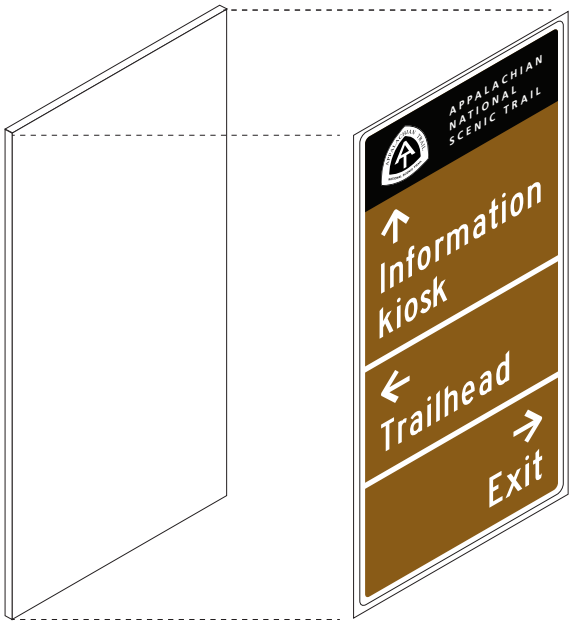
Printed **Vinyl** (logo)

Option 4 **Full Vinyl Print** •/•

Aluminum panel with **vinyl** print

*Can be on flat white, retro reflective, engineer-grade or diamond-grade vinyl.

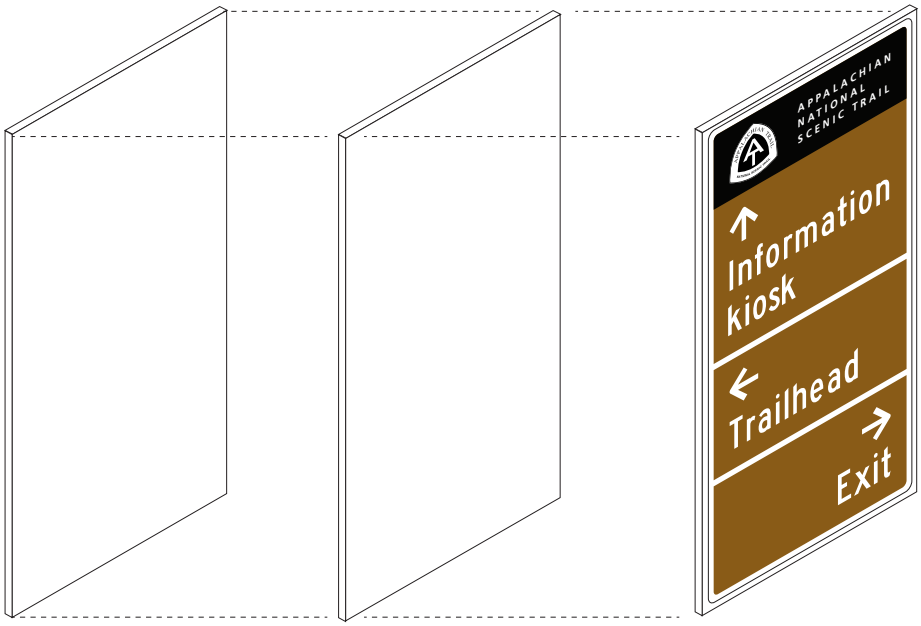
Option 5 **High-Pressure Laminate (0.125" HPL) or Fiberglass (0.090”) with Aluminum Backplate** ••/••



Option 6 **High-Pressure Laminate (0.5" HPL) ••/••**

1/2" pressed structural panel, stand alone

Option 7 **Porcelain Enamel •••/•••**

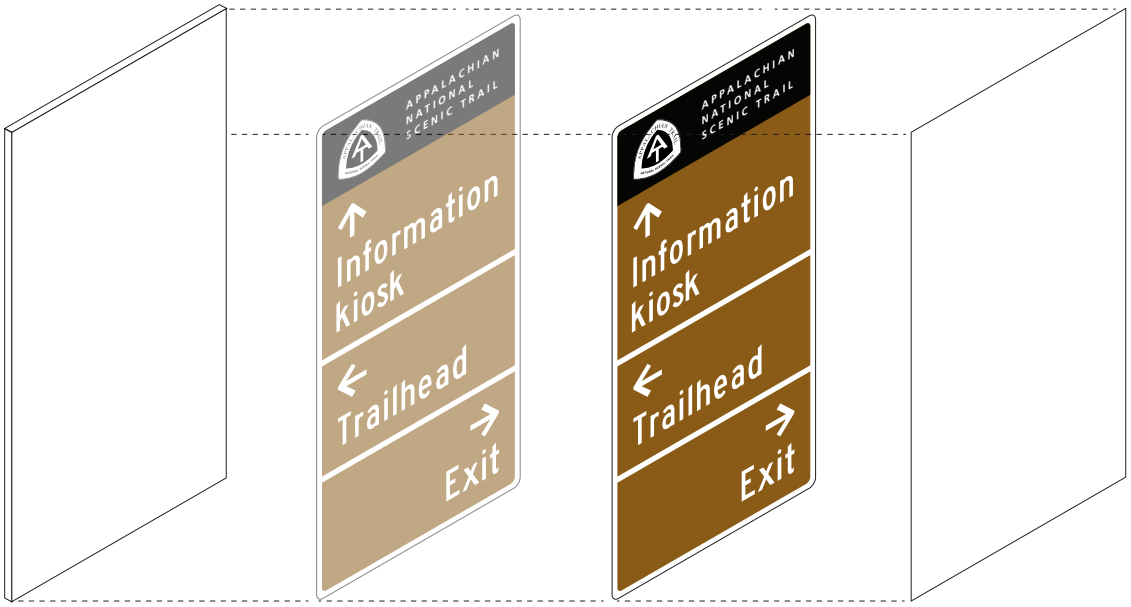


Aluminum panel

Plywood insert for porcelain panel

Steel porcelain panel, with edge returns

Option 8 **Disublimation** ••/••



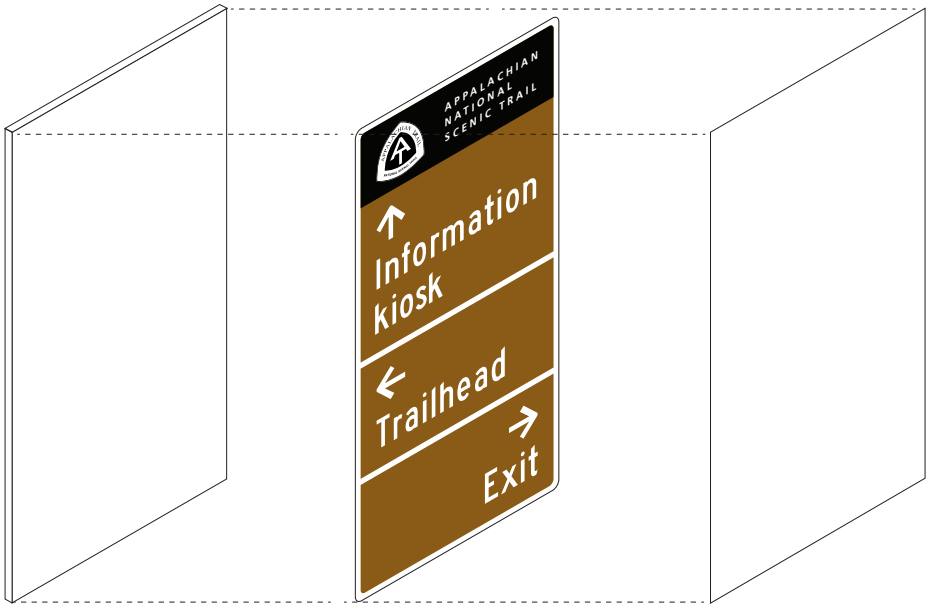
Aluminum panel **powder coated** with base color (white)

Ink is transferred on a carrier and baked into the panel

Design is printed on a carrier sheet

Protective coating is applied to protect the print

Option 9 **Direct Print** ••/••

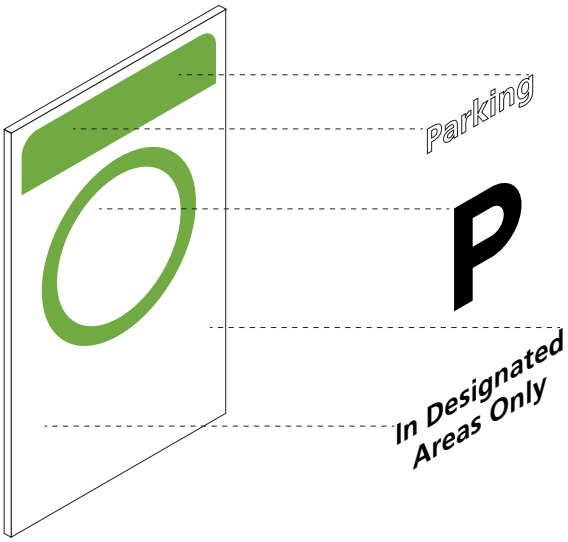


Aluminum panel **painted** with base color (white)

Ink is printed directly onto the panel

Protective coating is applied to protect the print

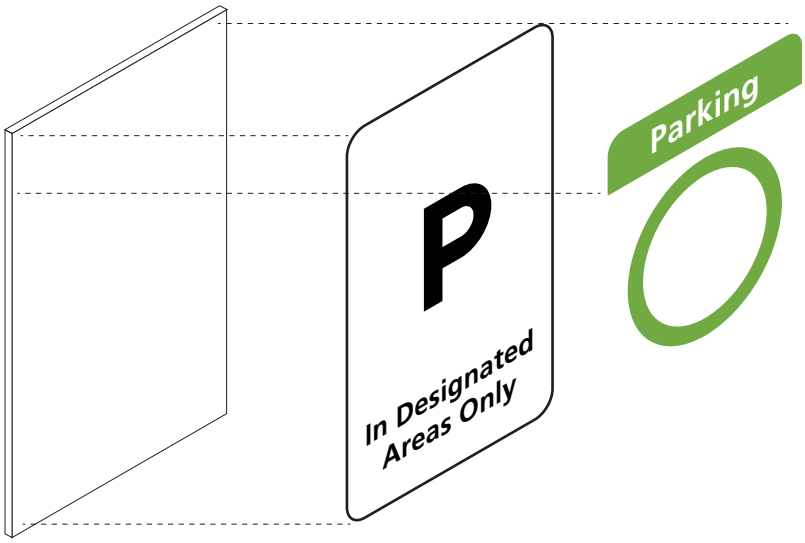
Option 1 **Intaglio/Vinyl ••/••**



Aluminum panel **painted** with base and panel color (white, green)

Vinyl letters (white & black)

Option 2 **Vinyl on Painted Panel •/•**



Aluminum panel **painted** with base color (white)

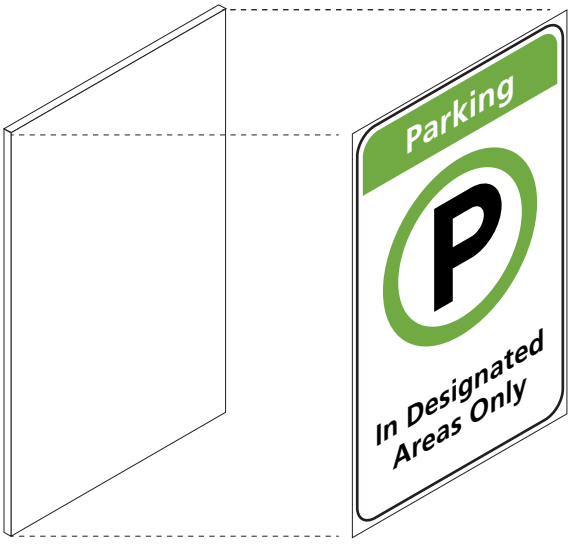
Vinyl letters and base (green and black)

Option 3 **Full Vinyl Print** •/•

Aluminum panel wrapped **vinyl** print

*All edges to be wrapped

Option 4 **High-Pressure Laminate (0.125" HPL) or Fiberglass (0.090”) with Aluminum Backplate** ••/••



Aluminum panel

1/16” pressed panel laminated to aluminum back panel

Option 5 **Disublimation ••/••**

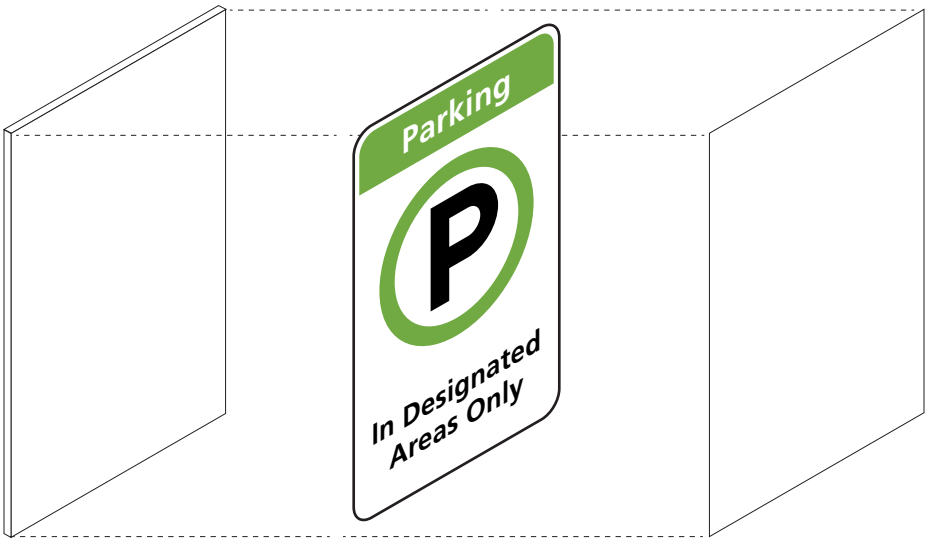
Aluminum panel **painted** with base color (white)

Ink is transferred on a carrier and baked into the panel

Design is printed on a carrier sheet

Protective coating is applied to protect the print

Option 6 **Direct Print ••/••**

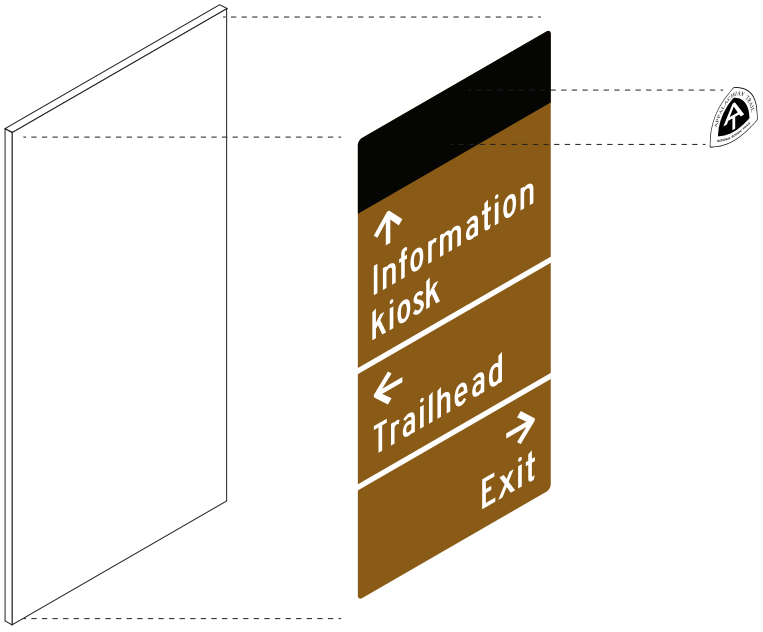


Aluminum panel **painted** with base color (white)

Ink is printed directly onto the panel

Protective coating is applied to protect the print

Option 1 **Intaglio •••/••**

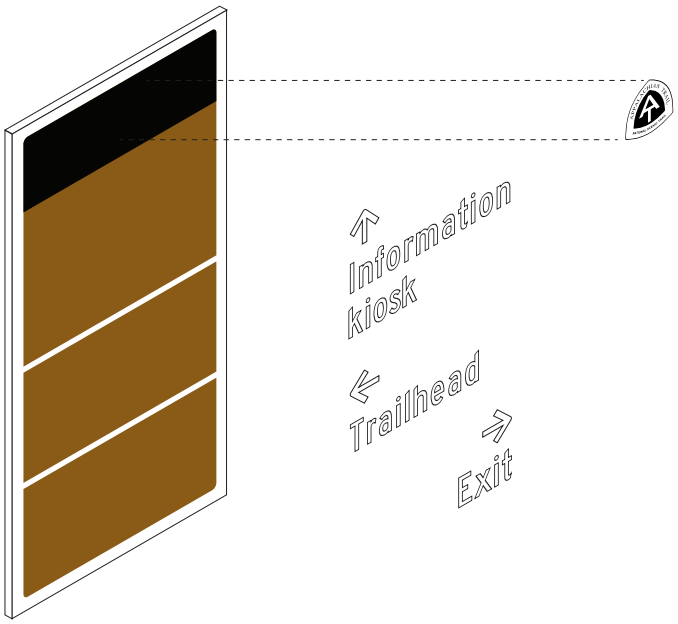


Aluminum panel **painted** with base color (white)

Painted letters dropped out of background color (brown, black)

Vinyl printed individual logos (BW or grayscale)

Option 2 **Intaglio/Vinyl ••/••**

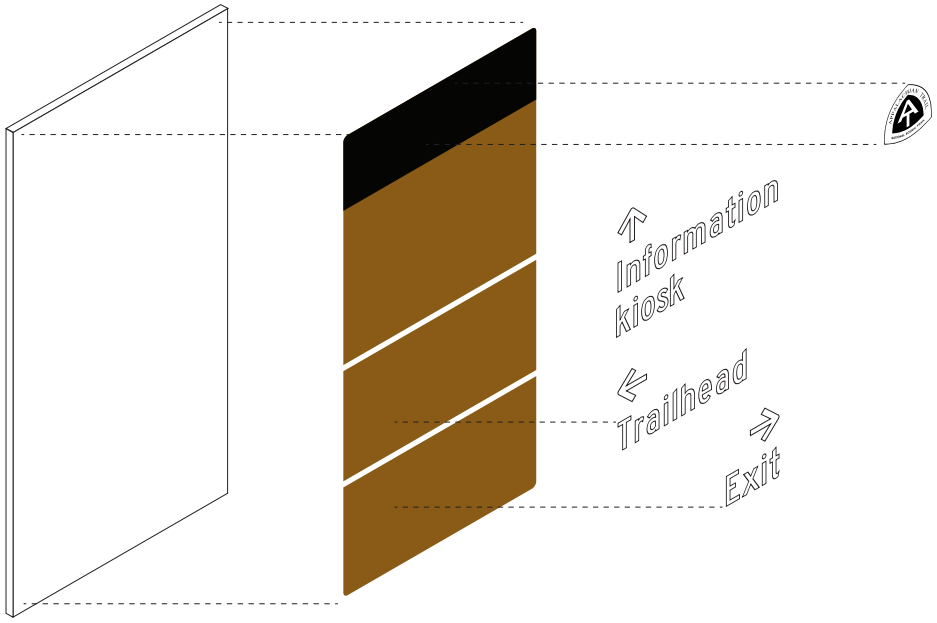


Aluminum panel **painted** with base color (white, brown and black)

Vinyl for letters (white)

Printed **Vinyl** (logo)

Option 3 **Vinyl on Painted Panel** •/•



Aluminum panel **painted** with base color (white)

Vinyl base (brown and black)

Vinyl letters (white)

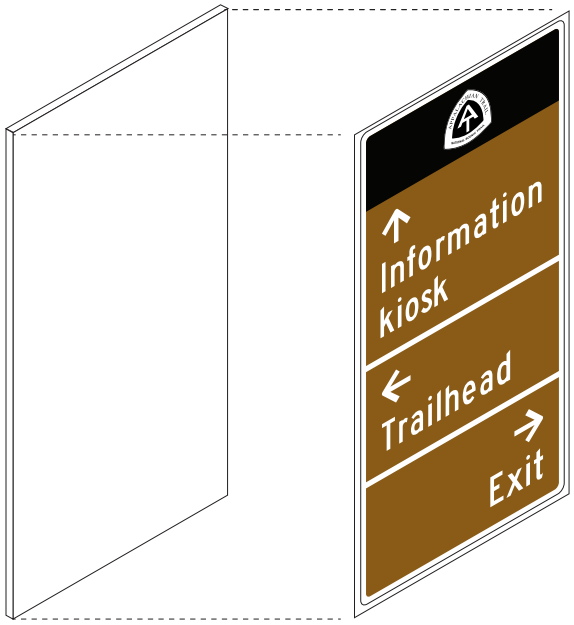
Printed **Vinyl** (logo)

Option 4 **Full Vinyl Print** •/•

Aluminum panel with **vinyl** print

*Can be on flat white, retro reflective, engineer-grade or diamond-grade vinyl.

Option 5 **High-Pressure Laminate (0.125" HPL) or Fiberglass (0.090”) with Aluminum Backplate ••/••**



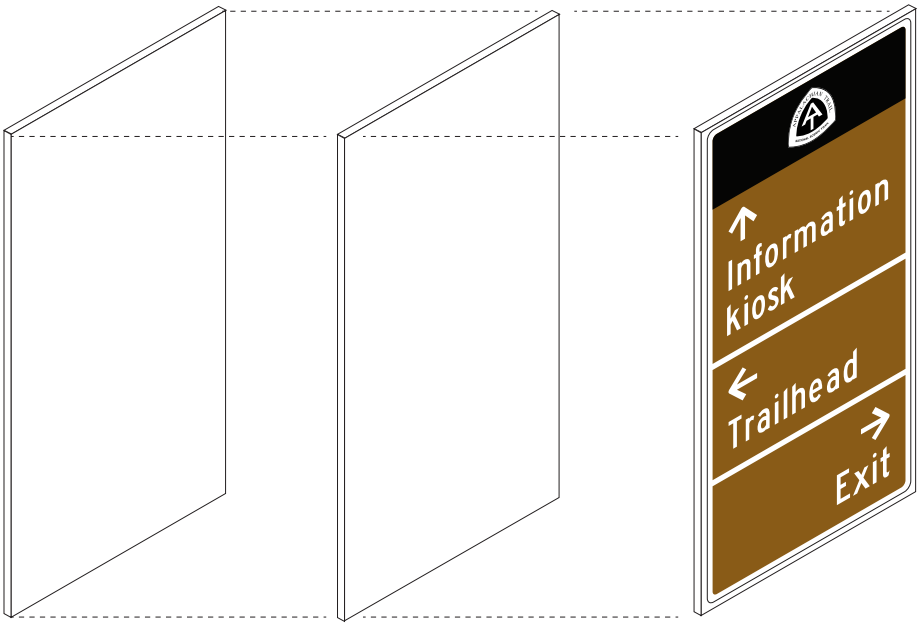
Aluminum panel

1/16” pressed panel laminated to aluminum back panel

Option 6 **High-Pressure Laminate (0.5" HPL) ••/••**

1/2” pressed structural panel, stand alone

Option 7 **Porcelain Enamel** •••/•••

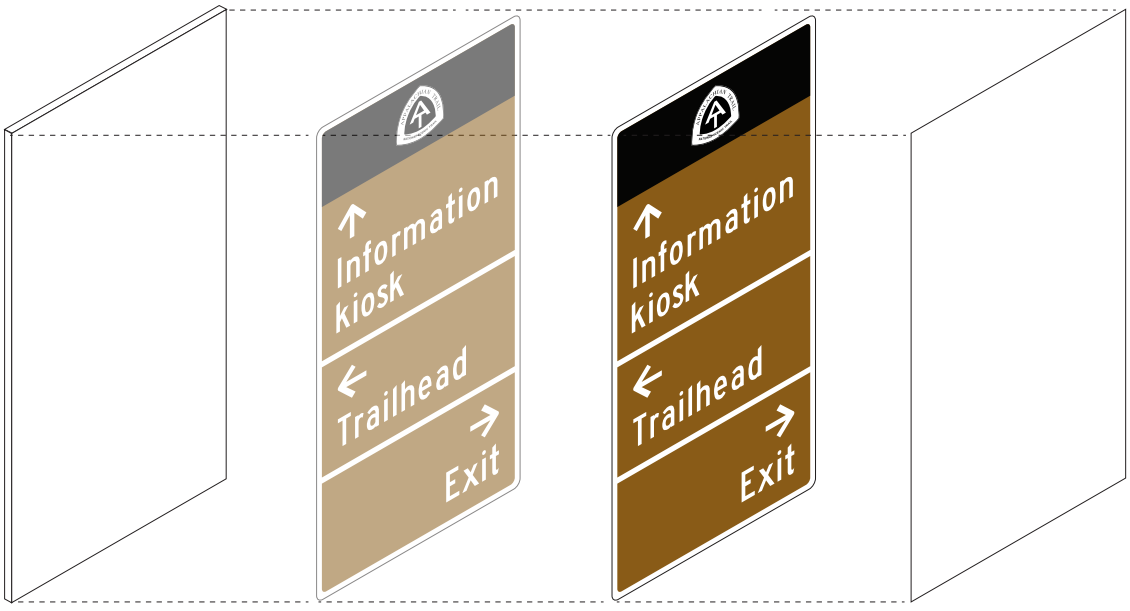


Aluminum panel

Plywood insert for porcelain panel

Steel porcelain panel, with edge returns

Option 8 **Disublimation** ••/••



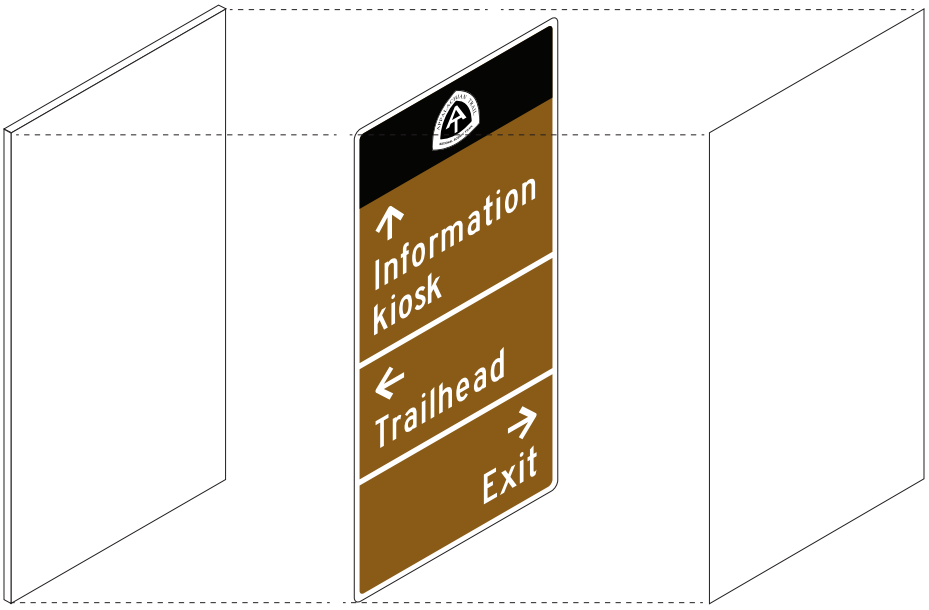
Aluminum panel **powder coated** with base color (white)

Ink is transferred on a carrier and baked into the panel

Design is printed on a carrier sheet

Protective coating is applied to protect the print

Option 9 **Direct Print** ••/••



Aluminum panel **painted** with base color (white)

Ink is printed directly onto the panel

Protective coating is applied to protect the print

INFO Information Kiosk

Option 1 **Full Vinyl Print** •/•

Aluminum panel wrapped **vinyl** print

*All edges to be wrapped

Option 2 **High-Pressure Laminate (0.125" HPL) or Fiberglass (0.090”) with Aluminum Backplate ••/••**

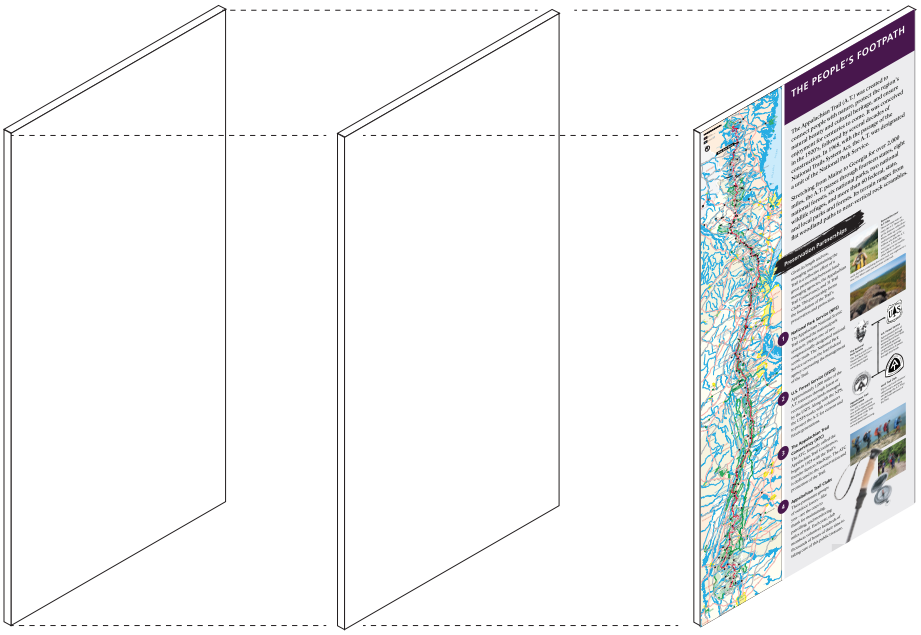
Aluminum panel

1/16” pressed panel laminated to aluminum back panel

Option 3 **High-Pressure Laminate (0.5" HPL) ••/••**

1/2” pressed structural panel, stand alone

Option 4 **Porcelain Enamel** •••/•••



Aluminum panel

Plywood insert for porcelain panel

Steel porcelain panel, with edge returns

Option 5 **Disublimation** ••/••

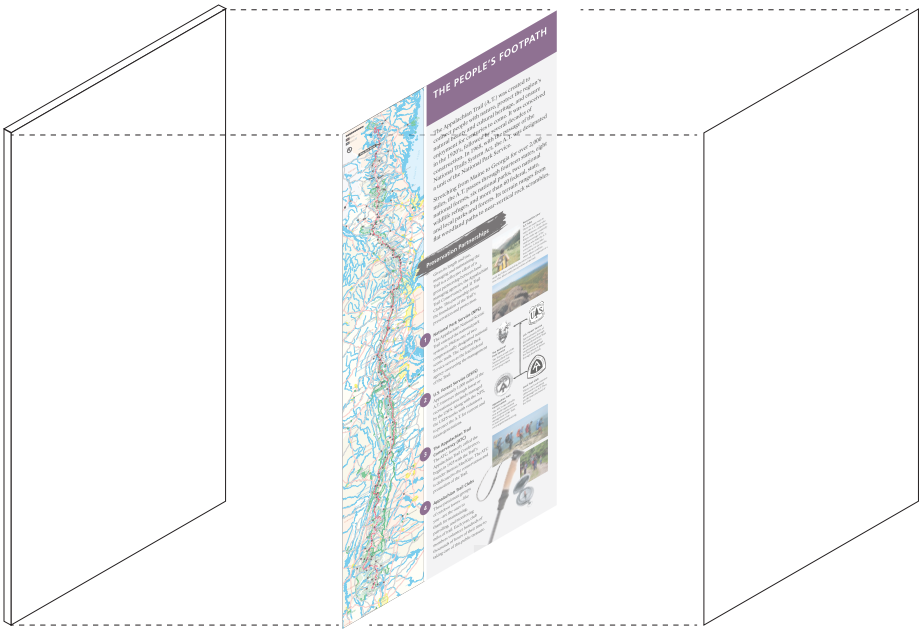
Aluminum panel **powder coated** with base color (white)

Ink is transferred on a carrier and baked into the panel

Design is printed on a carrier sheet

Protective coating is applied to protect the print

Option 6 **Direct Print** ••/••



Aluminum panel **painted** with base color (white)

Ink is printed directly onto the panel

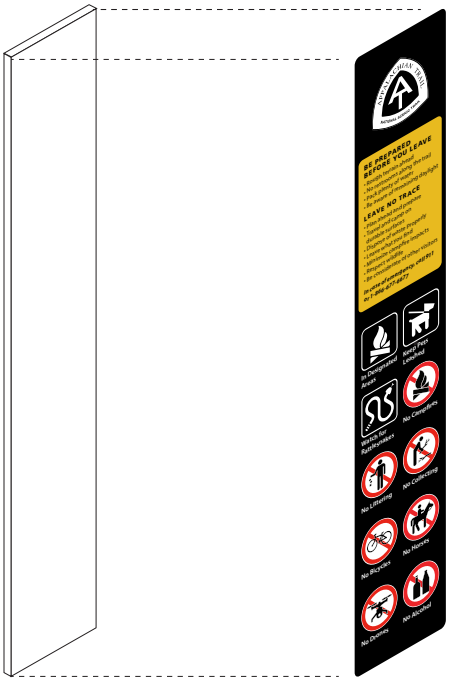
Protective coating is applied to protect the print

ETIQ Etiquette Marker

Option 1 **Full Vinyl Print** •/•

Aluminum panel wrapped **vinyl** print

Option 2 **High-Pressure Laminate (0.125" HPL) or Fiberglass (0.090”) with Aluminum Backplate ••/••**



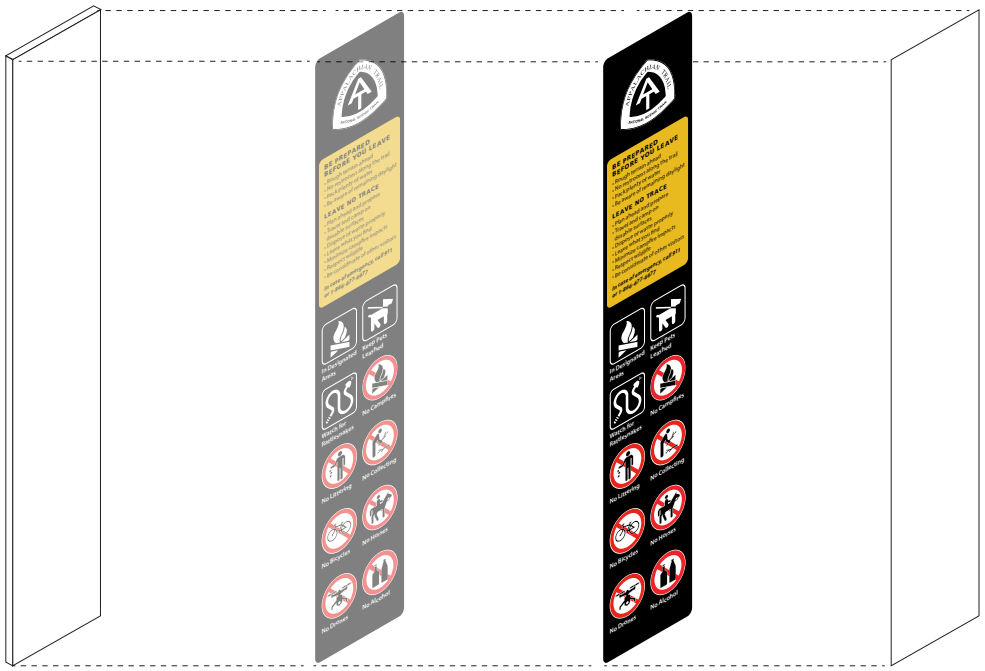
Aluminum panel

1/16” pressed panel laminated to aluminum back panel

Option 3 **High-Pressure Laminate (0.5” HPL) ••/••**

1/2” pressed structural panel, stand alone

Option 4 **Disublimation ••/••**



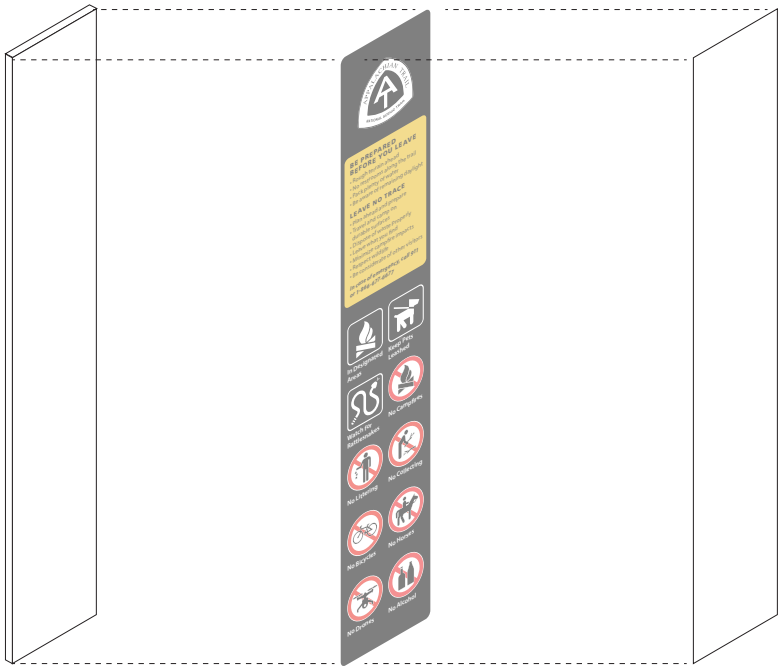
Aluminum panel **powder coated** with base color (white)

Ink is transferred on a carrier and baked into the panel

Design is printed on a carrier sheet

Protective coating is applied to protect the print

Option 5 **Direct Print ••/••**



Aluminum panel **painted** with base color (white)

Ink is printed directly onto the panel

Protective coating is applied to protect the print

Section 7: Installation

Permitting

If a sign is located in the public right of way (ROW), the sign will require a permit from your Department of Transportation.

If the sign is located on National Park Service or U.S. Forest Service land, contact your local agency representative to discuss compliance.

If a sign is located on state property, such as a state park, contact your local state agency representative to discuss any approvals needed.

Signs located on city or county property may or may not require permits. Check with your local permitting office.

Installing signs on private property is discouraged, but if needed may require a memorandum of agreement or a similar legal document to ensure the sign remains in place.

Call Before You Dig

Regardless of where the sign will be situated, **request a locate** before you dig!

Encountering and/or damaging a water, gas, power, signal, or sewer line when you dig may be very expensive. Call 811—the national call center for locates—or visit www.call811.com for more information on your state's requirements for utility locates.

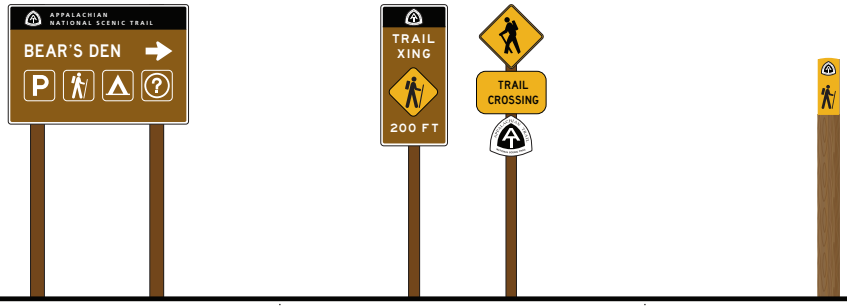
A locate is the process of identifying and marking the position of underground utility lines using electronic locating equipment or records. You will need to know the address of where you plan to dig, including the county and nearest cross street, as well as the type of project you are completing and the exact area on the property where you are planning to dig. Whether you call 811 or make your request online, you will need the same info.

Be aware that privately owned buried facilities (e.g. pool and barbecue lines) may exist within the work area. Public utility companies will not have these on record; you must contact a private locator in this instance.

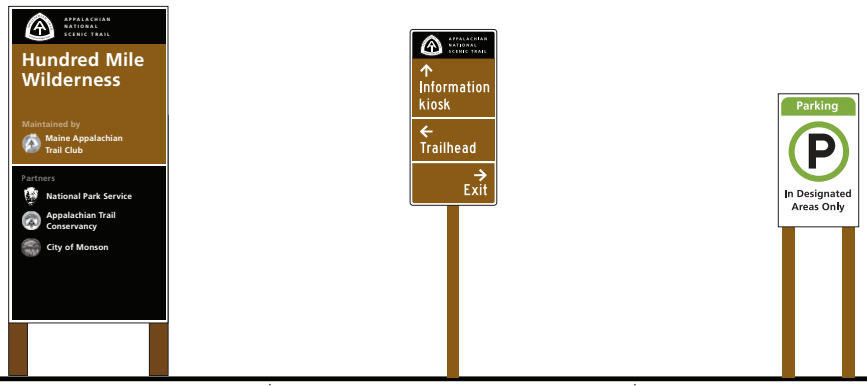
Utilities are marked in the following designated colors as per the American Public Works Association [OAR 952-001-0070 (8)]:

Red	Electric power lines, cables/conduit, lighting cables
Yellow	Gas, oil, steam, petroleum, gaseous materials
Orange	Communication, alarm/signal lines, cables/conduits, fiber
Blue	Potable water
Green	Sewers, drainage facilities or other drain lines
Pink	Temporary survey markings
Purple	Slurry, irrigation and reclaimed water
White	Use white to mark the outer limits of your proposed excavation or mark the centerline and width of proposed lineal installations of buried facilities

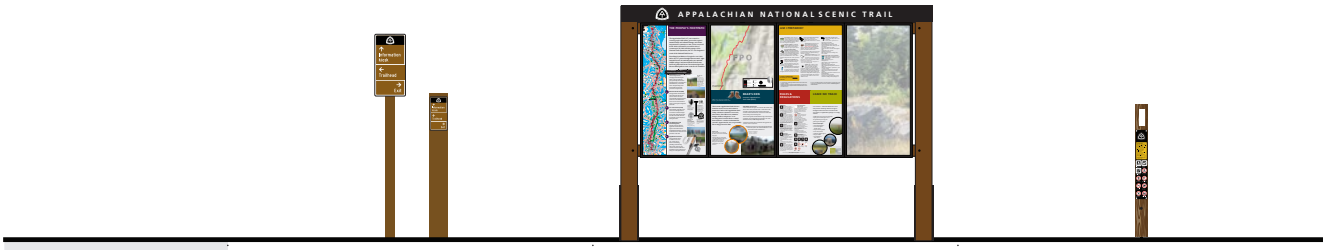
Footing Recommendations



Sign Type	**ADVV** Advanced Vehicular Directional	**ADVT** Advanced Trail Crossing	**XING** Trail Crossing Marker
Material	Direct embedment* or concrete	Direct embedment* or concrete	Concrete or gravel
Sizing	Engineered	12”Ø – 18”Ø sono tube below frost line	Below frost line
Permit Required (City, County or State/DOT)	Likely	Likely	Likely
Engineering	Yes	Yes	No
Notes	These large signs will need to be engineered on a case-by-case basis to account for soil conditions and windload.	Follow your local MUTCD standards for proper sign installations.	Since the sign needs to be seen at the intersection, this sign will likely be in the public right of way.



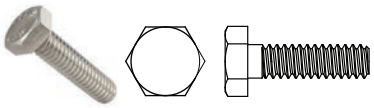
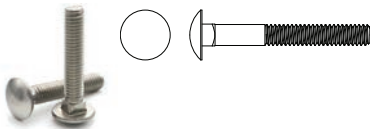
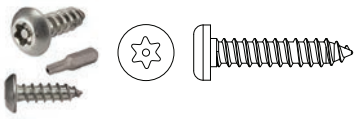
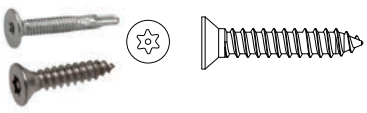
Sign Type	**MAIN** Main Identification	**VEHD** Vehicular Directional	**PARK** Parking Control
Material	Concrete	Concrete or gravel	Direct embedment, concrete or gravel
Sizing	Engineered	Below frost line	Below frost line
Permit Required (City, County or State/DOT)	No	No	Yes on public roads
Engineering	Yes	No	No
Notes	Footing and the sign design will need to be engineered using local materials.	Follow your local MUTCD standards for proper sign installations.	



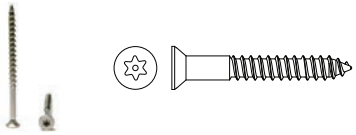
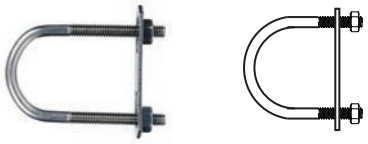
Sign Type	**PEDD** Pedestrian Directional	**INFO** Information Kiosk	**ETIQ** Etiquette Marker
Material	Direct embedment, concrete or gravel	Direct embedment, concrete or gravel	Direct embedment, concrete or gravel
Sizing	Below frost line	12”Ø – 18”Ø sono tube below frost line or on concrete pad	Below frost line
Permit Required (City, County or State/DOT)	No	No	No
Engineering	No	No	No
Notes		This sign type can be installed in existing kiosks, or newly custom sized ones to fit the amount of information displayed.	A variety of material options are available for this sign. Most can use direct embedment.

Appendix

Hardware

Sign Type	Hardware	Common Name	Size Options
ADVV **VEHD** **PARK-G** **PEDD**		Hex head thru-bolt	1/2" - 13 x 5.0" 1/2" - 20 x 5.0"
Item #/Where to Buy item: 92240A750 at https://www.mcmaster.com item: 440178 model: 210267 at Lowes item: 92240A245 at https://www.mcmaster.com			
ADVV **MAIN** **VEHD** **INFO-TRI** **ETIQ**		Vandal resistant machine screws, button head, star and/or torx drive	3/8" - 16 x 2.5" 1/4" - 20 x 1.5"
Item #/Where to Buy item: wgb2183619 at https://www.globalindustrial.com item: 204775128 model: 45760 at Home Depot			
ADVT		Carriage bolt	1/2" - 13 x 3.0" 1/2" - 13 x 3.5" 1/2" - 13 x 4.0"
Item #/Where to Buy item: wgb2183619 at https://www.globalindustrial.com item: 204775128 model: 45760 at Home Depot			
XING **MAIN** **PEDD**		Sheet metal, self-drilling pan head, star and/or torx drive	1/4" x 1.0" #14 (1/4") x 1.0"
Item #/Where to Buy item: 423549 model: 884691 at Lowes item: 204275155 model: 810688 sku: 701217 at Home Depot			
XING **MAIN** **PEDD**		Sheet metal, self-drilling flat head, star and/or torx drive	#12 (1/4") x 1.5" #12 (1/4") x 1.25"
Item #/Where to Buy item: 1147917 model: 116148 at Lowes item: 90925A265 at https://www.mcmaster.com			

Hardware, cont'd

Sign Type	Hardware	Common Name	Size Options
XING **MAIN** **PEDD** **INFO**		Wood screw (aka deck screw), flat head, star and/or torx drive	#10 (3/16") x 1.5" #10 (3/16") x 2.5"
Item #/Where to Buy item: 206677344 model: 4191670500406 sku:1001653686 at Home Depot item: 23199 at https://www.boltdepot.com			
XING **MAIN** **PEDD**		Sheet metal, self-drilling round head, one-way	#12 (1/4") x 1.5"
Item #/Where to Buy item: 204275373 model: 811111 sku: 128032 at Home Depot			
PARK-G		U-bolt	Ø2.5" post
Item #/Where to Buy item: 64874 model: 883301 at Lowes			
ADVV **ADVT** **VEHD**		Locking nut	1/4" - 20 3/8" - 16 1/2" - 13 1/2" - 20
Item #/Where to Buy item: 63403 model: 18014 at Lowes item: 63405 model: 180153 at Lowes item: 63406 model: 180159 at Lowes item: 215567 model: 883189 at Lowes			
ADVV **ADVT** **VEHD**		Tri groove security nut	1/4" - 20 3/8" - 16 1/2" - 13
Item #/Where to Buy item: 90080A240 at https://www.mcmaster.com item: 90080A260 at https://www.mcmaster.com https://www.amazon.com			

Adhesives

Sign Type	Hardware	Common Name	Size Options
ADVV **MAIN** **VEHD** **PARK** **PEDD** **INFO**		Very High Bond (VHB) structural adhesive tape 3m 4949 black	1/2" up to 48" wide

Item #/Where to Buy
contact 3m at 800-362-3550 to find your local representative
www.3m.com/vhb

See attached Technical Data sheet for full specifications and details on proper use.

3M
VHB™ Tape - Specialty Tapes

Technical Data **May 2016**

Product Description:

3M™ VHB™ Tapes provide the convenience and simplicity of a tape fastener and are ideal for use in many interior and exterior bonding applications. In many situations, they can replace rivets, spot welds, liquid adhesives and other permanent fasteners.

These 3M™ VHB™ Tapes are made with acrylic foam which is viscoelastic in nature. This gives the foam energy absorbing and stress relaxing properties which provides these tapes with their unique characteristics. The acrylic chemistry provides outstanding durability performance.

These tapes utilize a variety of specific foam, adhesive, color and release liner types to provide each product/family with specific features. These features can include adhesion to specific or a broad range of materials, conformability, high tensile strength, high shear and peel adhesion, resistance to plasticizer migration, and UL746C recognition. All 3M™ VHB™ Tapes have excellent durability and excellent solvent and moisture resistance.

The tapes included in this data page have unique performance features that are not typically required in most common applications. Please refer to "3M™ VHB™ Tapes" technical data sheet for applications that do not require the special features incorporated in these specialty tapes.

3M™ VHB™ Tape Products

4950 Family

This family has general purpose adhesive on both sides of firm type foam. This family is typically used on metal, glass and high surface energy plastic substrates. Available in white and black.

Tape Number	Color	Thickness in (mm)
4914	White	0.010 (0.25)
4920	White	0.015 (0.4)
4929	Black	0.025 (0.6)
4930(F)	White	0.025 (0.6)
4949	Black	0.045 (1.1)
4950	White	0.045 (1.1)
4955	White	0.080 (2.0)
4959(F)	White	0.120 (3.0)

4945 Family

This family has multi-purpose adhesive on both sides of firm foam.

Tape Number	Color	Thickness in (mm)
4945	White	0.045 (1.1)
4946	White	0.045 (1.1)

4910 Family

This family of clear tapes is excellent for applications where clear or colorless is desired. The general purpose adhesive on both sides is suitable for high surface energy substrates.

Tape Number	Color	Thickness in (mm)
4905	Clear	0.020 (0.5)
4910	Clear	0.040 (1.0)

4951 Family

This family of tapes is based around the low temperature appliable acrylic adhesive system, utilized on both firm and conformable foam types. These products are suitable for high surface energy substrates. Available in white (firm foam) and gray (conformable foam).

Tape Number	Color	Thickness in (mm)
4951	White	0.045 (1.1)
4943F	Gray	0.045 (1.1)
4957F	Gray	0.062 (1.6)

4952 Family

This family utilizes the low surface energy adhesive on a firm foam.

Tape Number	Color	Thickness in (mm)
4932	White	0.025 (0.6)
4952	White	0.045 (1.1)

4611 Family

This family has a general purpose adhesive on both sides of firm foam. This family of tapes is typically used on metal substrates, and has the added feature of high temperature resistance, making it often suitable for bonding prior to high temperature paint processing.

Tape Number	Color	Thickness in (mm)
4611	Dark Gray	0.045 (1.1)
4646	Dark Gray	0.025 (0.6)
4655	Dark Gray	0.062 (1.6)

4622 Family

This family has general purpose adhesive on the face side (the side that typically would be bonded first) and multi-purpose adhesive on the liner side (the side exposed when the release liner is removed) of a conformable foam. Available in white.

Tape Number	Color	Thickness in (mm)
4618	White	0.025 (0.6)
4622	White	0.045 (1.1)
4624	White	0.062 (1.6)

(P) or (F) after the product number designate that both a paper and film liner product version are available. [e.g. 4930 (paper liner) and 4930F (film liner). See page 2 for specific details.

Typical Physical Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

3M™ VHB™ Tapes				Adhesive and Foam			Release Liner		
Family	Number	Color	Tape Thickness Inches (mm) Tolerance	Adhesive Type	Foam Type	Density lb/ft³ (kg/m³)	Type	Thickness Inches (mm)	Color
4950	4914	White	0.010 (0.25) ± 15%	Gen Purp	Firm	50 (800)	DK Paper	0.003 (0.08)	White (printed)
	4920	White	0.015 (0.4) ± 15%	Gen Purp	Firm	50 (800)	DK Paper	0.003 (0.08)	White (printed)
	4929	Black	0.025 (0.6) ± 15%	Gen Purp	Firm	50 (800)	Polyester	0.002 (0.05)	Clear
	4930	White	0.025 (0.6) ± 15%	Gen Purp	Firm	50 (800)	DK Paper	0.003 (0.08)	White (printed)
	4930F	White	0.025 (0.6) ± 15%	Gen Purp	Firm	50 (800)	PE Film	0.005 (0.13)	Red
	4949	Black	0.045 (1.1) ± 10%	Gen Purp	Firm	50 (800)	Polyester	0.002 (0.05)	Clear
	4950	White	0.045 (1.1) ± 10%	Gen Purp	Firm	50 (800)	DK Paper	0.003 (0.08)	White (printed)
	4955	White	0.080 (2.0) ± 10%	Gen Purp	Firm	50 (800)	Polyester	0.002 (0.05)	Clear
	4959	White	0.120 (3.0) ± 10%	Gen Purp	Firm	50 (800)	Polyester	0.002 (0.05)	Clear
	4959F	White	0.120 (3.0) ± 10%	Gen Purp	Firm	50 (800)	PE Film	0.005 (0.13)	Red
4945	4945	White	0.045 (1.1) ± 10%	Multi-Purp	Firm	50 (800)	DK Paper	0.003 (0.08)	White (printed)
	4946	White	0.045 (1.1) ± 10%	Multi-Purp	Firm	50 (800)	PE Film	0.005 (0.13)	Red (printed)
4910	4905	Clear	0.020 (0.5) ± 15%	Gen Purp	Solid	60 (960)	PE Film	0.005 (0.13)	Red (printed)
	4910	Clear	0.040 (1.0) ± 10%	Gen Purp	Solid	60 (960)	PE Film	0.005 (0.13)	Red (printed)
4951	4951	White	0.045 (1.1) ± 10%	Low Temp Appl	Firm	50 (800)	Polyester	0.002 (0.05)	Clear
	4943F	Gray	0.045 (1.1) ± 10%	Low Temp Appl	Conform	45 (720)	Polyester	0.002 (0.05)	Clear
	4957F	Gray	0.062 (1.6) ± 10%	Low Temp Appl	Conform	45 (720)	Polyester	0.002 (0.05)	Clear
4952	4932	White	0.025 (0.6) ± 15%	LSE	Firm	50 (800)	DK Paper	0.003 (0.08)	White (printed)
	4952	White	0.045 (1.1) ± 10%	LSE	Firm	50 (800)	DK Paper	0.003 (0.08)	White (printed)
4611	4611	Dk Gray	0.045 (1.1) ± 10%	Gen Purp	Firm	52 (840)	PE Film	0.005 (0.13)	Red
	4646	Dk Gray	0.025 (0.6) ± 15%	Gen Purp	Firm	52 (840)	PE Film	0.005 (0.13)	Red
	4655	Dk Gray	0.062 (1.6) ± 10%	Gen Purp	Firm	52 (840)	PE Film	0.005 (0.13)	Red
4622	4618	White	0.025 (0.6) ± 15%	Gen/Multi Purp	Conform	45 (720)	PE Film	0.004 (0.10)	Green
	4622	White	0.045 (1.1) ± 10%	Gen/Multi Purp	Conform	45 (720)	PE Film	0.004 (0.10)	Green
	4624	White	0.062 (1.6) ± 10%	Gen/Multi Purp	Conform	45 (720)	PE Film	0.004 (0.10)	Green

Available Sizes

Tape Thickness inches (mm)	Standard Length yards (meters)	Minimum Width inches (mm)	Maximum Width inches (mm)	Maximum Roll Length: Width 1/4"up to 3/8" (6.4mm up to 9.5mm) yards (meters)	Maximum Roll Length: Width >3/8" up to 1/2" (>9.5mm up to 12.7mm) yards (meters)	Maximum Roll Length: Width 1/2" and wider (12.7mm and wider) yards (meters)
0.010 (0.25)	72 (65.8)	0.25 (6)	48 (1219)	72 (65.8)	144 (131.7)	360 (329.2)
0.015 (0.4)	72 (65.8)	0.25 (6)	48 (1219)	144 (131.7)	175 (160.0)	360 (329.2)
0.020 (0.5)	72 (65.8)	0.25 (6)	48 (1219)	72 (65.8)	108 (98.8)	175 (160.0)
0.025 (0.6)	72 (65.8)	0.25 (6)	48 (1219)	72 (65.8)	108 (98.8)	175 (160.0)
0.040 (1.0)	36 (32.9)	0.25 (6)	48 (1219)	72 (65.8)	108 (98.8)	144 (131.7)
0.045 (1.1)	36 (32.9)	0.25 (6)	48 (1219)	72 (65.8)	108 (98.8)	144 (131.7)
0.062 (1.6)	36 (32.9)	0.25 (6)	46 (1168)	72 (65.8)	72 (65.8)	108 (98.8)
0.080 (2.3)	36 (32.9)	0.25 (6)	46 (1168)	36 (32.9)	36 (32.9)	72 (65.8)
0120 (3.0) (4959)	36 (32.9)	0.5 (13)	46 (1168)	N/A N/A	N/A N/A	36 (32.9)
0120 (3.0) (4959F)	36 (32.9)	0.25 (6)	46 (1168)	36 (32.9)	36 (32.9)	36 (32.9)

Slitting Tolerance

Standard slitting tolerance ± 1/32 inch (± 0.031 inch, ± 0.79 mm).

Precision slitting with slitting tolerance of ± 1/64 inch (± 0.016 in., ± 0.41 mm) is available on select products with minimum order of full web increments.

Core Size

All products are provided on a 3 inch ID Core (76.2 mm)

Converted Parts

In addition to standard and custom roll sizes available from 3M through the distribution network, 3M™ VHB™ Tapes are also available in limitless shapes and sizes through the 3M Converter network. For additional information, contact 3M Converter Markets at 1-800-223-7427 or on the web at www.3M.com/converter.

Shelf Life

All 3M™ VHB™ Tapes have a shelf life of 24 months from date of shipment when stored at 40°F to 100°F (4°C to 38°C) and 0-95% relative humidity. The optimum storage conditions are 72°F (22°C) and 50% relative humidity.

Performance of tapes is not projected to change even after shelf life expires; however, 3M does suggest that 3M™ VHB™ Tapes are used prior to the shelf life date whenever possible.

The manufacturing date is available on all 3M™ VHB™ Tape cores as the lot number. The lot number, typically a 4 digit code, is a Julian date (Y D D D). The first digit refers to the year of manufacture, the last 3 digits refer to the days after January 1. Example: A lot number of 9266 would translate to a date of manufacture of Sept. 22 (266th day of year) in 2009. On most products this is found as the 4 digits after the “9” following the product number. For tapes printed continuously around the core (e.g. 3M™ VHB™ Tape 5952 family) the lot number typically will be the string of 4 digits preceding the product number.

Special Cases:

Plasticized Vinyl – Plasticizers compounded in soft vinyl can migrate into adhesives and significantly change their performance characteristics. 3M™ VHB™ Tapes 4945 family has very good plasticizer resistance and adhesion to many vinyl formulations. Because of the wide variation in vinyl formulations, however, evaluation by the user must be conducted with the specific vinyl used to ensure that performance will be satisfactory over time. Problems related to plasticizer migration can often be predicted by accelerated aging of assembled parts at 150°F (66°C) for one week).

Typical Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

3M™ VHB™ Tapes				Dynamic Adhesion Performance		
Family	Product Number	Color	Thickness Inches	90° Peel Adhesion lb/in N/cm	Normal Tensile lb/in² kPa	Dynamic Overlap Shear lb/in² kPa
4950	4914	White	0.010	13 (23)	130 (900)	130 (900)
	4920	White	0.015	15 (26)	160 (1100)	100 (690)
	4929	Black	0.025	20 (35)	160 (1100)	100 (690)
	4930(F)	White	0.025	20 (35)	160 (1100)	100 (690)
	4949	Black	0.045	25 (44)	140 (970)	80 (550)
	4950	White	0.045	25 (44)	140 (970)	80 (550)
	4955	White	0.080	20 (35)	95 (660)	70 (480)
	4959(F)	White	0.062	20 (35)	75 (520)	55 (380)
4945	4945	White	0.045	25 (44)	140 (970)	80 (550)
	4946	White	0.045	25 (44)	140 (970)	80 (550)
4910	4905	Clear	0.020	12 (21)	100 (690)	70 (480)
	4910	Clear	0.040	15 (26)	100 (690)	70 (480)
4951	4951	White	0.045	18 (32)	110 (760)	80 (550)
	4943F	Gray	0.045	20 (35)	85 (590)	70 (480)
	4957F	Gray	0.062	20 (35)	75 (520)	70 (480)
4952	4932	White	0.025	20 (35)	100 (690)	100 (690)
	4952	White	0.045	25 (44)	80 (550)	80 (550)
4611	4611	Dk Gray	0.045	18 (32)	90 (620)	65 (450)
	4646	Dk Gray	0.025	15 (26)	100 (690)	80 (550)
	4655	Dk Gray	0.062	18 (32)	80 (550)	60 (410)
4622	4916	White	0.025	17 (30)	85 (590)	80 (550)
	4622	White	0.045	20 (35)	70 (480)	65 (450)
	4624	White	0.062	20 (35)	55 (380)	60 (410)

90° Peel Adhesion - Based on ASTM D3330 -To stainless steel, room temperature, jaw speed 12 in/min (304.8 mm/min). Average force to remove is measured. 72 hour dwell.

Normal Tensile (T-Block Tensile) - ASTM D-897 - To aluminum, room temperature, 1 in² (6.45 cm²), jaw speed 2 in/min (50.8 mm/min) Peak force to separate is measured. 72 hour dwell.

Dynamic Overlap Shear - ASTM D-1002 - To stainless steel, room temperature, 1 in² (6.45 cm²), jaw speed 0.5 in/min (12.7 mm/min) Peak force to separate is measured. 72 hour dwell.

Typical Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

3M™ VHB™ Tapes				Static Shear					Temperature Tolerance	
Family	Product Number	Color	Thickness Inches	72°F (22°C)	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)	Short Term (Minutes, Hours) °F (°C)	Long Term (Days, Weeks) °F (°C)
4950	4914	White	0.010	1500	500	500			300 (149)	200 (93)
	4920	White	0.015	1500	500	500			300 (149)	200 (93)
	4929	Black	0.025	1500	500	500			300 (149)	200 (93)
	4930(F)	White	0.025	1500	500	500			300 (149)	200 (93)
	4949	Black	0.045	1500	500	500			300 (149)	200 (93)
	4950	White	0.045	1500	500	500			300 (149)	200 (93)
	4955	White	0.080	1500	1000	750	750	750	400 (204)	300 (149)
	4959(F)	White	0.120	1500	1000	750	750	750	400 (204)	300 (149)
4945	4945	White	0.045	1500	500	500			300 (149)	200 (93)
	4946	White	0.045	1500	500	500			300 (149)	200 (93)
4910	4905	Clear	0.020	1000	500	500			300 (149)	200 (93)
	4910	Clear	0.040	1000	500	500			300 (149)	200 (93)
4951	4951	White	0.045	1250	500	500			300 (149)	200 (93)
	4943F	Gray	0.045	1000	500	500			300 (149)	200 (93)
	4957F	Gray	0.062	1000	500	500			300 (149)	200 (93)
4952	4932	White	0.025	1500	500				200 (93)	160 (71)
	4952	White	0.045	1500	500				200 (93)	160 (71)
4611	4611	Dk Gray	0.045	1500	750	750	750	750	450 (232)	300 (149)
	4646	Dk Gray	0.025	1500	750	750	750	750	450 (232)	300 (149)
	4655	Dk Gray	0.062	1500	750	750	750	750	450 (232)	300 (149)
4622	4616	White	0.025	1000	250	250			250 (121)	200 (93)
	4622	White	0.045	1000	250	250			250 (121)	200 (93)
	4624	White	0.062	1000	250	250			250 (121)	200 (93)

Static Shear - ASTM D3654 - To stainless steel, tested at various temperatures and gram loadings. 0.5 in^2 (3.23 cm^2). Will hold listed weight for 10,000 minutes (approximately 7 days). Conversion: 1500 g/0.5 in^2 equals 6.6 lb/in^2; 500 g/0.5 in^2 = 2.2 lb/in^2.

Short Term Temperature Tolerance - No change in room temperature dynamic shear properties following 4 hours conditioning at indicated temperature with 100 g/static load. (Represents minutes, hours in a process type temperature exposure).

Long Term Temperature Tolerance - Maximum temperature where tape supports at least 250 g load per 0.5 in^2 in static shear for 10,000 minutes. (Represents continuous exposure for days or weeks).

Additional Typical Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

	3M™ VHB™ Tape 4950	4910	4611	Units	Test Standard
Dielectric Constant	2.28 1.99	3.21 2.68	2.80 2.43	at 1 kHz at 1MHz	ASTM D150 ASTM D150
Dissipation Factor	0.0227 0.0370	0.0214 0.0595	0.0130 0.0564	at 1 kHz at 1MHz	ASTM D150 ASTM D150
Dielectric Breakdown Strength	18 (460)	25 (630)	13 (330)	V/µm (V/mil)	ASTM D140
Thermal Conductivity (k value)	0.09 (0.6)	0.16 (1.1)	0.11 (0.8)	W/mK (BTU•in/hr•ft²•°F)	
Volume Resisitivity	1.5×10^{15}	3.1×10^{15}	1.4×10^{15}	Ω-cm	ASTM D257
Surface Resisitivity	$>10^{16}$	$>10^{16}$	$>10^{16}$	Ω/sq	ASTM D257
Water Vapor Transmission Rate	14.0			g/m²•day	ASTM F1249 at 38°C/1000% RH
Thermal Properties of Modeling					
Thermal Coefficient of Expansion	180 (100)			10^{-6} m/m/°C (10^{-6} in/in/°F)	
Shear Modulus (at 25°C, 1 Hz)	6×10^5			Pa	
Poisson's Ratio	0.49				

3M™ VHB™ Tapes
UL746C Listings - File MH 17478

Category QOQW2 Component - Polymeric Adhesive Systems, Electrical Equipment

3M™ VHB™ Tapes/ Product Families	Substrates	Temperature Rating Minimum	Maximum
4914, 4920, 4930, 4950	Aluminum, Galvanized Steel, Enameled Steel, Stainless Steel, Ceramic, Glass/Epoxy	-35°C	110°C
	PBT	-35°C	90°C
	ABS, Polycarbonate, Rigid PVC	-35°C	75°C
4920, 4930, 4950,	Acrylic	-35°C	90°C
4955, 4959, 4959F	Glass / Galvanized Steel*, Glass / Glass*, Galvanized Steel / Aluminum*, Aluminum / Aluminum*	-35°C	120°C
4945	Phenolic, Aluminum, Galvanized Steel, Alkyd Enamel, Enameled Steel	-35°C	110°C
	ABS, Polycarbonate, Polyamide, Stainless Steel, Acrylic/Polyurethane Paint, Polyester Paint	-35°C	90°C
	Unplasticized PVC	-35°C	75°C
4905, 4910	Polycarbonate, Aluminum, Acrylic/Polyurethane Paint	-35°C	90°C
4611, 4646, 4655	Stainless Steel, Aluminum, Galvanized Steel, Glass, Glass/Epoxy, Phenolic	-35°C	110°C
	Nylon, Polycarbonate	-35°C	90°C
	ABS, Rigid PVC	-35°C	75°C

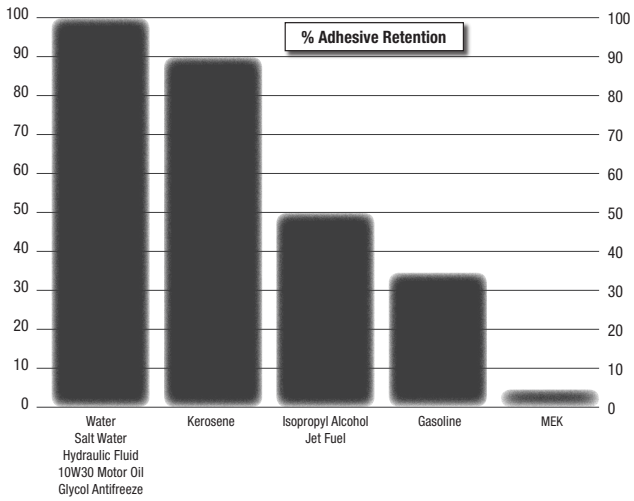
*Substrates can be used with or without primer(s)/Coating. 3M Silane Coating, 3M Adhesion Promoter 4298UV and 3M Tape Primer 94 are used with glass substrate. 3M Primer AP111, 3M Adhesion Promoter 4298UV and 3M Tape Primer 94 are used with aluminum and galvanized steel substrates.

Outgassing

3M™ VHB™ Tapes	% TML	%VCM	%WVR
4930	0.77	0.01	0.21
4932	2.41	0.66	0.23
4945	1.24	0.01	0.19

TML - Total Mass Loss
VCM - Volatile Condensible Materials
WVR - Water Vapor Regained
NASA Reference Publication, "Outgassing Data for Selecting Spacecraft Materials", (11/18/2004)
Available online at http://outgassing.nasa.gov

Solvent and Fuel Resistance



Test Method

- Tape between stainless steel and aluminum foil
- 72 hours dwell at room temperature
- Solvent immersion for 72 hours
- Test within 45 minutes after removing from solvent
- 90° peel angle
- 12 in/min rate of peel
- Peel adhesion compared to control

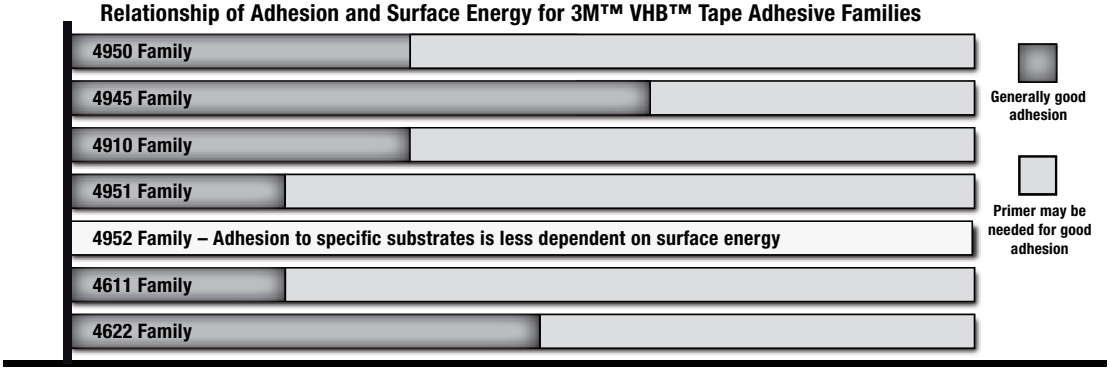
Note: Continuous submersion in chemical solutions is not recommended. The above information is presented to show that occasional chemical contact should not be detrimental to tape performance in most applications in ordinary use.

Design and Tape Selection Considerations

- **Choose the right tape for the substrate:** Adhesives must flow onto the substrate surfaces in order to achieve intimate contact area and allow the molecular force of attraction to develop. The degree of flow of the adhesive on the substrate is largely determined by the surface energy of the substrate.

This illustration demonstrates the effect of surface energy on adhesive interfacial contact. High surface energy materials draw the adhesive closer for high bond strength.

Relationship of Adhesion and Surface Energy for 3M™ VHB™ Tape Adhesive Families



1100-400 (High) | 50-42 | 39-38 (Medium) | 37-36 | 33-18 (Low)

Surface Energy (Dynes/cm)

Aluminum	Polyimide	ABS	PVA	EVA
Stainless Steel	Phenolic	Polycarbonate	Polystyrene	Polyethylene
Copper	Nylon	PVC	Acetal	Polypropylene
Zinc	Alkyd Enamel	PPE	PVDF Paint	PVF
Tin	Polyester	Acrylic	Powder Paint	Silicone
Lead	Epoxy Paint	PU Enamel		PTFE
Anodized Aluminum	Polyurethane	Powder Paint		
Glass				

NOTES: There are a wide variety of formulations, surfaces finishes and surface treatments available on substrate materials which can affect adhesion. This chart is intended to provide only a rough estimate of the adhesion levels which can be expected on some common materials relative to a reference surface such as aluminum.
Foam type can affect and/or limit maximum adhesive strength.

- **Use the right tape thickness:** The necessary thickness of tape depends on the rigidity of substrates and their flatness irregularity. While the 3M™ VHB™ Tapes will conform to a certain amount of irregularity, they will not flow to fill gaps between the materials. For bonding rigid materials with normal flatness, consider use of tapes with thickness of 45 mils (1.1 mm) or greater. As the substrate flexibility increases thinner tapes can be considered.
- **Use the right amount of tape:** Because 3M™ VHB™ Tapes are viscoelastic by nature their strength and stiffness is a function of the rate at which they are stressed. They behave stronger with relatively faster rate of stress load (dynamic stresses) and will tend to show creep behavior with stress load acting over a long period of time (static stresses). As a general rule, for **static loads,** approximately four square inches of tape should be used for each pound (57 cm^2 of tape per kg) of weight to be supported in order to prevent excessive creep. For **dynamic loads,** the dynamic performance characteristics provided on page 4 should be useful, factoring in the appropriate safety factors.
- **Allow for thermal expansion/contraction:** 3M™ VHB™ Tapes can perform well in applications where two bonded surfaces may expand and contract differentially. Assuming good adhesion to the substrates, the tapes can typically tolerate differential movement in the shear plane up to 3 times their thickness.
- **Bond Flexibility:** While an advantage for many applications where allowing differential movement is a benefit, the tape bonds are typically more flexible than alternative bonding methods. Suitable design modifications or periodic use of rigid fasteners or adhesives may be needed if additional stiffness is required.
- **Severe Cold Temperature:** Applications which require performance at severe cold temperatures must be thoroughly evaluated by the user if the intended use will subject the tape product to high impact stresses. A technical bulletin “3M™ VHB™ Tape Cold Temperature Performance” (70-0707-3991-0) is available for additional information.

Application Techniques

► **Clean:** Most substrates are best prepared by cleaning with a 50:50 mixture of isopropyl alcohol (IPA*) and water prior to applying 3M™ VHB™ Tapes.

Exceptions to the general procedure that may require additional surface preparation include:

- **Heavy Oils:** A degreaser or solvent-based cleaner may be required to remove heavy oil or grease from a surface and should be followed by cleaning with IPA/water.
- **Abrasion:** Abrading a surface, followed by cleaning with IPA/water, can remove heavy dirt or oxidation and can increase surface area to improve adhesion. Abrasion is not suggested with 3M™ VHB™ Tapes 4932 and 4952.
- **Adhesion Promoters:** Priming a surface can significantly improve initial and ultimate adhesion to many materials such as plastics and paints.
- **Porous surfaces:** Most porous and fibered materials such as wood, particleboard, concrete, etc. need to be sealed to provide a unified surface.
- **Unique Materials:** Special surface preparation may be needed for glass and glass-like materials, copper and copper containing metals, and plastics or rubber that contain components that migrate (e.g. plasticizers).

Refer to 3M Technical Bulletin "Surface Preparation for 3M™ VHB™ Tape Applications" for additional details and suggestions. (70-0704-8701-5)

***Note:** These cleaner solutions contain greater than 250 g/l of volatile organic compounds (VOC). Please consult your local Air Quality Regulations to be sure the cleaner is compliant. When using solvents, be sure to follow the manufacturer's precautions and directions for use when handling such materials.

► **Pressure:** Bond strength is dependent upon the amount of adhesive-to-surface contact developed. Firm application pressure develops better adhesive contact and helps improve bond strength. Typically, good surface contact can be attained by applying enough pressure to insure that the tape experiences approximately 15 psi (100 kPa) pressure. Either roller or platen pressure can be used. Note that rigid surfaces may require 2 or 3 times that much pressure to make the tape experience 15 psi.

► **Temperature:** Ideal application temperature range is 70°F to 100°F (21°C to 38°C). Pressure sensitive adhesives use viscous flow to achieve substrate contact area. Minimum suggested application temperatures:

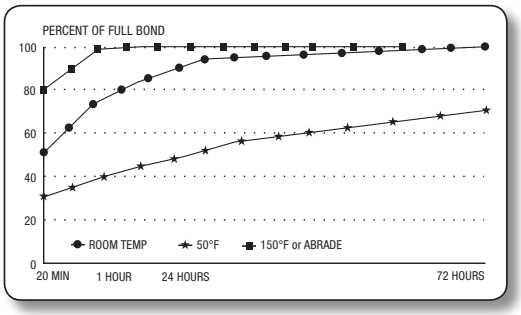
- 50°F (10°C): 3M™ VHB™ Tapes 4950, 4910, 4952, 4611, 4622 families.
- 60°F (15°C): 3M™ VHB™ Tape 4945 family.
- 32°F (0°C): 3M™ VHB™ Tape 4951 family.

Note: Initial tape application to surfaces at temperatures below these suggested minimums is not recommended because the adhesive becomes too firm to adhere readily. However, once properly applied, low temperature holding is generally satisfactory.

To obtain good performance with all 3M™ VHB™ Tapes, it is important to ensure that the surfaces are dry and free of condensed moisture.

► **Time:** After application, the bond strength will increase as the adhesive flows onto the surface (also referred to as "wet out"). At room temperature approximately 50% of ultimate bond strength will be achieved after 20 minutes, 90% after 24 hours and 100% after 72 hours. This flow is faster at higher temperatures and slower at lower temperatures. Ultimate bond strength can be achieved more quickly (and in some cases bond strength can be increased) by exposure of the bond to elevated temperatures (e.g. 150°F [66°C] for 1 hour). This can provide better adhesive wetout onto the substrates. Abrasion of the surfaces or the use of primers/ adhesion promoters can also have the effect of increasing bond strength and achieving ultimate bond strength more quickly.

Bond Typical Build vs. Time



Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use

Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

Limitied Remedy

3M warrants for 24 months from the date of shipment that 3M™ VHB™ Tape will be free of defects in material and manufacture. 3M MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOTLIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. This limited warranty does not cover damage resulting from the use or inability to use 3M™ VHB™ Tape due to misuse, workmanship in application, or application or storage not in accordance with 3M recommended procedures. AN APPLICATION WARRANTY EXPRESSLY APPROVED AND ISSUED BY 3M IS AN EXCEPTION. THE CUSTOMER MUST APPLY FOR A SPECIFIC APPLICATION WARRANTY AND MEET ALL WARRANTY AND PROCESS REQUIREMENTS TO OBTAIN AN APPLICATION WARRANTY. CONTACT 3M FOR MORE INFORMATION ON APPLICATION WARRANTY TERMS AND CONDITIONS.

Limitation of Remedies and Liability

If the 3M™ VHB™ Tape is proved to be defective within the warranty period stated above. THE EXCLUSIVE REMEDY, AT 3M'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OF OR TO REPAIR OR REPLACE THE DEFECTIVE 3M™ VHB™ TAPE. 3M shall not otherwise be liable for loss or damages, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including negligence, warranty, or strict liability.

ISO 9001

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

3M

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