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ARCHITECTS, INC.

# ADA Transit Design Standards Manual for the Kings County Area Public Transit Agency



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# INTRODUCTION

## ABOUT KINGS COUNTY

Located in the San Joaquin Valley of California, Kings County is comprised of the cities of Hanford, Avenal, Corcoran, and Lemoore. The Kings County Area Public Transit Agency (KCAPTA) is fully committed to providing safe and accessible transportation to all people, regardless of ability. The population of Kings County is approximately 150,000 residents. Currently, 12% of this population is over 65 years old. Forty-one percent of the senior population is considered disabled. By 2020, it is projected that this population will grow to 154,403 residents. With this rapidly growing population, Kings County is committed to ensuring that any future transit-related development will provide all individuals, especially those with disabilities, full and equal access to all County services.

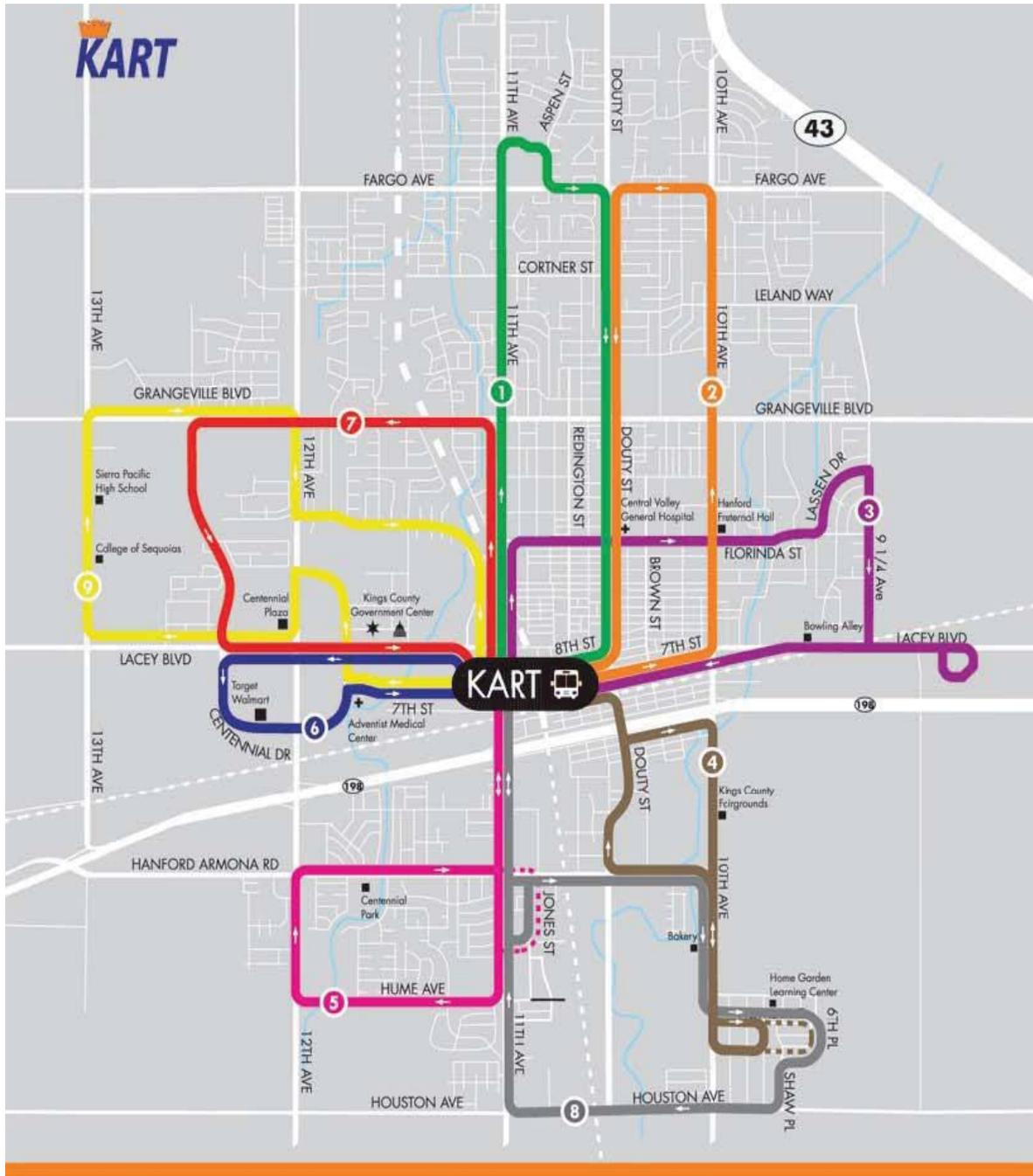
It is especially important that all residents have equal access to the County's public transportation services. Kings Area Rural Transit (KART) provides most of public transit services within Kings County. KART provides local fixed route transportation services to the cities of Armona, Avenal, Corcoran, Grangeville, Hardwick, Hanford, Kettleman City, Laton, Lemoore, and Stratford. Though KART paratransit is currently available to eligible certified ADA passengers, it is important that KART's local fixed route transportation services are also accessible to those with disabilities.

Currently KART operates a paratransit service that is aligned with the Americans with Disabilities Act (ADA) of 1990. The program offers transportation to the ADA certified residents of Kings County in the cities of Hanford, Lemoore, and Avenal. The paratransit service transports riders from their origins to destinations and is available within three quarters of a mile of the local Hanford and the Hanford-Lemoore fixed routes. In terms of operation costs per passenger, the paratransit service is substantially higher (\$26.64 per passenger trip) than the fixed route cost (\$3.63 per passenger trip, Source: Figure 15, 2015 Kings County Final TDP). Without improvements in accessibility to KART's fixed route service, reliance on the paratransit program will continue to grow along with development, population, and the aging demographic in the Kings County region.



Hanford Courthouse, Photo Credit: Kings County

## KART - HANFORD SYSTEM MAP



- 1 Green Line
- 2 Orange Line
- 3 Purple Line
- 4 Brown Line
- 5 Pink Line
- 6 Blue Line
- 7 Red Line
- 8 Gray Line
- 9 Yellow Line

Figure 1-1. KART-Hanford Map, Credit: KART

## PROJECT DESCRIPTION

The purpose of this document is “to develop a design standards manual to provide the Kings County Area Public Transit Agency (KCAPTA) with guidance for the design and coordination of transit facilities with local development, with an emphasis on compliance with the Americans with Disabilities Act (ADA) requirements and the Public Rights-of-Way Accessibility Guidelines (PRoWAG). The completion of this document will help Kings County streamline the implementation of accessible transit related development projects and coordinate such projects with KCAPTA’s ADA infrastructure goals.

The ADA Transit Design Standards Manual identifies and addresses four principal goals for increasing KCAPTA’s accessibility and improving service as it relates to the disabled community. These goals include:

- Meeting the needs of a growing community;
- Meeting legal requirements while planning for future development;
- Making this document an example for other communities to follow; and,
- Creating a living document that will grow and develop along with the region’s transit infrastructure.

This manual should be used as a reference to serve the region as it grows to prevent and identify any potential ADA compliance or service issues regarding transit development. The guidelines address KART’s unique service environment and identifies improvements to accessible transit in both urban and rural service areas. To produce a comprehensive ADA Transit Design Standards Manual that addresses the current and future needs of Kings County’s disabled residents, community input will be incorporated and reflected in the final version of this document. In addition to public input, the ADA Transit Design Standards Manual will follow all applicable codes including ADA, PRoWAG, Manual on Uniform Traffic Control Devices (MUTCD), and California Building Codes (California Code of Regulations, Title 24). While this document will be specific to the Kings County region, the ideas and guidelines identified in this manual could provide guidance to transit agencies that operate in similar transit environments and aim to improve accessibility to their system. Recognizing that both urban development and local population is continuously increasing, this manual is a living document and can be updated to provide for the region’s changing needs.

Common methods of transit development are at times not suited for the rural transit environment of Kings County in which KART operates. Therefore, the implementation of these guidelines by the Kings County Area Public Transit Agency will improve its commitment to keeping the ADA promise of independence for its riders by offering unique solutions to the barriers facing disabled riders. Because the paratransit service offered by KART is much costlier than KART’s fixed route service, it is recommended that Kings County prioritizes making the fixed route service more accessible. The updates and recommendations outlined in this manual could help decrease rider reliance on its paratransit service due to increased accessibility to KART’s fixed route service. In a survey conducted by KART, riders who use the paratransit service stated that the primary reason they use Paratransit, is due to the difficulty in using the fixed route service and the bus stop locations (2015 TDP \_ ES-4).

## KINGS COUNTY STEERING COMMITTEE

- Angie Dow – Kings County Area Public Transit Agency Executive Director
- Terri King – Kings County Association of Governments Executive Director
- Teresa Nickell – Kings County Association of Governments Regional Planner
- Mark Pedreiro – Kings County Area Public Transit Agency Facilities and Fleet Specialist

## STAKEHOLDER INVOLVEMENT

To ensure appropriate access to transportation services throughout Kings County, the Kings County Association of Governments (KCAG) has recognized that stakeholders and community partners play a valuable role by providing critical input and insights into the transportation system. For that reason, a Stakeholder Advisory Committee has been commissioned.

The purpose of this committee is to vet the features and content of the ADA Transit Design Standards Manual. It is recommended that the project Stakeholder Advisory Committee be comprised of members of the core agencies within the Hanford and Lemoore areas. Community members may be recruited from organizations represented in the Community Partners list.

A core membership of seven members, three from government and four from the community, is recommended. Standing committees and ad hoc work groups may be formed, as desirable, to address the mission of the Stakeholder Advisory Committee.

It is recommended that members of the Stakeholders Advisory Committee have no selected authority and that the committee votes by consensus when making decisions. The Committee should meet one to two times via teleconference due to anticipated low participation commonly experienced with the Kings County transit community.

All meetings should be held at sites that are accessible to persons with disabilities, and auxiliary aids and services must be made available to qualified persons with disabilities, upon request, to enable them to participate in Stakeholder Advisory Committee functions. As the Stakeholder Advisory Committee seeks input regarding transit design issues, every effort should be made to obtain perspectives from a diverse group of individuals, including persons with disabilities, aging members of the community, and veterans.

## PUBLIC OUTREACH

On November 27, 2017, the Stakeholder Advisory Committee met to discuss the regional goals of transit within Kings County and to identify present and future needs, deficiencies, and constraints. The first objective of this meeting was to develop and incorporate realistic solutions into this manual to address the mobility needs of all patrons using the KCAPTA system. This objective was met through an open discussion between stakeholders.

The second objective of this meeting was to ensure a broad and diverse participation in the planning process and to gather feedback from patrons using the KCAPTA system to ensure their needs are understood. This objective was met by distributing specific questionnaires to patrons

who currently use the KCAPTA system to learn more about the current ridership and their experience. The following information was learned from this questionnaire:

Table 1-1. Questions and responses from Stakeholder Questionnaire.

<p>How many times a week do you travel?</p>	<p>40% of people surveyed travel 0-3 times per week. 60% of people surveyed travel 4-7 times per week.</p>
<p>Do you make your own travel arrangements or is there someone else who helps you with that?</p>	<p>70% of people surveyed make their own travel arrangements.</p>
<p>Do you typically plan and make your travel arrangements ahead of time or do you spontaneously make your travel arrangements?</p>	<p>84% of people surveyed plan their trips ahead.</p>
<p>What are some of the places and reasons you usually travel? How many times a week do you go there? How far are they from where you live? Do you combine any of these trips?</p>	<p>Answers varied greatly. Common responses include:</p> <ul style="list-style-type: none"> <li>• Out of town</li> <li>• Shopping</li> <li>• Doctor office</li> <li>• Work</li> <li>• Church</li> <li>• Programs</li> <li>• Senior Center</li> </ul>
<p>What is the best and worst part of your typical trip?</p>	<p>Answers varied greatly. Common responses for the best part include:</p> <ul style="list-style-type: none"> <li>• Seeing friends and family</li> <li>• Getting out of the house</li> <li>• Water available for sale at Bus Terminal</li> </ul> <p>Common responses for the worst part include:</p> <ul style="list-style-type: none"> <li>• Not enough shade provided in summer months</li> <li>• Long waiting periods between busses/transfers</li> <li>• Long distances to walk to bus stops</li> <li>• Infrequent service</li> </ul>

<p>Are there times or places you cannot go because there is no way for you to get there? If yes, please briefly explain what they are and why. Examples might be not being able to go shopping on the weekend because of limited bus service.</p>	<p>Answers varied greatly. Common responses include:</p> <ul style="list-style-type: none"> <li>• No Sunday services</li> <li>• Limited Saturday service</li> <li>• Trip duration is long</li> </ul>
<p>Who owns or has access to a car?</p>	<p>11% of people surveyed have access to a car.</p>
<p>What transportation services would help make traveling easier or faster for you? Would you be willing to pay more for improved transportation?</p>	<p>47% of people surveyed responded that they would be willing to pay more for the following:</p> <ul style="list-style-type: none"> <li>• Paratransit</li> <li>• Sunday service</li> <li>• More busses or paratransit</li> </ul>
<p>How do you find and use information about transportation?</p>	<p>Answers varied greatly. Common responses include:</p> <ul style="list-style-type: none"> <li>• Ask driver or other patrons</li> <li>• Schedule/brochures</li> <li>• Friends</li> <li>• Call</li> <li>• Internet at bus station</li> </ul>
<p>Is the information in a format you want? Is it understandable?</p>	<p>41% of people surveyed responded that information was difficult to understand.</p>
<p>Do you have:</p> <ul style="list-style-type: none"> <li>• Access to a telephone?</li> <li>• Access to the Internet?</li> <li>• A cell phone?</li> </ul>	<p>89% of people surveyed have access to a telephone.          60% of people surveyed have access to the internet.          83% of people surveyed have access to a cell phone.</p>
<p>Do you rely on the following to routinely get information about transportation services?</p> <ul style="list-style-type: none"> <li>• Telephone</li> <li>• Cell phone/portable device</li> <li>• Printed information (where do you find it?)</li> </ul>	<p>69% of people surveyed get information from a telephone.          69% of people surveyed get information from a cell phone/portable device.          30% of people surveyed get information from printed information. Patrons typically find this information at the bus station, Senior Center, and within the phone book.</p>

## **STAKEHOLDER ADVISORY COMMITTEE CORE GROUP AND PARTNERS**

### **CORE GROUP:**

#### **Agencies**

COUNTY OF KINGS  
1400 West Lacey Boulevard  
Hanford, CA 93230  
Phone: (559) 852-2700  
Fax: (559) 585-8047

CITY OF HANFORD  
315-321 North Douty Street  
Hanford, CA 93230  
Phone: (559) 585-2500  
Fax: (559) 585-1152

CITY OF LEMOORE  
119 Fox Street  
Lemoore, CA 93245  
Phone: (559) 924-6700  
Fax: (559) 924-9003

#### **Community Partners**

KINGS COUNTY COMMISSION  
ON AGING  
P O Box 598  
Armona, CA 93202  
Phone: (559) 852-4848

KINGS REHABILITATION  
Steve Mendoza, Executive Director  
490 East Hanford Armona Road  
Hanford, CA 93230  
Phone: (559) 583-5051

## ACCESSIBILITY STANDARDS

The ADA prohibits discrimination based on disability, and Title II of the legislation addresses public services provided by public entities, which include transportation. This section of the legislation focuses on the policies and physical aspects, which affect accessibility in the services provided by KART. The accessibility standards incorporated in this manual apply to the fixed route service offered by KART. These standards include:

### PRoWAG Standards:

- Pedestrian access routes
- Sidewalk requirements
- Pedestrian street crossings at a grade
- Curb ramps, ramps, and blended transitions
- Rail crossings
- Overpasses and underpasses
- Elevators and platform lifts
- Doors, doorways, and gates

### ADA Standards:

- Transportation facilities
- Bus boarding and aligning areas (Section 810.2)
- Surfaces (Section 810.2.1)
- Dimensions (Section 810.2.2)
- Connections (Section 810.2.3)
- Slope (Section 810.2.4)
- Bus shelters (Section 810.3)

### California Building Code Standards:

- Transportation facilities
- Vehicle and bus boarding and aligning areas
- Surface
- Connection
- Slope
- Bus shelters
- Bus signs
- Clocks
- Benches
- Clear floor or ground space
- Size, width, and height
- Back support
- Structural strength
- Wet locations

## OVERVIEW OF CONNECTIVITY

Connectivity allows riders to use multimodal transportation and, when effective, can reduce travel time and increase convenience to riders. Outlined in the Circulation Element of the County of Kings 2035 General Plan, good connectivity offers:

- Ease of access
- Ease of navigation
- Similarity to using one mode of transit
- Seamless connections between transit operators

The Kings County area is serviced by four public transit providers that offer multimodal transportation options. These providers include:

Table 2-2. Public transit providers serving the Kings County Area

Provider	Type of Service	Service Area
Amtrak	Passenger Rail	National
Cal Vans	Public Vanpool Program	Kings County
Corcoran Area Transit (CAT)	Fixed Route Service / Paratransit	Corcoran
Kings Area Rural Transit	Fixed Route Service Paratransit	Hanford, Avenal, Corcoran, Laton, Fresno, Visalia, Lemoore

Increasing multimodal connectivity aligns with the KCAG-adopted Sustainable Communities Strategy that promotes increased connections between housing, commercial, and community areas.

Additional benefits to increased connectivity include:

- Improved air quality which helps the region meet their emission reduction standards
- Increased active transportation between housing, commercial, and community facilities
- Encouraged mixed-use development around centers of employment and transit commuter routes.

For the benefits of increased connectivity to be shared by all, public transit providers should ensure that their services are accessible by all members of the public. This starts with ensuring connected accessible routes to all of KART’s transit stops. According to 2010 ADA Accessible Guidelines:

- Bus stop boarding and alighting areas shall be connected to streets, sidewalks, or pedestrian paths by an accessible route complying with Chapter 402 of the 2010 ADA Accessible Guidelines: Accessible Routes.

With properly connected transit stops and accessible routes, riders benefit from increased service accessibility which also allows them to benefit from the overall connectivity of the transit system.

# FINDING DESTINATIONS

## WAYFINDING AND SPATIAL PLANNING

Wayfinding refers to information systems that help people navigate through a physical environment by increasing their knowledge and familiarity of the space. The purpose of wayfinding is to display information at strategic points to guide people in the direction of their destination. Wayfinding should be alive and dynamic for everyone. It is important that all users of varying abilities be easily able to navigate throughout their built environment. By instilling a cognitive identity of a locale, users can use their orientation, in conjunction with wayfinding principles, to better understand their environment.

Successful wayfinding is informed by a variety of factors including orientations, spatial planning, signage, and key decision points. Orientation to persons, places, and times influence the first decision that users (riders) must make. Based on this preliminary decision, users can then begin to make decisions with regards to spatial planning. When incorporating spatial planning into wayfinding, it is important to keep decision making as simple as possible. To avoid confusing sameness in the user's mind, repetitive information should be illuminated, and a variation of design spaces should be utilized. The use of audible and visual environmental cues can be a useful aid in spatial planning in the context of wayfinding. To ensure that wayfinding is accessible to a wide variety of users, it is important to present information in multiple formats. The best wayfinding aids provide simple audible, visual, and tactile cues.

There are many cues that can be used as informational access points upon facility entry. Kiosk cues provide multisensory options for users to look up information and find locations. They can effectively convey information in an accessible manner due to the variety of formats in which information can be provided.

Color cues can be used to provide wayfinding assistance while simultaneously being integrated into the aesthetic vision of the facility. Color cues help to organize facility spaces by providing color-coded visualization and landmarks. In addition, color can affect human emotional response. As a result, it is important to strategically select colors to avoid emotional stress or confusion.



Example of transit wayfinding cue at the T Metro Transit. Photo credit: Kyril Negoda



Large signage provides direction to bus station. Photo credit: Tom Page

Finish materials can also be used as important wayfinding cues. Different finish materials can be useful in differentiating different paths of travel and providing detectable tactile warnings to those with visual impairments.

Architectural features and destination zones can also act as significant wayfinding cues. Memorable features such as bus shelters, benches, and transit signs can help create orientation points for users that will be easy to recall for further navigational use. Destination zones such as transit hubs also provide useful navigational aid by providing central and easy-to-locate congregation and meeting places for riders.

Wayfinding successfully works to help people understand their environment by providing users with adequate information before they enter key decision points. Decision points are locations where an individual can address directional or wayfinding decisions, such as a transit hub bus boarding area.

Successful wayfinding design will inform users about these decision points before they enter their built environment and allow the rider to make informed decisions regarding their travel to improve their overall transit experience.



Large signage clearly marks Brighthouse Bus Station.  
Photo credit: Tim Green

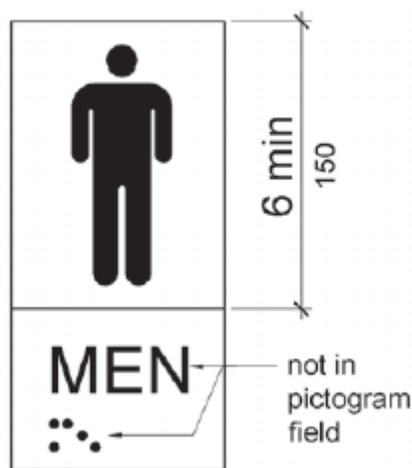
## PICTOGRAMS AND ICONS

### PICTOGRAMS

Pictograms are symbolic representations of information using images. When used in transit systems, pictograms are both clear and concise ways to inform riders of where they are, the type of transit services offered, and if the transit system accommodates disabled riders. Pictograms also move past language and hearing barriers which may present an obstacle for riders. This is especially important within Kings County, where there is a large population of residents that may not understand the English language fluently enough to navigate its transit system using only textual signage. Pictograms present a simple solution to not only effectively inform riders, but also provide universal access to information.

To ensure compliance with ADA standards, the following requirements must be met when using pictograms:

- Pictograms shall have a field height of 6 inches (150 mm) minimum. Characters and Braille shall not be located in the pictogram field.



- Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.

Recommended: Signs are more legible for persons with low vision when characters contrast as much as possible with their background. Additional factors affecting the ease with which the text can be distinguished from its background include shadows cast by lighting sources, surface glare, and the uniformity of the text and background colors and textures.

- 703.6.3 Text Descriptors. Pictograms shall have text descriptors located directly below the pictogram field. Text descriptors shall comply with 703.2, 703.3 and 703.4.

Pictograms and signage should be presented in a clear and consistent manner to provide easy rider identification. When necessary, pictograms can be used with text to further convey their message.

**SYMBOLS OF ACCESSIBILITY**

When identifying accessibility services through signing conventions the following symbols should be used to comply with the 2010 ADA Accessible Guidelines (ADAAG) criteria:

703.7.2.1 International Symbol of Accessibility (ISA). The ISA shall comply with the below figure:



703.7.2.2 International Symbol of Talk to Text (TTY). The International Symbol of TTY shall comply with the below figure:



703.7.2.3 Volume Control Telephones. Telephones with a volume control shall be identified by a pictogram of a telephone handset with radiating sound waves on a square field, such as shown in the below figure:



703.7.2.4 Assistive Listening Systems (ALS). ALS shall be identified by the ISA for Hearing Loss complying with the below figure:



703.7 Symbols of Accessibility. Symbols of accessibility shall comply with 703.7.

703.7.1 Finish and Contrast. Symbols of accessibility and their background shall have a non-glare finish. Symbols of accessibility shall contrast with their background with either a light symbol on a dark background or a dark symbol on a light background.

Advisory 703.7.1 Finish and Contrast. Signs are more legible for persons with low vision when characters contrast as much as possible with their background. Additional factors affecting the ease with which the text can be distinguished from its background include shadows cast by lighting sources, surface glare, and the uniformity of the text and background colors and textures.

In addition to identifying accessibility services, pictograms can be used to inform all riders about transit types, where services are provided, and improve navigation of the transit system.

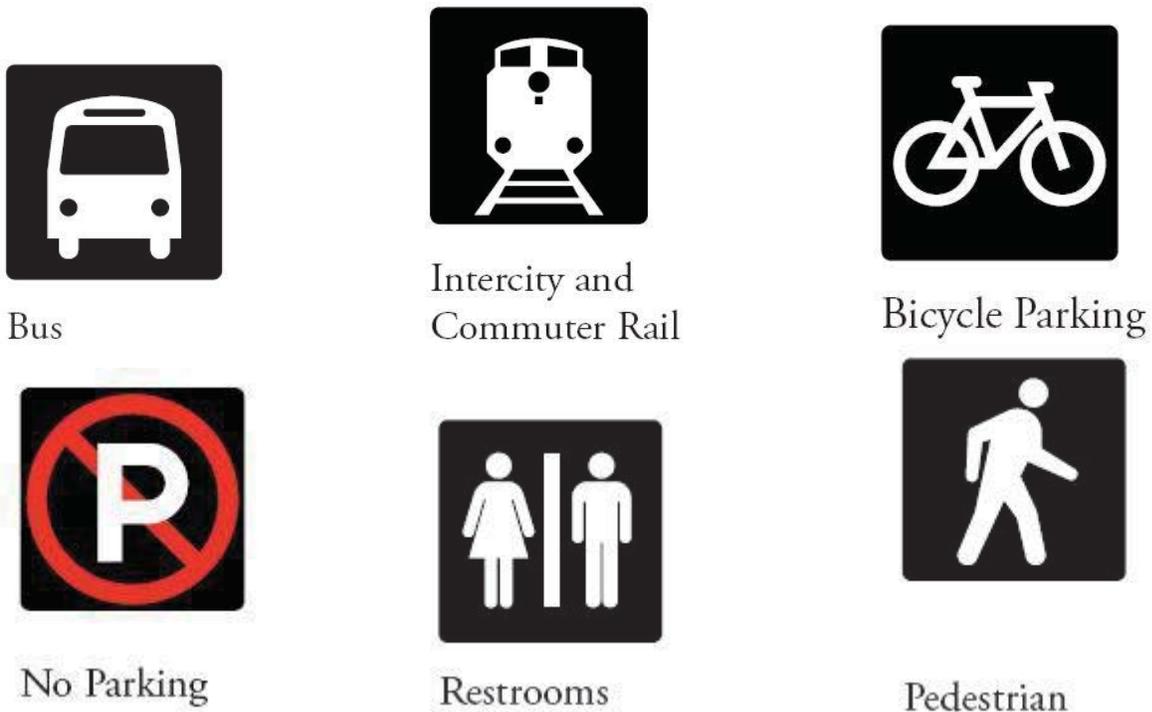


Figure 2-1: Example Pictograms  
 Source: Regional Transit Wayfinding Guidelines & Standards

## DIRECTIONAL ARROWS

Directional arrows provide vital directional information to riders navigating the transit system. This system transcends language barriers and helps inform riders of major destinations or places of interest. Directional arrows should be used following a consistent standard to efficiently convey information and should be placed at decision points wherever possible. When used with other signage conventions, directional arrows enhance wayfinding and effectively direct riders towards their destinations or transit connections. It is recommended that directional arrows are incorporated into KART’s signage system to improve wayfinding and to increase accessibility.

Direction	Pictogram	Usage
Up		Use at foot of stairs or escalator to indicate destination on upper level; proceed upward.  May also be used to indicate destination ahead; proceed in a forward direction.
Left		Destination to the left; turn left at this point; or turn left immediately.
Down		Use at head of stairs or escalator to indicate destination on the lower level of a multi-level hub; proceed downward.
Right		Destination to the right; turn right at this point; or turn right immediately.

Figure 2-2. Wayfinding signs which combine Directional Arrows, Pictograms and Text  
Credit: Regional Transit Wayfinding Guidelines & Standards

Providing signage that incorporates both directional arrows and pictograms within a transit station connects riders to fixed route and paratransit transit stops, exits, ground transportation pick-up areas, car-sharing pick-up/drop-off, taxi stands, shuttles and other transportation modes. Along the route, wayfinding signage should be repeated to assure patrons to stay the course and prepare for

next move. Using pictograms and directional arrows in wayfinding helps ensure riders are informed and allows for riders to easily navigate the transit system, regardless of familiarity.



Wayfinding signs which combine Directional Arrows, Pictograms and Text  
Image Credit: SSA

## MESSAGE CONVENTIONS

Signs describing transit stops, features, and locations should be provided in a clear and concise method that omits any unnecessary information or wording. When using message conventions, such as nomenclature and abbreviations, the following information is recommended:

### NOMENCLATURE

The words used to identify features, functions, and destinations in signage should be consistent across all signs in a station and across all stations.

Prepositions are omitted at the beginning of a message. Example: “Hanford”, not “To Hanford”.

Either use the phrase “All Destinations” or list the actual destinations associated with the boarding locations.

## ABBREVIATIONS

Use an ampersand “&”, instead of the word “and”, when connecting two words which naturally belong together because of similarity of function or geographical proximity.



Effective informational signage.

Photo credit: MTC Regional HUB Signage Standards 2012

## SIGNAGE

Signage cues usually provide the earliest identification of key decision points. Signage cues help users to direct and orient themselves, find their destinations, and identify their spaces. In addition, signage can be easily updated to inform users of current or future events or activities within the facility. Furthermore, signage acts as an important detectable key in circulation throughout transportation hubs.

Because of the vital role signage plays in wayfinding, it is critical that consistency and accessible design are carefully considered before implemented in a transit station. Developing a standard for signage and wayfinding can help riders easily identify important information while using KART's system.

It is extremely important that each bus stop is clearly marked with signage that distinguishes which buses serve each stop. Kings County currently has 250 bus stops, complete with signs and poles. It is

imperative that these signs and poles are placed at every transit stop, between services, and at major decision points to support best wayfinding practices.

Although there are no current codes outlining specific colors associated with associable informational signage, it is important that text and background colors are contrasting, with either dark text on a light background or light text on a dark background.



Effective informational signage

Photo credit: Metropolitan Transportation Authority of the State of New York

To comply with the 2016 California Building Code, bus route identification signs must comply with the following:

- Characters and their background shall have a non-glare finish. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.
- Characters shall be uppercase or lowercase or a combination of both.
- Characters shall be conventional in form. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.
- Characters shall be selected from fonts where the width of the uppercase letter “O” is 60 percent minimum and 110 percent maximum of the height of the uppercase letter

“l”.

- Minimum character height shall comply with Table 11B-703.5.5. Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign. Character height shall be based on the uppercase letter “l”.

Table 2-1. Table 11B-703.5.5 of the 2016 California Building Code

Height to Finish Floor or Ground From Baseline of Character	Horizontal Viewing Distance	Minimum Character Height
40 inches (1016 mm) to less than or equal to 70 inches (1778 mm)	less than 72 inches (1829 mm)	5/8 inch (15.9 mm)
	72 inches (1829 mm) and greater	5/8 inch (15.9 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 72 inches (1829 mm)
Greater than 70 inches (1778 mm) to less than or equal to 120 inches (3048 mm)	less than 180 inches (4572 mm)	2 inches (51 mm)
	180 inches (4572 mm) and greater	2 inches (51 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 180 inches (4572 mm)
greater than 120 inches (3048 mm)	less than 21 feet (6401 mm)	3 inches (76 mm)
	21 feet (6401 mm) and greater	3 inches (76 mm), plus 1/8 inch (3.2 mm) per foot (305 mm) of viewing distance above 21 feet (6401 mm)

Exception: Bus schedules, timetables and maps that are posted at the bus stop or bus bay shall not be required to comply.

To comply with the 2010 ADA Accessible Guidelines, transit station signs must comply with the following:

- Where signs identify a station or its entrance, at least one sign at each entrance shall be placed in uniform locations to the maximum extent practicable. Where signs identify a station that has no defined entrance, at least one sign shall be placed in a central location.
- Lists of stations, routes and destinations served by the station which are located on boarding areas, platforms, or mezzanines shall comply with 703.5. At least one tactile sign identifying the specific station and complying with 703.2 shall be provided on each platform or boarding area. Signs covered by this requirement shall, to the maximum extent practicable, be placed in uniform locations within the system.

EXCEPTION: Where sign space is limited, characters shall not be required to exceed 3 inches.

- Route maps are not required to comply with the informational sign requirements
- Signs shall be clearly visible and within the sight lines of standing and sitting passengers from within the vehicle on both sides when not obstructed by another vehicle.

- It is also important to place signs at intervals in the station where passengers in the vehicle will be able to see a sign when the vehicle is either stopped at the station or about to come to a stop in the station. The number of signs necessary may be directly related to the size of the lettering displayed on the sign.
- Where public address systems convey audible information to the public, the same or equivalent information shall be provided in a visual format.
- Where clocks are provided for use by the public, the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals and digits shall contrast with the background either light-on-dark or dark-on-light. Where clocks are installed overhead, numerals and digits shall comply with 703.5.
- Characters and their background shall have a non-glare finish. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

# STREET-SIDE INFRASTRUCTURE DESIGN

Street-side infrastructure design includes aspects of the transit system that are within the travel way. This includes roadway requirements, fleet characteristics, transit stop locations, and identification.

## ROADWAY REQUIREMENTS

### STREET PAVEMENT DESIGN

Pavement should be strong enough to hold a transit vehicle that is at capacity (TARC: Transit Design Standards Manual, page 14). Areas to focus pavement improvements should be centered on areas where buses start, stop, and turn to best accommodate transit vehicles. Asphalt is subject to warping and can lose a level surface when put under stress and/or is heated. Buses can cause surface issues within asphalt for these reasons. Bus pads made of reinforced concrete that run the full length of the bus provide a solution to pavement failure problems. Each pavement design should be site and soil specific yet should be able to accommodate large repetitive loads (up to 25,000 pounds) to be effective (TCRP Report 19, page 43). Bus pads can be used by KART for bus stops that service a high volume of riders.

All Roadway construction should follow standards set by Kings County Improvements Standards section 302. B. These standards include:

- “B” type asphalt concrete, Class 2 aggregate base, Class 3 aggregate subbase
- AR-4000 type paving asphalt
- Aggregate and asphalt mix shall not have more than a 15-gram loss when subjected to surface abrasion tests

### ROAD WIDTHS

Roadway construction should comply with all appropriate regulations and provide wide enough clearance for fixed route transit vehicles. In some cases, roadway widths cannot accommodate the turning radius of a large bus, causing various service issues. Transit vehicles that are incapable of navigating their roadways with adequate space face increased safety and financial risks caused by side-swiping collisions. Roadways not meeting width standards limit KART’s ability to service regions where fixed route transportation is needed. As a result, riders may have to travel further to reach a transit stop which can create a barrier to service for disabled riders, where distance is an issue. Roads that are inaccessible to KART’s fixed route vehicles also present limitations to transit routes that result in longer and more indirect routes, which can increase travel times and decrease ridership. Proper steps should be taken to ensure that all roads in Kings County comply with State and local regulations as well as provide needed clearance for KART’s vehicles.

In Kings County, street standards and construction regulations vary from city to city. For the

communities in unincorporated areas of Kings County, the County standards apply to roadways. For the unincorporated cities of Kettleman, Stratford and Armona, roadways should comply with the Kings County Public Works Improvement Standards document, Section 202 for roadway improvements. Figures 3-1 and 3-2 provide the three types of local roadways that service the Kings County region. Street width requirements are as follows:

<b>Minor Roads</b>	40 Feet
<b>Collector Roads</b>	64 Feet
<b>Arterial Roads</b>	84 Feet

Figure 3-1. Kings County roadway widths  
 Source: Kings County Public Works Improvement Standards

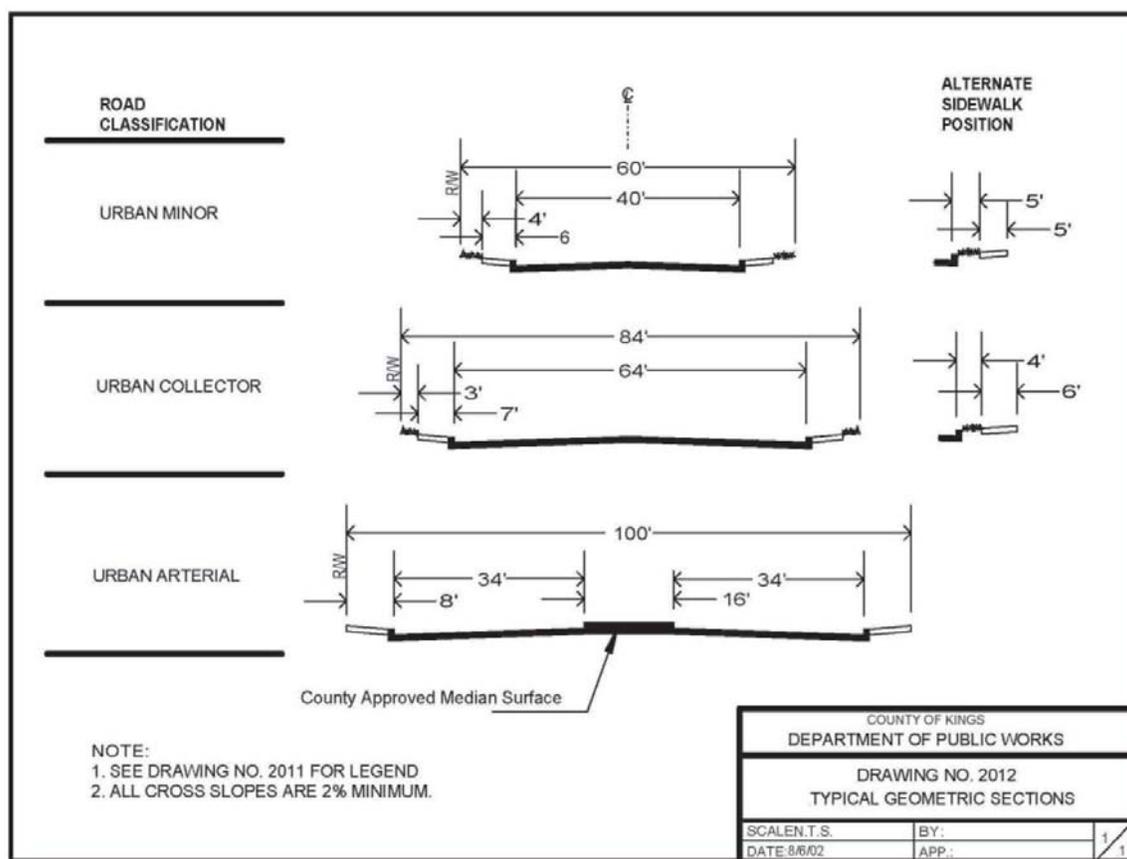


Figure 3-2. Kings County Roadway Widths Standards  
 Source: Kings County Public Works Improvement Standards

For the incorporated cities of Hanford, Lemoore, Avenal and Corcoran, the roadway standards and specifications are as follows:

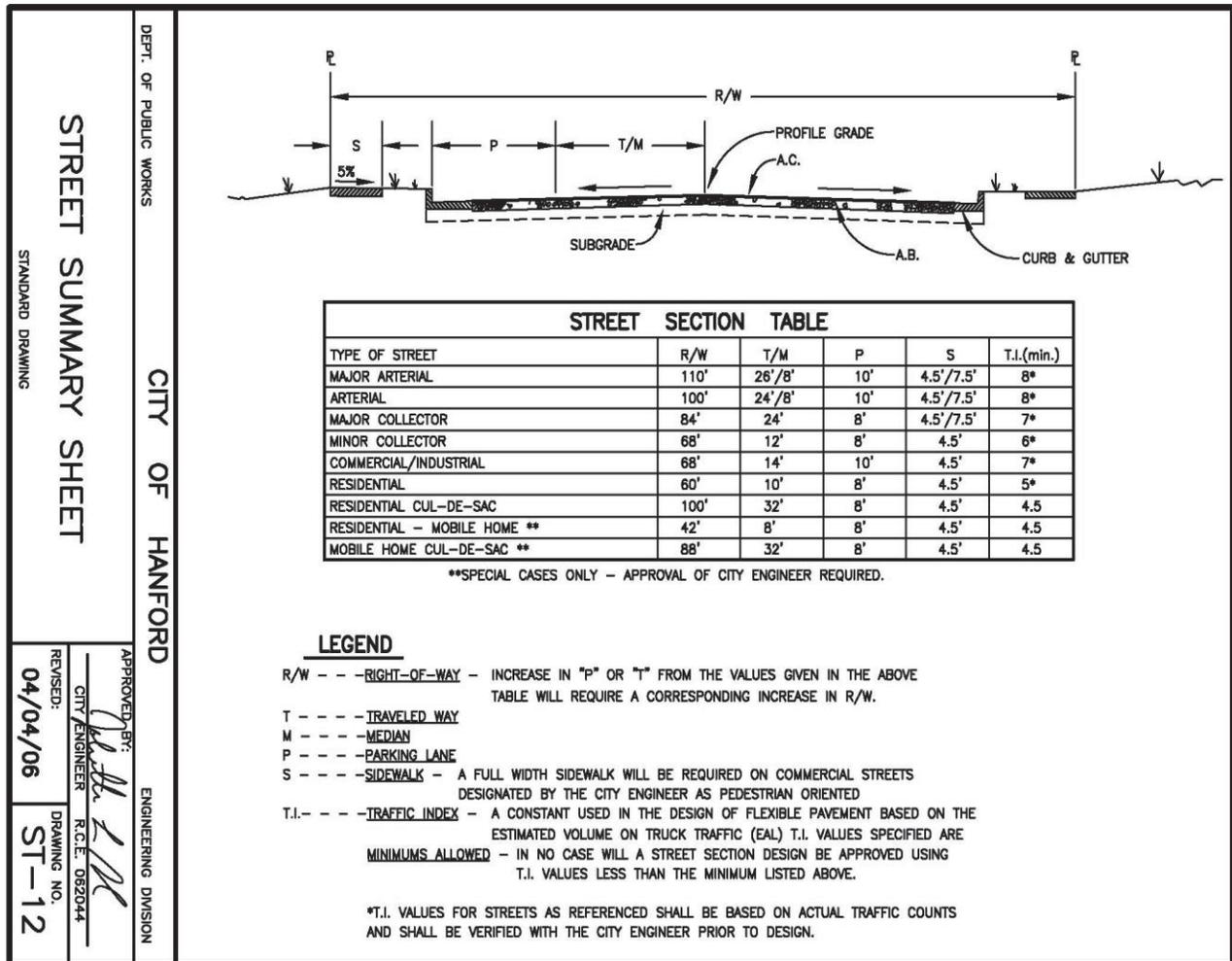


Figure 3-3. City of Hanford Street Requirements  
 Source: Kings County Public Works Improvement Standards

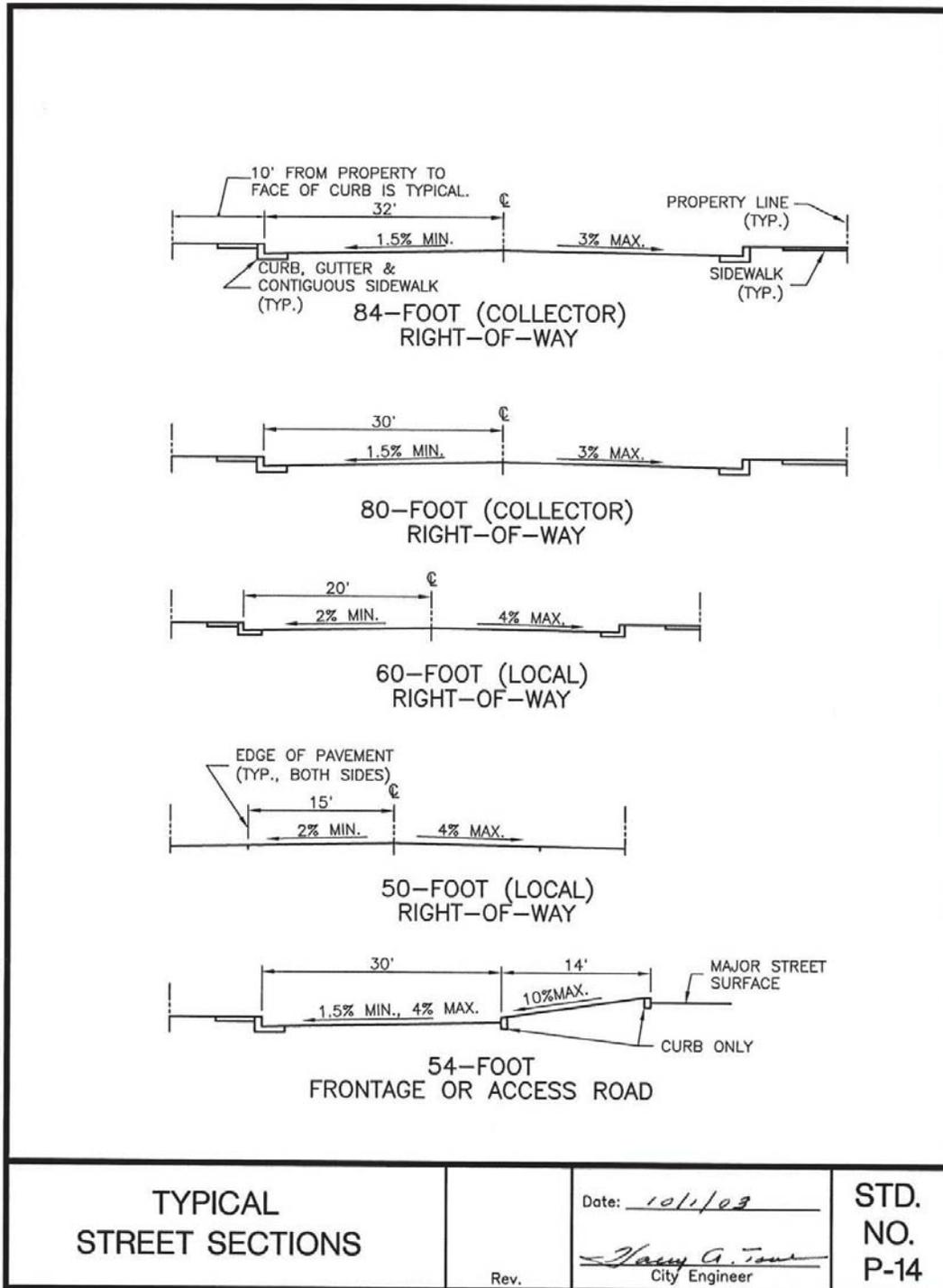


Figure 3-4. City of Lemoore Typical Street Requirements  
Source: Kings County Public Works Improvement Standards

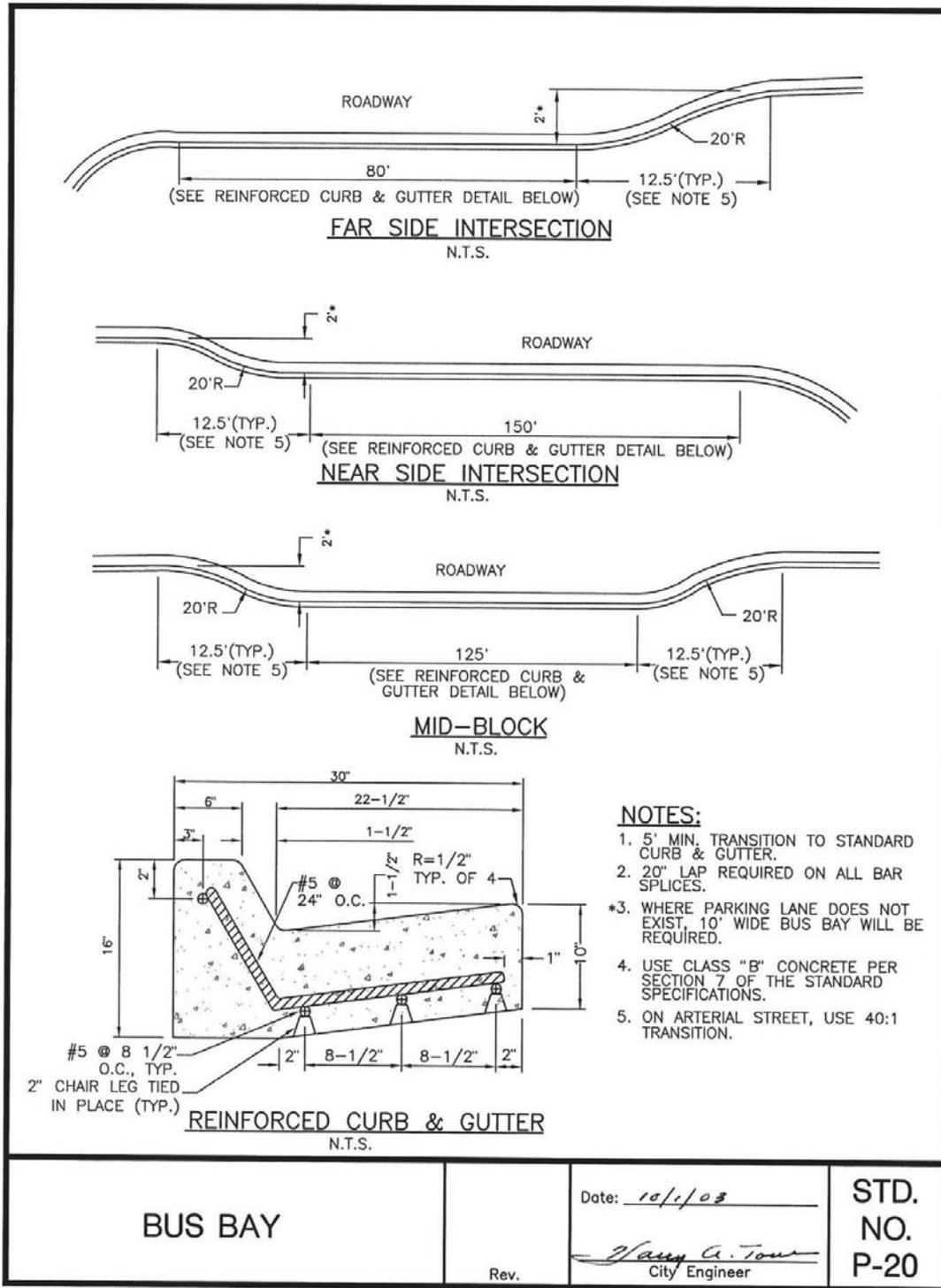


Figure 3-5. City of Lemoore Bus Bay Street Requirements  
 Source: Kings County Public Works Improvement Standards

## CURBS

Curbs with heights of 6 to 9 inches are ideal for transit stops and increase accessibility. Curbs with this height provide ease when boarding and allow for wheel chair ramps to operate correctly. Stops located next to low curbs pose difficulty for passengers when boarding and alighting. Similarly, raised curbs over 9 inches affect the operation of wheelchair lifts and should not be located at a bus stop.

Curb standards also vary from city to city within Kings County. For the incorporated areas of Hanford, Lemoore and Avenal, each city has their own set of standards, which are included in this document. For the unincorporated cities of Kettleman, Stratford and Armona, curbs should comply with the Kings County Public Works Improvement Standards document, Section 303 B for roadway improvements. Figure 3-6 provides a curb diagram that is in compliance with current Kings County standards:

Kings County Curb requirements:

- Curbs should have a height and width of 6-inches
- Curbs should have minimum slopes of:
  - 0.15% - straight sections
  - 0.25% - curb returns and cul-de-sac curves

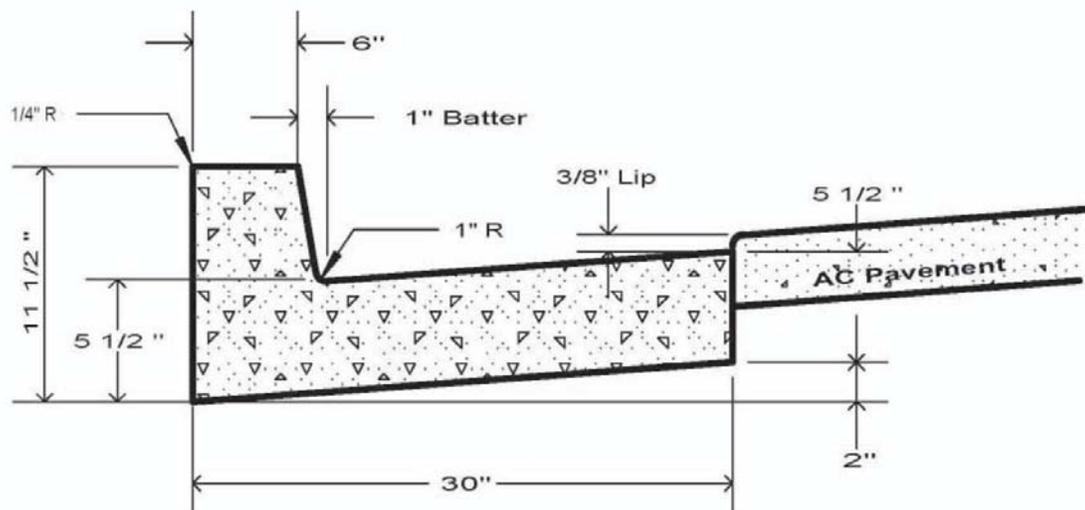


Figure 3-6. Kings County Curb Standards

Source: Kings County Improvement Standards

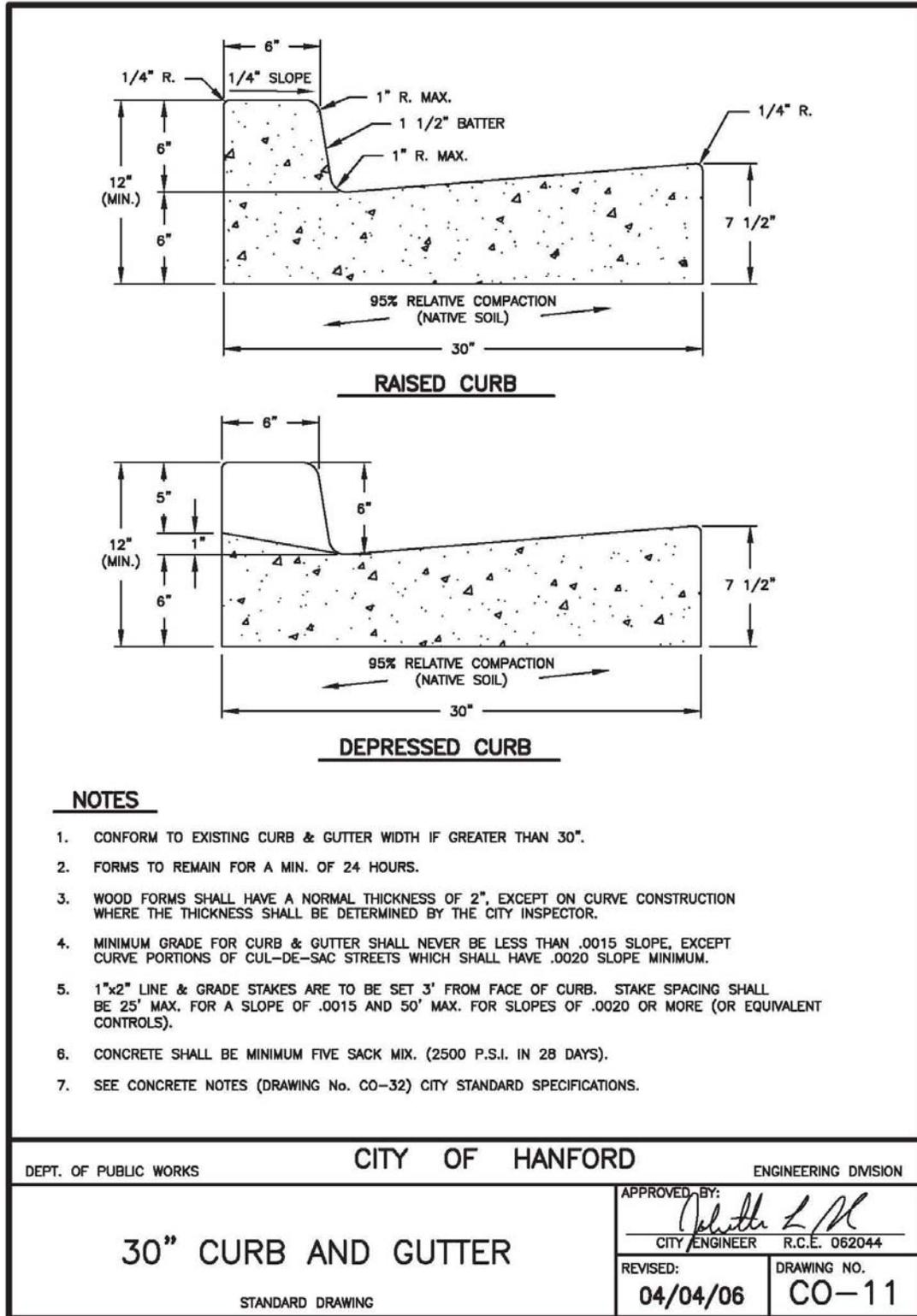


Figure 3-7. City of Hanford Curb Specifications  
 Source: Kings County Public Works Improvement Standards



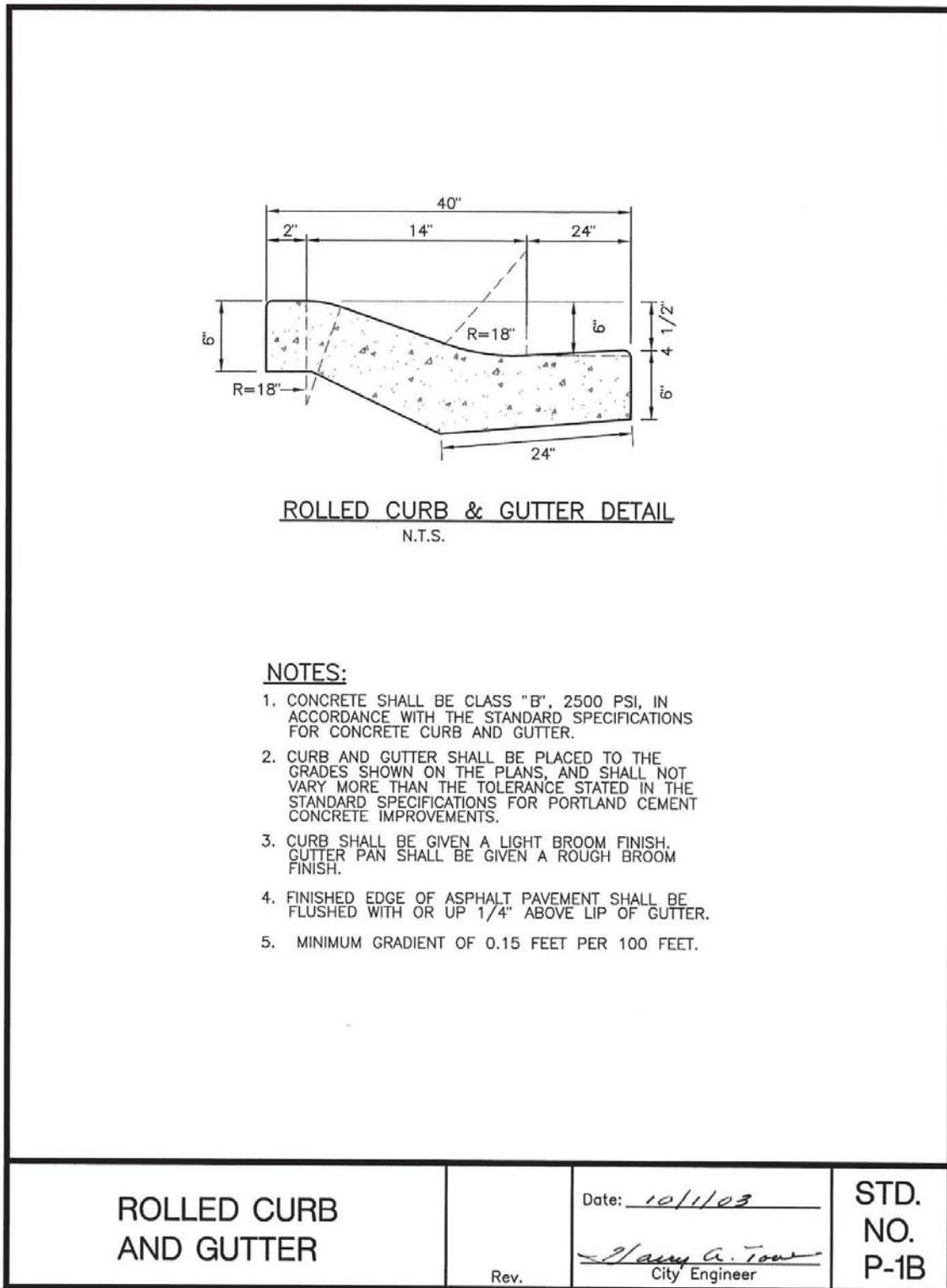


Figure 3-9. City of Lemoore Rolled Curb Specifications  
Source: Kings County Public Works Improvement Standards

## FLEET CHARACTERISTICS

KART provides service to the Kings County region through both its fixed route and paratransit services. KART operates a variety of transit vehicles that vary in terms of make, model, age, and fuel type. The fixed route fleet is comprised mainly of service vehicles that use natural gas and can hold up to 30 seated passengers. The paratransit vehicles used by KART comprise of passenger vans that can accommodate both passengers and wheelchairs, depending on the make and model of the vehicle. The transit system has a total of 250 bus stops with poles and signs, and schedule holders. There are 21 benches and 46 shelters installed along the routes, and KART is actively working to install additional passenger amenities throughout the system.

### KART FLEET

As of 2017, the Kings Area Rural Transit fleet consists of 36 operational vehicles. On average, buses are 35-feet long, though, sometimes longer, if providing bike racks. By type, the organization has 24 fixed route buses and 12 paratransit vehicles. During peak times, the organization has 15 fixed route buses in operation and 5 paratransit vehicles servicing patrons. Buses currently have working announcers and marquee boards to inform riders of route information and transit stops.



Kings Area Rural Transit Bus  
Photo Credit: So Cal Metro

# CURB-SIDE INFRASTRUCTURE DESIGN

## PEDESTRIAN CIRCULATION

All transit riders start and end their trips as pedestrians. Therefore, both the origin and destination must be accessible by providing for pedestrian circulation through the use of connections and pathways. A well-connected network of streets and pathways improves mobility by providing multiple travel routes and offering pedestrians a choice of how to reach a destination. Pedestrian circulation paths can include walkways, sidewalks, shared streets, shoulders, street crossings or crosswalks, overpasses or underpasses, courtyards, ramps, and landings within the public right-of-way. Pedestrian circulation paths can also be used to connect buildings within a development or adjacent land uses to a public right-of-way.

To ensure that pedestrian circulation is accessible, bus stop boarding and alighting areas shall be connected to streets, sidewalks, or pedestrian paths by an accessible route complying with Section 11B-402 (CBC 2016 11B-810.2.3). According to Section 11B-402, an accessible route must include walking surfaces with a running slope not steeper than 1:20 and curb ramps connecting pedestrians to and from their destinations.

## PRoWAG STANDARDS

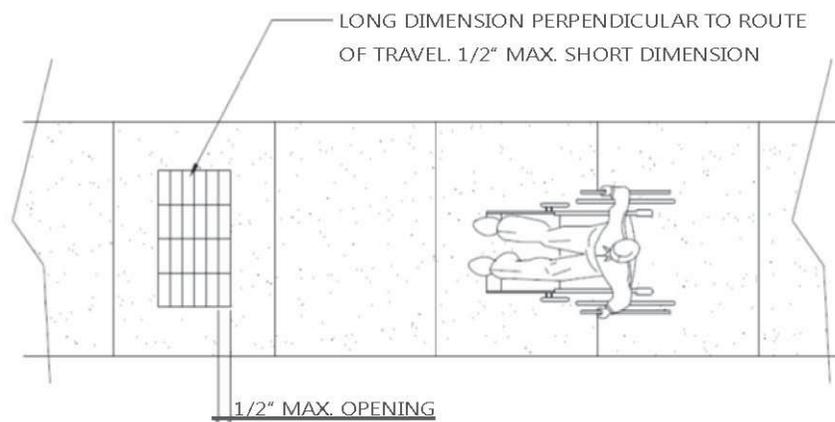
In accordance with Title II of the Americans with Disabilities Act (ADA) of 1990, all public entities must comply with Public Rights-of-Ways Accessibility (PRoWAG) standards and guidelines. The PRoWAG guidelines outlined in this manual have been included to serve as a reference for future transit development projects.

The following components of pedestrian access routes are required to be in compliance with PRoWAG standards:

- Sidewalks
- Street crossings
- Overpasses and underpasses
- Ramps, curb ramps, and blended transitions
- Elevators and lifts
- Doors, doorways, and gates

## SIDEWALK

Sidewalks should be provided along pedestrian access routes to ensure that pedestrians have a continuous and unobstructed path of travel. Sidewalk slopes should be as minimal as possible and should not exceed the slope of the street. The slope of the sidewalk should not exceed 5.0% and the cross slope of the sidewalk should not exceed 2.0%. If gratings are present along sidewalks, they should not exceed gaps larger than 1/2".



NOTE: GRATING SHOULD NOT BE LOCATED  
IN THE PATH OF TRAVEL WHENEVER POSSIBLE

Figure 3-1. Grating within the Public Right-of-Way

Source: Sally Swanson Architects, Inc.

The recommended PROWAG standards for sidewalks include:

- The continuous clear width of pedestrian access routes shall be 4.0 feet minimum, exclusive of the width of the curb.
- Where the clear width of pedestrian access routes is less than 5.0 feet, passing spaces shall be provided at intervals of 200.0 feet maximum. Passing spaces shall be 5.0 feet minimum by 5.0 feet minimum. Passing spaces are permitted to overlap pedestrian access routes.
- Where pedestrian access routes are contained within a street or highway right-of-way, the grade of pedestrian access routes shall not exceed the general grade established for the adjacent street or highway. Where pedestrian access routes are not contained within a street or highway right-of-way, the grade of pedestrian access routes shall be 5 percent maximum.
- The cross slope of pedestrian access routes shall be 2 percent maximum.
- The surfaces of pedestrian access routes and elements and spaces required to comply with R302.7, which dictate pedestrian access routes shall be firm, stable, and slip resistant.

## STREET CROSSINGS

To maintain safe travel for all riders using KART, it is recommended that bus stops are placed at controlled intersections to encourage safe crossing. When possible, bus stops should not be placed at uncontrolled intersections, as this may encourage pedestrians to engage in unsafe mid-block travel.

At controlled intersections, crosswalks should be provided to protect pedestrians from conflicts with vehicular traffic. Boundaries of safe crossing zones should use both contrasting color striping and truncated domes as detectable warnings for pedestrians entering the crosswalk. Where possible, changes in surface materials should be used to more clearly differentiate the crosswalk from the street. For example, stone pavers as a crosswalk on asphalt provide both a visual and

tactile indication of crosswalk for all users.

To ensure that street crossings are both safe and in compliance with PRowAG, the following technical requirements should be implemented:

- Crosswalks should be 6.0' wide at minimum
- Cross slopes shall not exceed 2.0%
- Crosswalks contained within pedestrian street crossings, shall not exceed 5.0% maximum run slope
- Crosswalks contained within mid-block street crossings, shall not exceed the street or highway grade

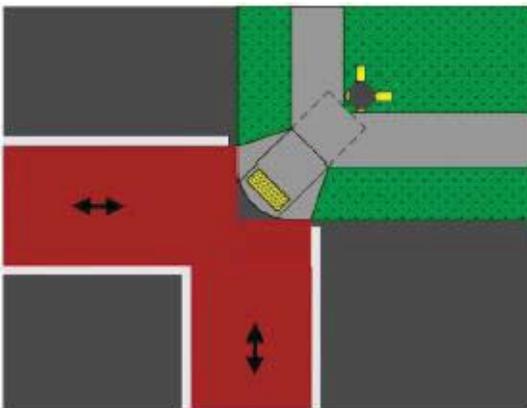


Figure 4-2. Crosswalk slope  
Source: PRowAG

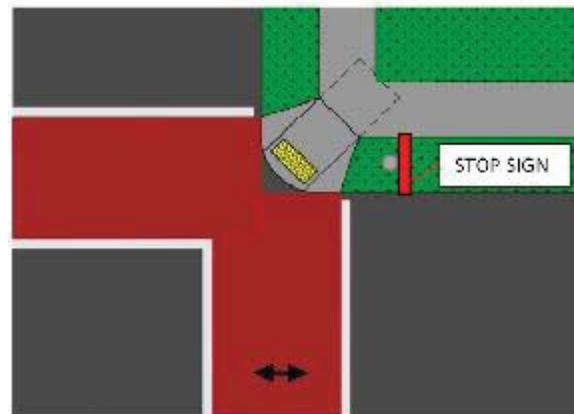


Figure 4-3. Stop or yield controlled approach  
Source: PRowAG

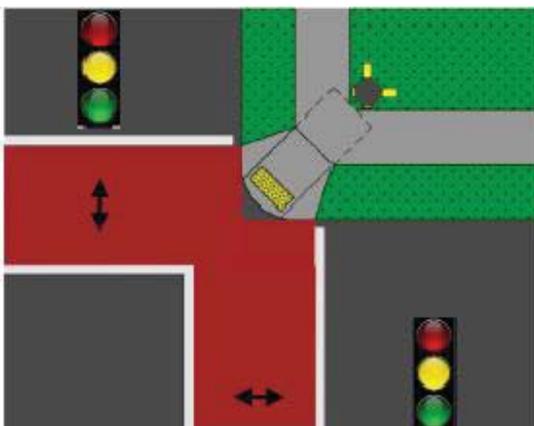


Figure 4-4. Crosswalk cross slope  
Source: PRowAG

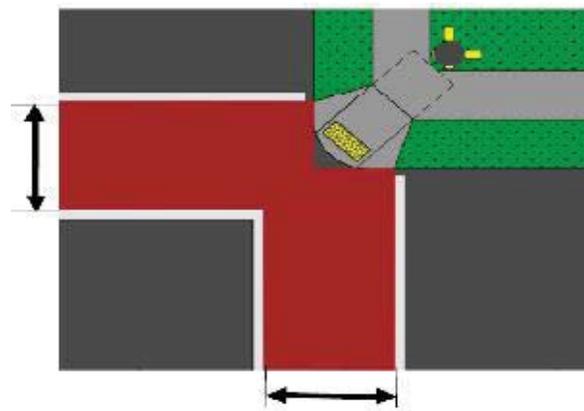


Figure 4-5. Crosswalk width  
Source: PRowAG

## PEDESTRIAN SIGNALS

To facilitate safe street crossing, it is important that crosswalks are equipped with wide curb ramps adjacent to crosswalks and pedestrian signals. Pedestrian signals with “Walk”/“Don’t Walk” displays should include both audible and visual communications. In addition, pedestrian crossing cycles should be long enough for slow moving pedestrians to cross safely.



Figure 4-8. Accessible pedestrian signal  
Source: Manual on Uniform Traffic Control Devices



Figure 4-9. MUTCD Signage  
Source: Manual on Uniform Traffic Control Devices

Though many traffic signals within Kings County are currently being retrofitted with crossing countdowns, as of now, few buttons are tactile, audible, and visual. Though only new intersections must comply with the California Building Code of 2016, signals that do not comply pose critical issues for persons with disabilities. People with visual impairments are especially disadvantaged without tactile and audible buttons because consistency within the physical environment (i.e. transit facilities) is so important to them. As the number of persons with disabilities within Kings County continues to grow, it will become more important to provide signals with the following criteria:

- Audible locator tones with ambient noise sensors to increase volume when intersections become noisier. Locator tones should be present at both starting curb and ending curb to confirm users are going in the correct direction from start to finish.
- Vibrational sensors to notify those with hearing and visual impairments of safe crossing.
- Speech crossing information should be provided when button is held down (e.g. location, direction crossing, etc.).
- Where red light intersections are not present, other lights should flash to indicate to approaching cars that pedestrians are crossing.
- Located adjacent to unobstructed, level surfaces with sufficient turning space for wheelchair access.
- Placed adjacent to an accessible route which includes connections to sidewalks, curb ramps, and crossings served.
- The face of the push button shall be placed parallel to the crosswalk it serves in the expected pedestrian direction of travel.
- Pushbuttons shall be visually contrasting with its housing (dark-on-light or opposite).
- Pushbuttons shall be a minimum of 2.0” diameter.

- All pedestrian signal timing should be calculated using a pedestrian walk speed of 3.5 feet per second or less

**CURB RAMPS**

Curb ramps provide access between sidewalks, streets, and transit stops for a wide variety of users, including passengers with wheelchairs, luggage, or strollers. Curb ramp design must comply with both the ADA and the PROWAG standards. The three most common types of curb ramps include parallel curb ramps, perpendicular curb ramps, and blended transitions.

To ensure these compliance needs are met, the following technical requirements must be met for parallel and perpendicular curb ramps:

- Maximum running slope of 8.33%
- Maximum cross slope of 2.0%
- Maximum flared sides of 10.0% (perpendicular only)
- Minimum ramp width of 48.0"
- Minimum clear bottom landing space of 48.0" by 48.0" (parallel only). A minimum clear bottom landing space of 48.0" by 60.0" is recommended.
- Minimum clear top landing space of 48.0" by 48.0"
- Maximum landing slopes of 2.0% by 2.0% (top and bottom landings)

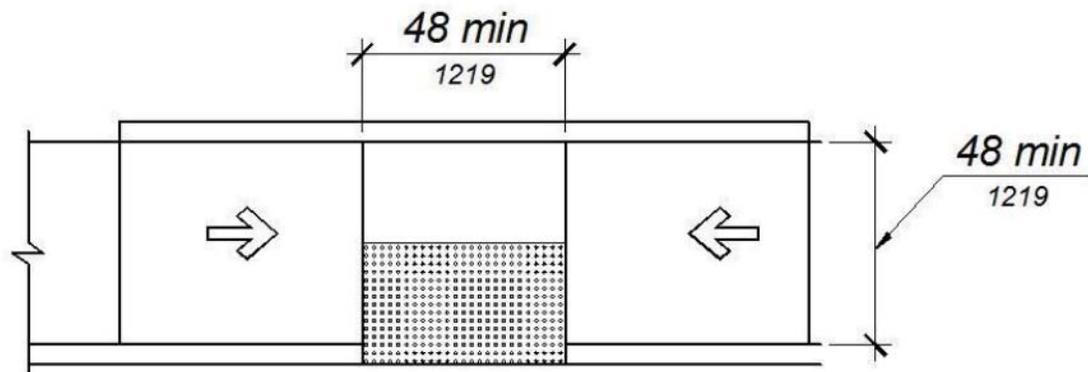


Figure 4-10. Parallel curb ramp  
Source: California Building Code 2016

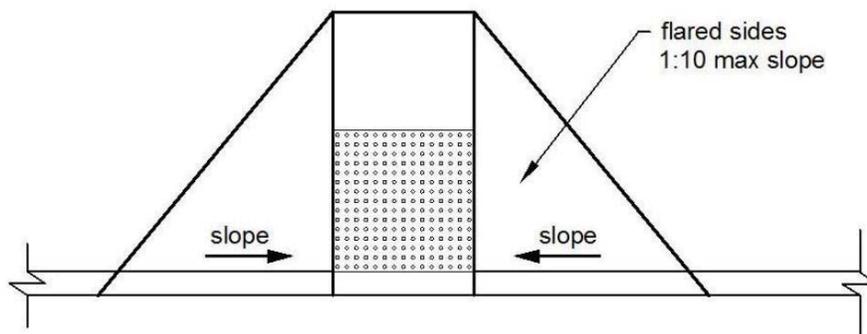


Figure 4-11. Perpendicular curb ramp  
 Source: California Building Code 2016

To ensure these compliance needs are met, the following technical requirements must be met for blended transitions:

- Maximum running slope of 5.0%
- Maximum cross slope of 2.0% with a flush transition at street level
- Maximum counter slope of 5.0%
- Minimum width of 48.0"
- 48.0" square level landing at the top of the slope

All curb ramps and blended transitions should be equipped with detectable warning surfaces at the bottom of each ramp. These detectable warning surfaces help to indicate traffic crossings to users with visual impairments. To comply with CBC, ADA and PROWAG, the following criteria must be met:

- Color shall be yellow
- Detectable warnings should be 36.0" at minimum and extend the entire length of the ramp
- Truncated dome base diameter of 0.9" to 0.92"
- Truncated dome top diameter of 0.45" to 0.47"
- Truncated dome height of 0.18" to 0.22"
- Truncated domes shall be spaced at 2.3" to 2.4" apart, on center
- Truncated dome base-to-base spacing shall be at a minimum of 0.65" apart

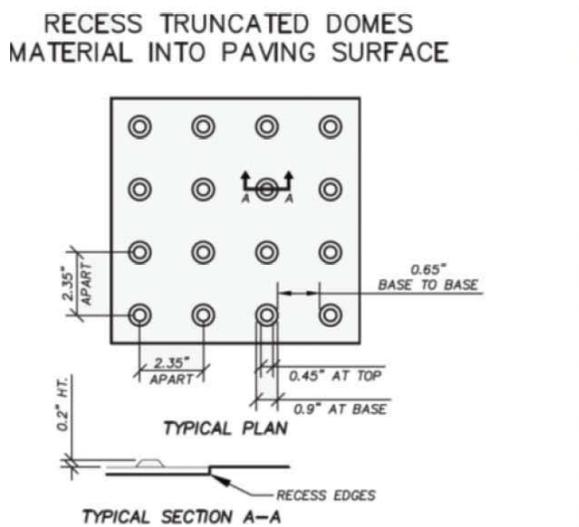


Figure 4-12. Typical plan for truncated domes  
 Source: PROWAG

Truncated domes as a detectable warning at street crossing.  
 Photo credit: SSA

## TRANSIT FACILITIES

KCAPTA offers riders two types of transit facilities while utilizing KART's transit service. Off-street facilities, such as transit centers, provide a centralized hub for its fixed route service and provide connections to other methods of transportation like commuter rail and buses that travel outside the Kings County region. Transit centers have the benefit of bringing all bus routes together for easy transferring and connectivity. The size of the facility can vary, yet the facility must fulfill the basic functions of serving all routes with adequate boarding areas and providing a comfortable and convenient waiting area for passengers. Shelter, seating, route information, public telephones, bicycle racks and bicycle lockers should be provided. These types of transit facilities serve a wide variety of riders and help increase transit connectivity to other regions of California.

On-street facilities, such as bus stops, are locations near or along public roads where riders can access the fixed route service. In terms of accessibility, the most substantial improvements can be made from upgrading or renovating KART's on-street transit facilities.



Hanford Transit Center  
Photo credit: KART

## OFF-STREET FACILITIES

Off-street transit facilities tend to be placed in centralized locations and are located next to multimodal types of transportation. These types of facilities provide shelter from inclement weather and offer various rider amenities such as vending machines, benches, trash receptacles and bicycle parking. These locations offer optimal accessibility to a wide variety of riders and should have ADA compliant curbs, ramps and structures. Off-street transit facilities reduce travel times and substantially increase connectivity to other modes of transportation. In the case of Kings County, the largest off-street facility is in central Hanford and provides connectivity to the commuter rail system of Amtrak that connects Kings County to its surrounding regions. This facility also provides service and access to all 18 of the fixed route bus services that KART provides.

To ensure that KART's off-street facilities comply with the 2010 ADA standards, PRowAG, and the California Building Code, the following requirements must be met:

- Stations shall not be designed or constructed so as to require persons with disabilities to board or alight from a vehicle at a location other than one used by the general public.
- Bus stop boarding and alighting areas shall have a firm, stable surface.
- Bus stop boarding and alighting areas shall provide a clear length of 96 inches minimum, measured perpendicular to the curb or vehicle roadway edge, and a clear width of 60 inches minimum, measured parallel to the vehicle roadway.
- Bus stop boarding and alighting areas shall be connected to streets, sidewalks, or pedestrian paths by an accessible route complying with 402.
- Parallel to the roadway, the slope of the bus stop boarding and alighting area shall be the same as the roadway, to the maximum extent practicable. Perpendicular to the roadway, the slope of the bus stop boarding and alighting area shall not be steeper than 1:48.
- Shelters shall provide a minimum clear floor or ground space complying with 305 entirely within the shelter.
- Bus shelters shall be connected by an accessible route complying with 402 to a boarding and alighting area complying with 810.2.
- Bus route identification signs shall comply with 703.5.1 through 703.5.4, and 703.5.7 and 703.5.8. In addition, to the maximum extent practicable, bus route identification signs shall comply with 703.5.5.

**EXCEPTION:** Bus schedules, timetables and maps that are posted at the bus stop or bus bay shall not be required to comply.

## ON-STREET FACILITIES

For a transit agency that encompasses a large part of unincorporated and rural areas, on-street facilities are the front lines of accessibility for KART. Riders usually encounter on-street facilities at the start or end of their trip and their views and experiences with these facilities can impact ridership. Because rural environments pose developmental issues for bus stops and on-site facilities, transit stops in these areas are crucial to provide vital transportation resources to residents. Kings County has a unique transit environment where it provides service to residential, urban, and rural areas. And just as KART's transportation service is consistent in each of those environments, its facilities should remain consistent throughout.

Riders with disabilities can face many unique challenges using a transit system due to their disability. Absence of proper access paths, sidewalks, and ramps to their bus stops can serve as a barrier to riding the fixed route transportation services offered by KART.

Some important features that will increase accessibility:

- Defined and clearly marked sidewalk access with the most direct route to and from the bus stops
- If an access point is located near a walled community, an access gate to the bus stop should be provided to meet the needs of riders for whom distance is an obstacle
- Located on solid, slip resistant, firm, stable surfaces
- Landing pad that has a clear and open space of 5.0' x 8.0' (ADA requirement)
- An area where riders can wait for buses off the roadway



KART bus stop. Photo credit: KART

In Kings County, there are a variety of different bus stops that mark service points and provide passengers with system information. While some of KART's bus stops provide adequate accessibility for riders, many pose barriers to access due to various factors described in this section. To identify the inaccessible transit stops and their ADA violations, a categorical system was used to standardize bus stops with accessibility issues.

Bus stops that were not included in the following categories by initial inspection, are considered ADA compliant. In general, the KART system utilizes five types of on-street facilities that do not currently meet ADA compliance for a public transportation agency.

**These types of bus stops include:**

- Bus stops at narrow sidewalk
- Bus stops at planter area
- Bus stops at non-restrictive asphalt shoulder
- Bus stops at restricted asphalt shoulder
- Bus stops at inaccessible slopes or surfaces

Each of these categories present a significant obstacle for riders with disabilities utilizing KART's system.



Non-accessible bus stop along KART's Avenal-Hanford Route 12.

Photo credit: Google Earth

## BUS STOPS ON NARROW SIDEWALKS

- Sidewalk is used as a bus stop.
- Sidewalk is directly adjacent to the curb line.
- No landing pad for wheelchair access is provided.

Bus stops in this category are placed directly on the sidewalk and are predominately placed within residential areas in Kings County. For these transit stops, the sidewalk is not wide enough to accommodate a bus landing pad for boarding and alighting (ADA requirement). Without a clear landing pad area, these types of transit stops are not ADA compliant. To make these transit stops ADA compliant, a landing pad needs to be installed that is at least 60 inches wide and 96 inches long. It is recommended to provide a bus shelter area that protects riders from inclement weather and provides seating for bus stops that receive a significant number of riders.



Bus stop with no landing pad area

Photo Credit: Google Earth

## BUS STOPS IN PLANTER AREAS

- Planter area is used as a bus stop.
- Planter area is located between the curb line and sidewalk.
- Planter area does not provide a firm, stable and slip-resistant surface.
- No landing pad for wheelchair access is provided.

Transit stops located in planter areas are not connected to an accessible path and pose a significant barrier to access for some riders. Riders with mobility issues are required to cross planter areas that are not slip resistant, and during inclement weather can become impassable. To make these bus stops ADA compliant, a landing pad of at least 60 inches wide and 96 inches long needs to be provided. Providing a landing pad of a concrete material will also satisfy the nonslip ADA requirement for on street transit stops. In addition to providing a landing pad to these bus stops, for locations that service a significant number of riders, it is recommended that a bus shelter be provided.



Bus stop location not accessible by sidewalk  
Photo Credit: Google Earth

## BUS STOPS ON NONRESTRICTED ASPHALT SHOULDER

- Asphalt shoulder is used as a bus stop.
- Asphalt shoulder has no landing pad for wheelchair access.
- Asphalt shoulder area is not firm, stable, and slip resistant.
- Asphalt shoulder has excessive slope and uneven surfaces.

Some of KART's bus stops are located along asphalt shoulders and provide significant obstacles for riders with mobility issues. These bus stops do not provide landing pads for wheelchair accessibility or a firm, stable and slip resistant surface for riders. These stops are found outside of city centers and do not provide curbs, sidewalks or pedestrian amenities. As development in these areas grows, initial improvements to these bus stops may include continuous sidewalks leading to landing pads that are at least 5 feet wide by 8 feet long.

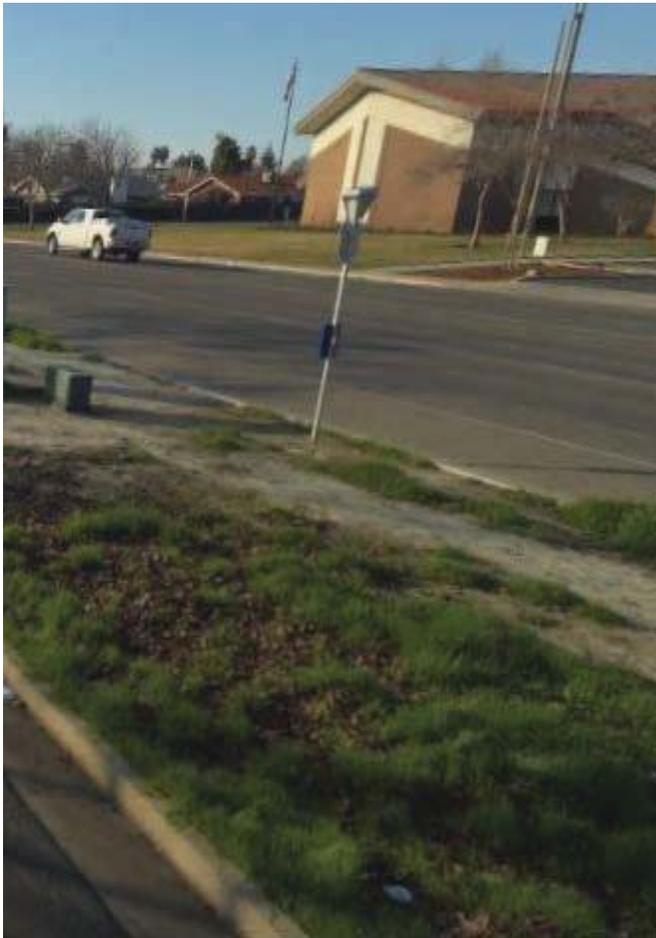


Bus stop location not serviced by sidewalk  
Photo Credit: Google Earth

## BUS STOPS NOT CONNECTED TO ACCESSIBLE ROUTE

- Transit stop is not connected to sidewalk or any other accessible path of travel.
- There is no accessible connection between sidewalks, streets, and/or parking areas and bus stops.

These types of bus stops are found not connected to any accessible routes and in some cases found in an island that is not paved and offers no guidance or accessibility to the transit stop. It is recommended that these types of bus stops be relocated to areas that offer better accessibility.



Bus stop located on island where riders must cross roadway to access  
Photo Credit: Google Earth

# DIMENSIONAL GRAPHIC STANDARDS

## BUS STOPS

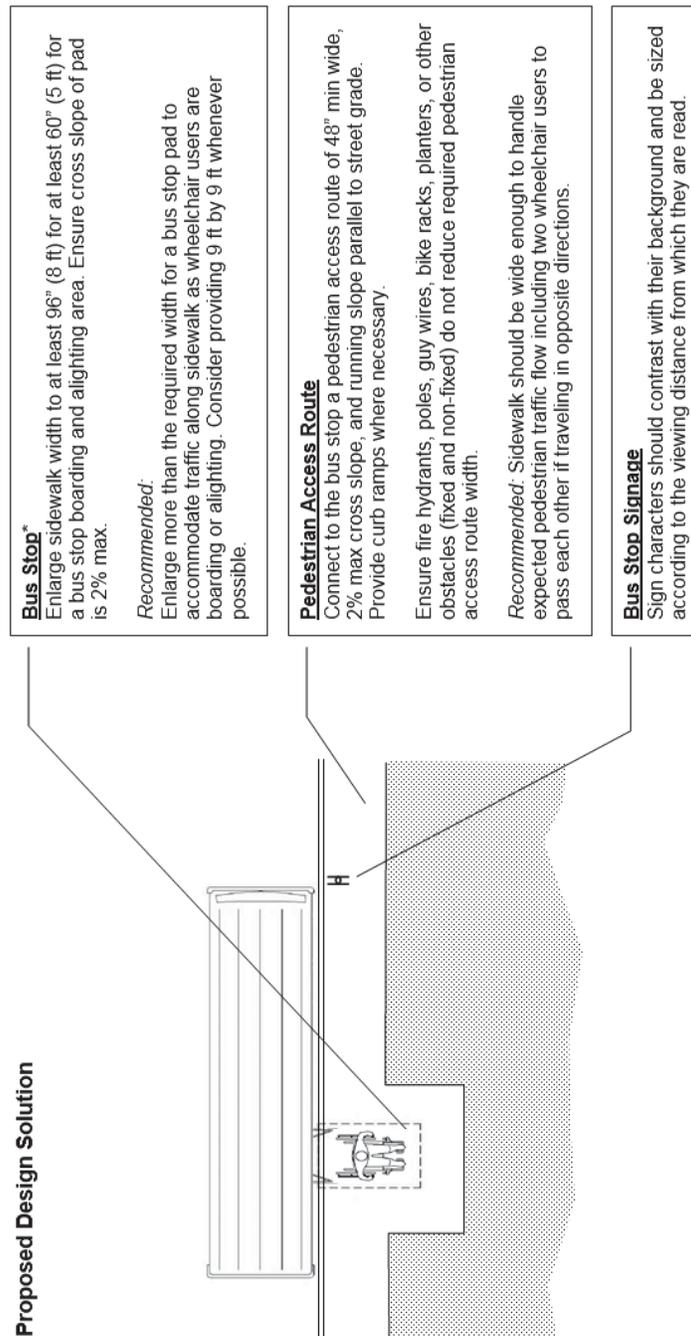


Figure 5-1. Bus stops at narrow sidewalks

**Proposed Design Solution**

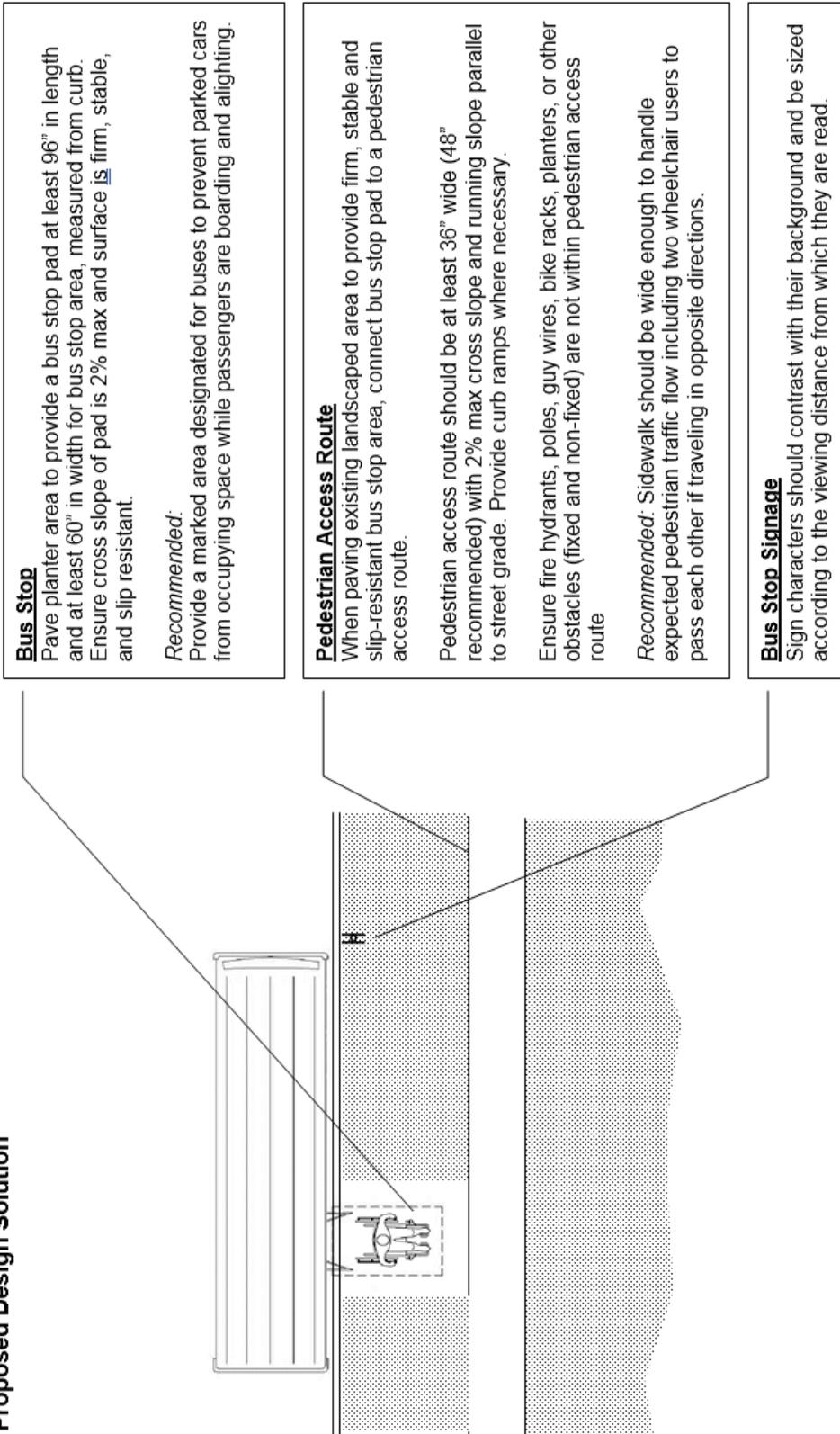


Figure 5-2. Bus stops at planter areas

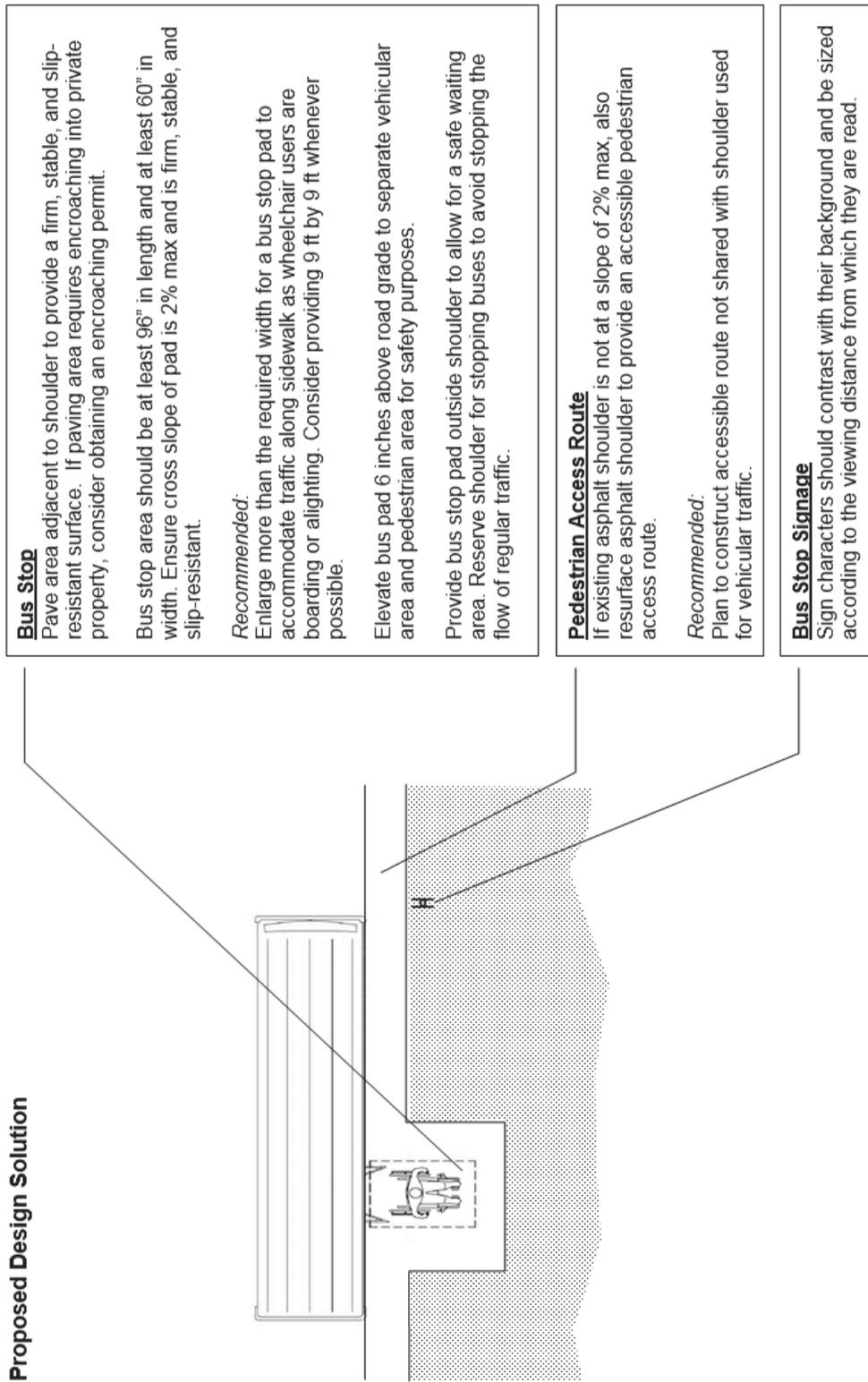


Figure 5-3. Bus stops at asphalt shoulder

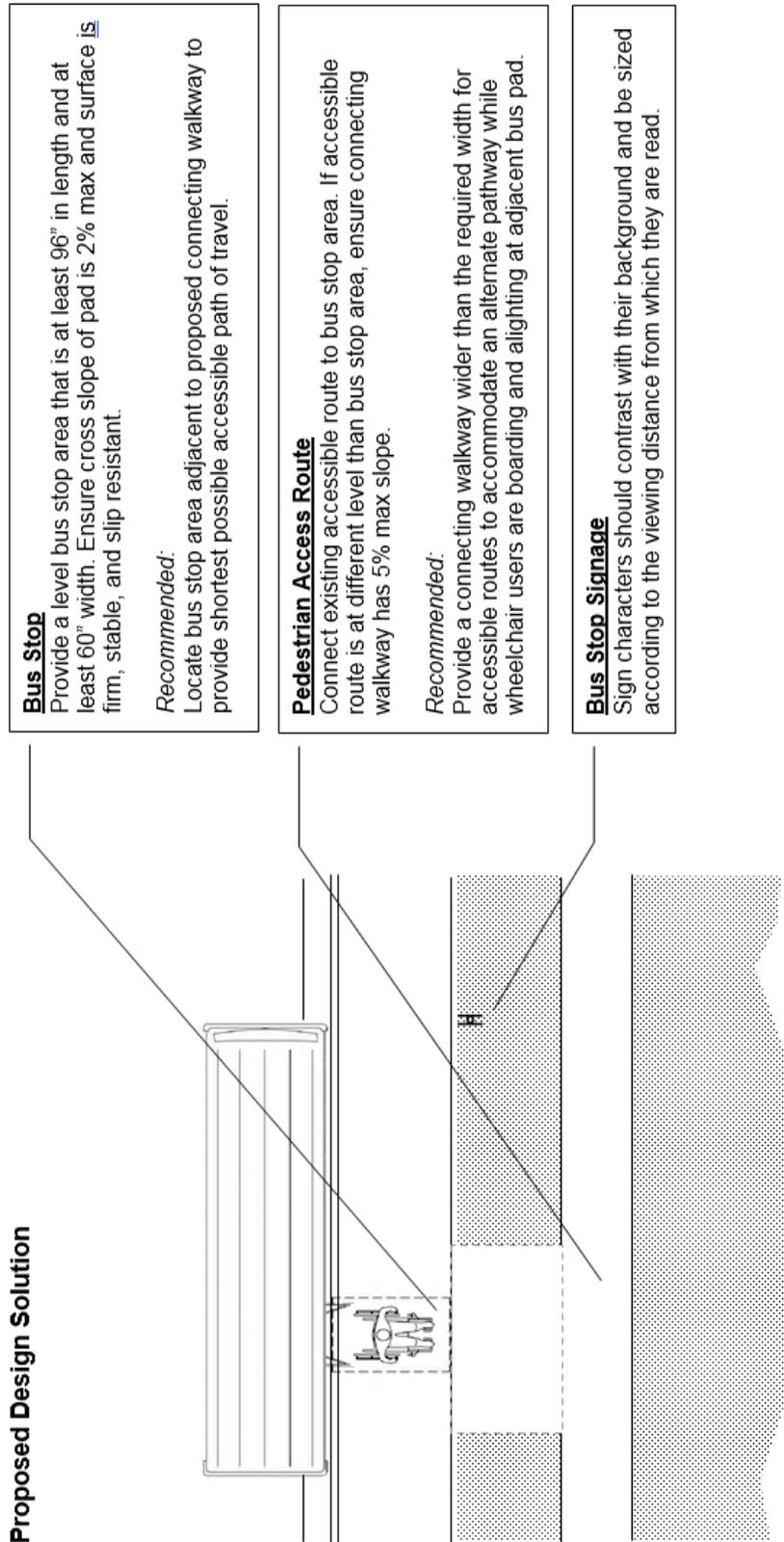


Figure 5-4. Bus stops not connected to accessible route

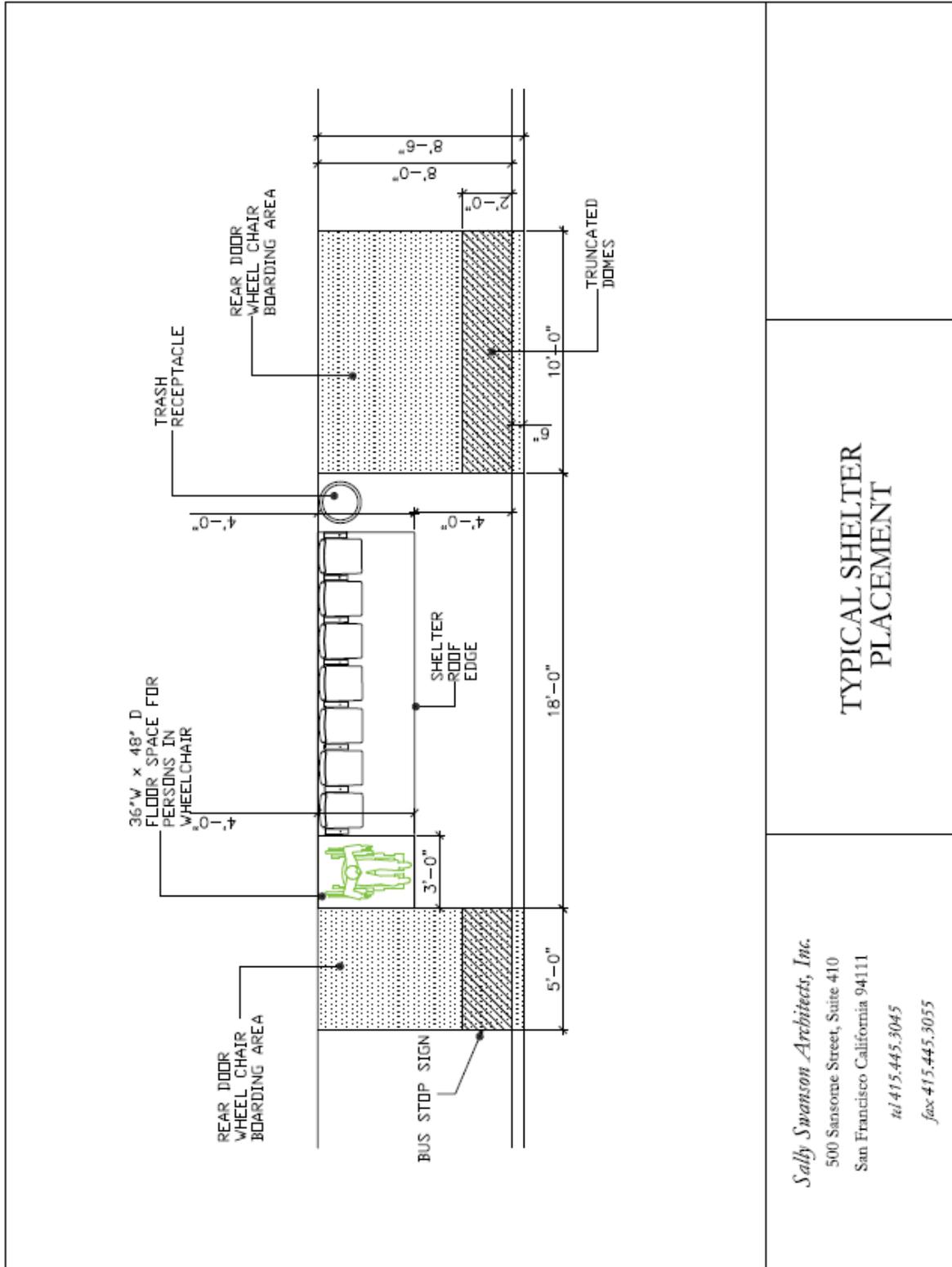
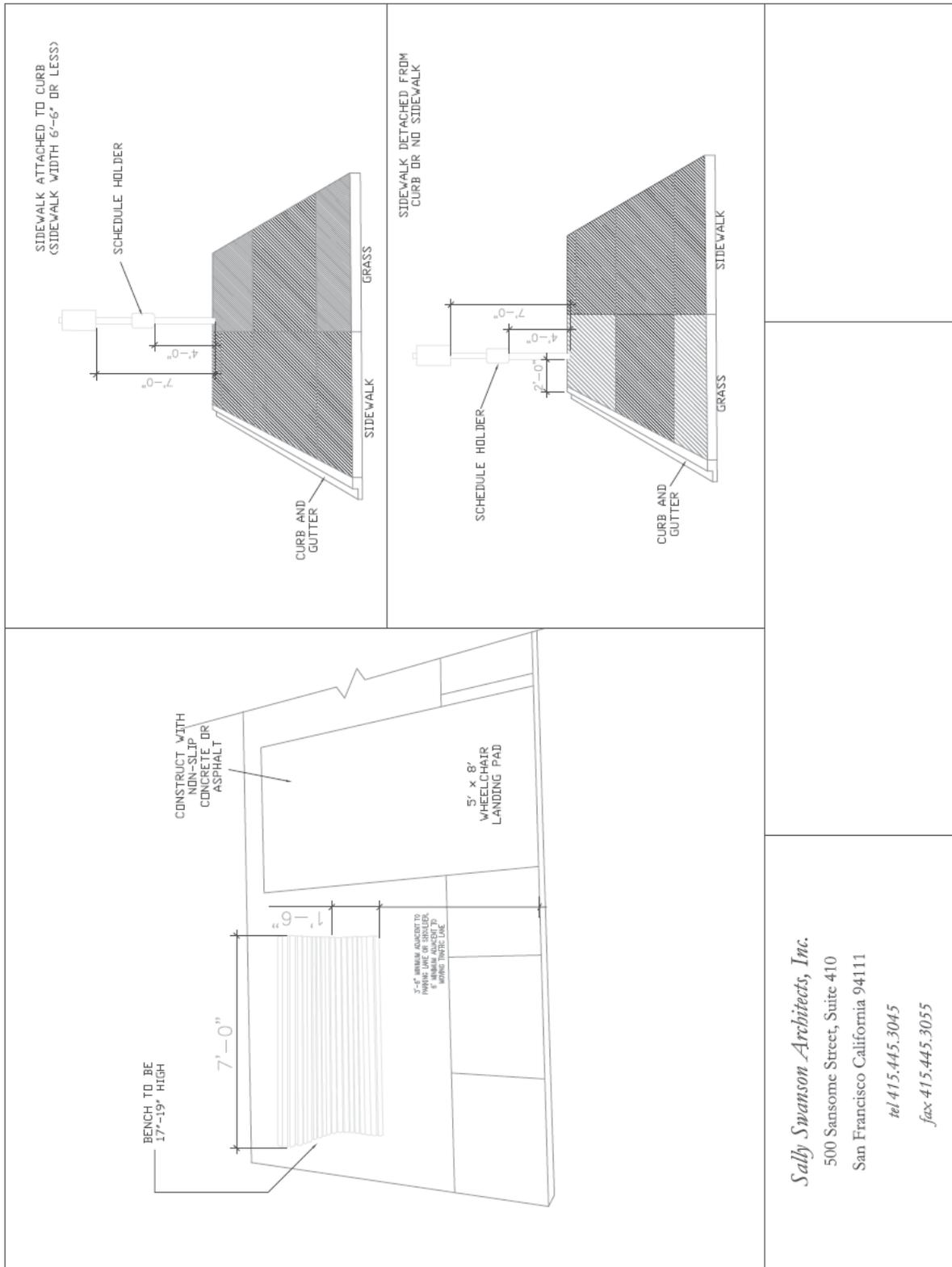


Figure 5-5. Typical shelter placement at a bus stop

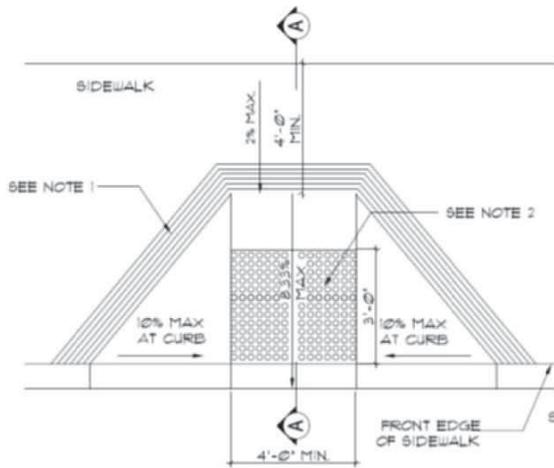


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 500 Sansome Street, Suite 410  
 San Francisco California 94111  
 tel 415.445.3045  
 fax 415.445.3055

Figure 5-6. Typical bus stop without a shelter

# CURB RAMPS

## Perpendicular Curb Ramp



NOTE:

1. THE CURB RAMP SHALL BE OUTLINED, AS SHOWN, WITH A 1'-0" WIDE BORDER WITH ¼" GROOVES APPROXIMATELY ¾" ON CENTER (ACCORDING TO CBC 2013 ONLY. ALTHOUGH THIS IS NO LONGER ENFORCEABLE, CONTINUING USE IS STILL RECOMMENDED TO MEET BEST PRACTICES)
2. CURB RAMP SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH AND 3'-0" DEPTH (DIRECTION OF TRAVEL) OF THE RAMP. THE EDGE OF THE DETECTABLE WARNING SURFACE NEAREST THE STREET SHALL BE BETWEEN 6" AND 8" FROM THE GUTTER FLOWLINE
3. MAXIMUM SLOPE OF ADJOINING GUTTERS, THE ROUND SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5% WITHIN 4'-0" OF THE TOP AND BOTTOM OF THE CURB RAMP.

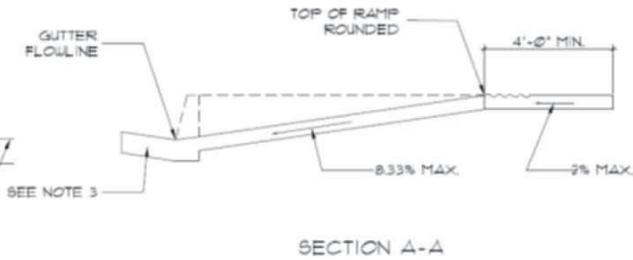


Figure 5-7. Plan view of a typical concrete perpendicular curb ramp by SSA.

## Parallel Curb Ramp

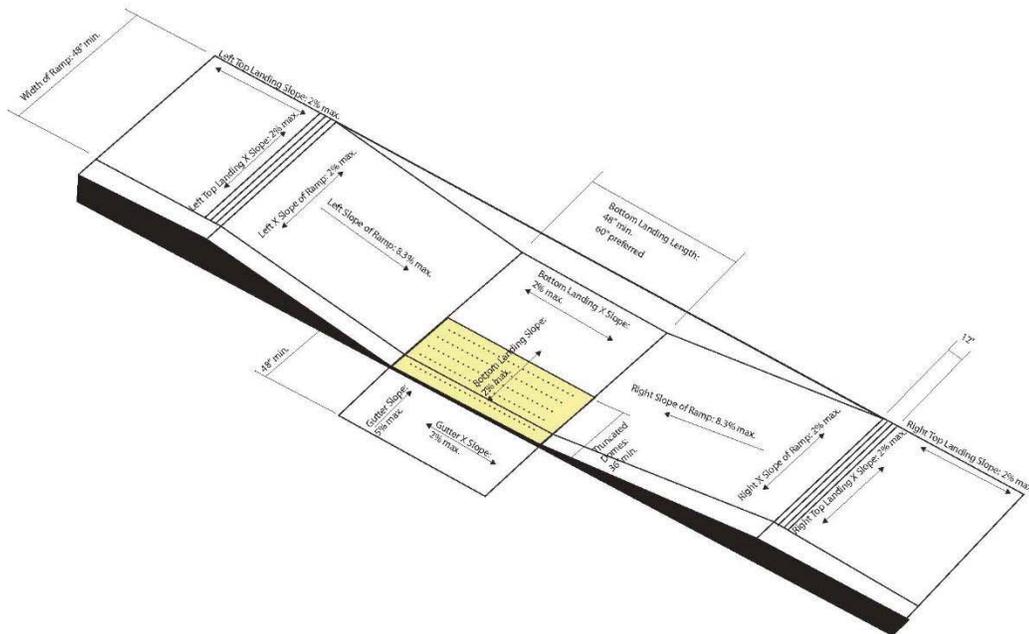


Figure 5-8. Compliant parallel curb ramp by SSA.

## DETECTABLE WARNING SURFACE

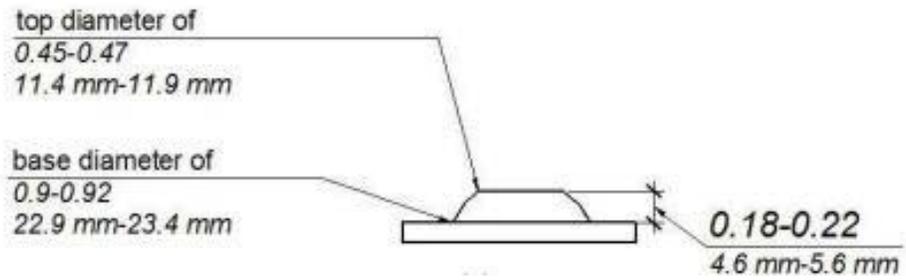


Figure 5-9. Grooved detail for a detectable warning surface.  
Source: California Building Code 2016

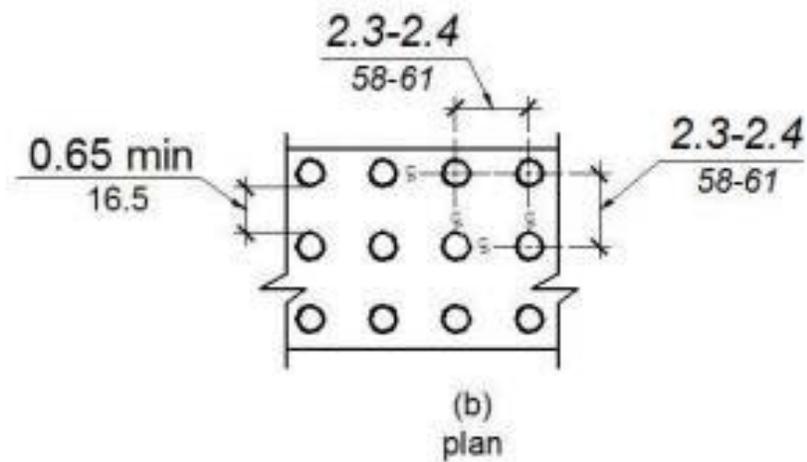


Figure 5-10. Truncated domes detail.  
Source: California Building Code 2016

# SIGNAGE

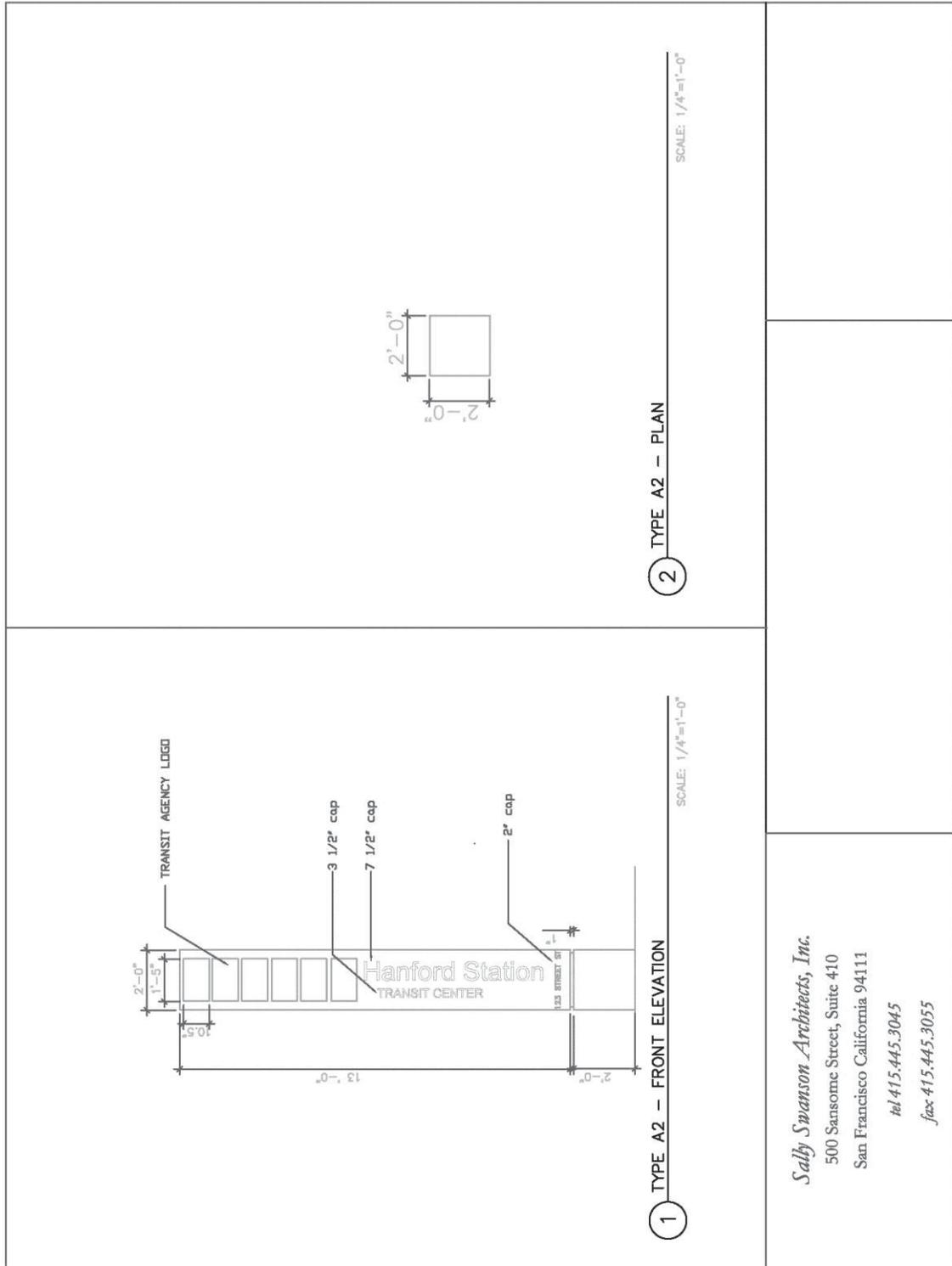


Figure 5-13. Typical artwork for large vertical signage

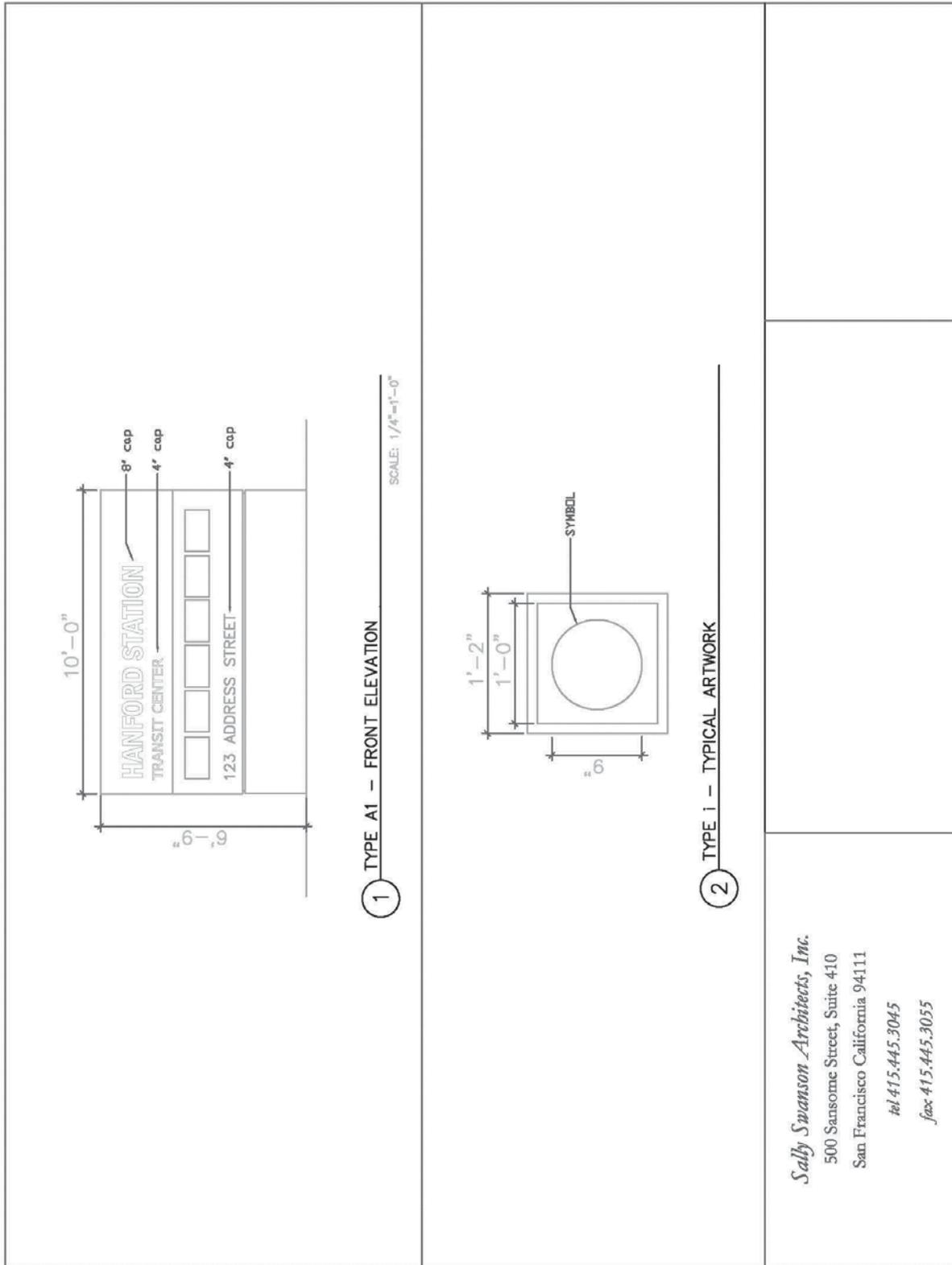
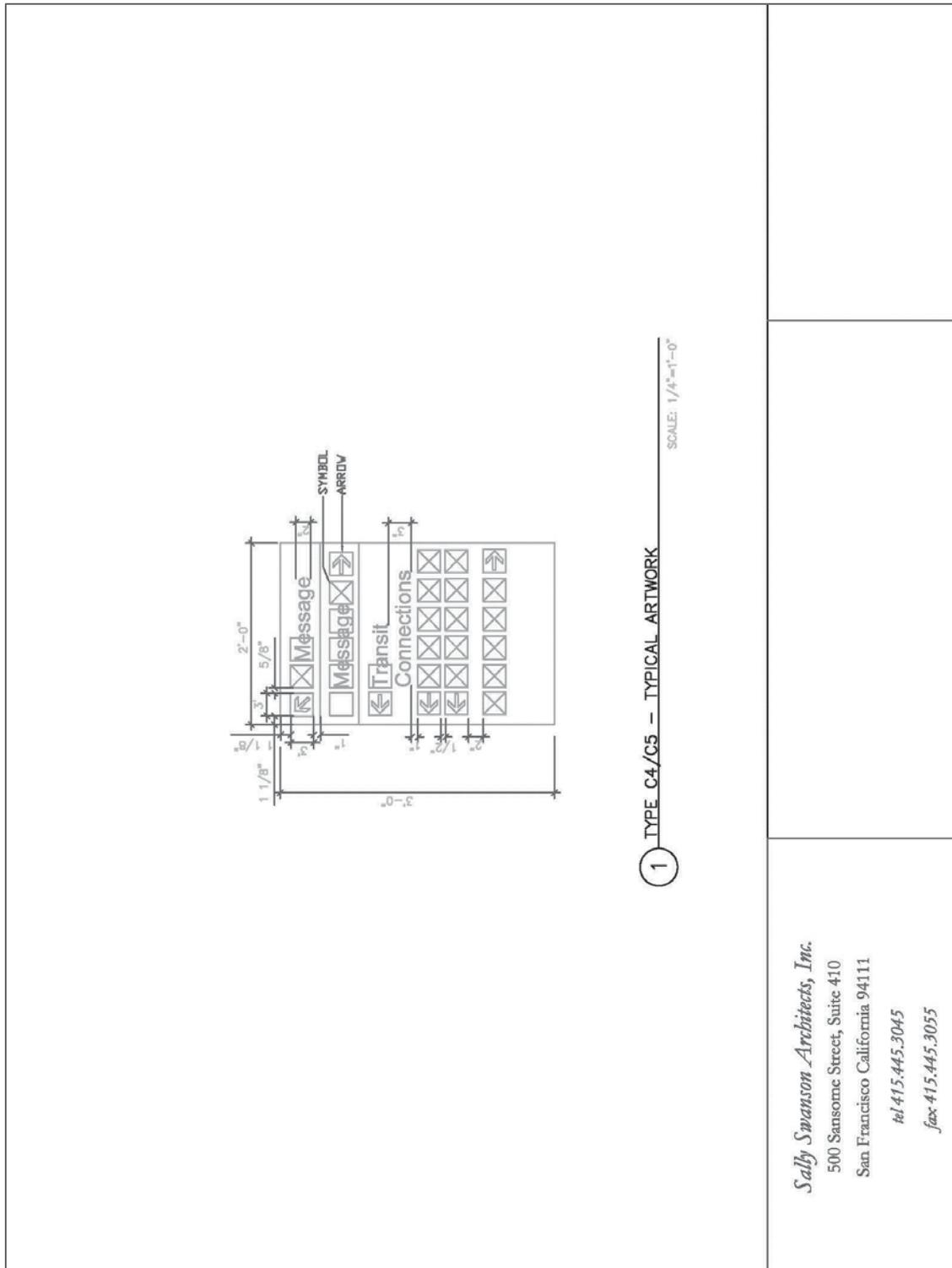


Figure 5-14. Typical artwork for transit identification (1) and informational signage (2).



*Sally Swanson Architects, Inc.*  
 500 Sansome Street, Suite 410  
 San Francisco California 94111  
 tel 415.445.3045  
 fax 415.445.3055

Figure 5-15. Typical artwork for transit connections

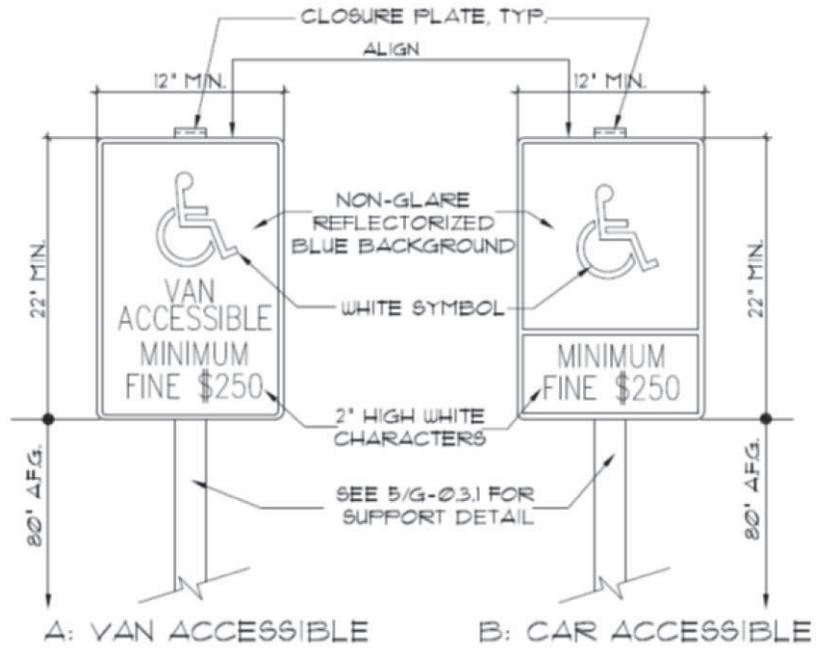


Figure 5-16. Parking signage adjacent to path of travel

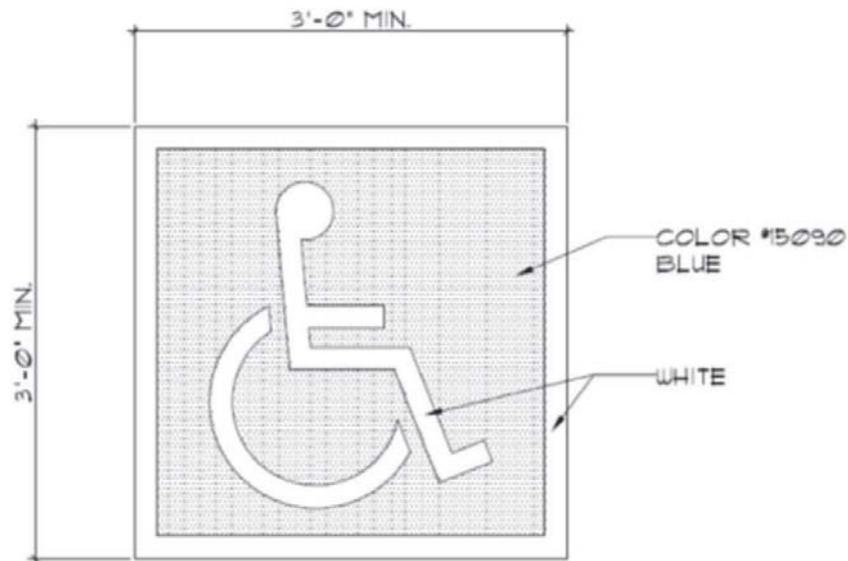


Figure 5-17. Accessible parking stall pavement symbol by SSA.

# CUT SHEETS AND SPECIFICATIONS

This section outlines options for vendors and ADA compliant products for transit amenities with cut sheets and specifications. Transit amenity products have been selected from the following local vendors:

- All Purpose Manufacturing, Inc.
- Tolar Manufacturing, Inc.
- LNI Custom Manufacturing, Inc.

## TRASH RECEPTACLES

Trash receptacles should be accessible to a wide variety of height and reach ranges. Therefore, trash receptacles should not be taller than 48" and should not have a reach to the center hole deeper than 12".



32 Gallon Perforated Trashcan  
Image Credit: All Purpose Manufacturing, Inc.

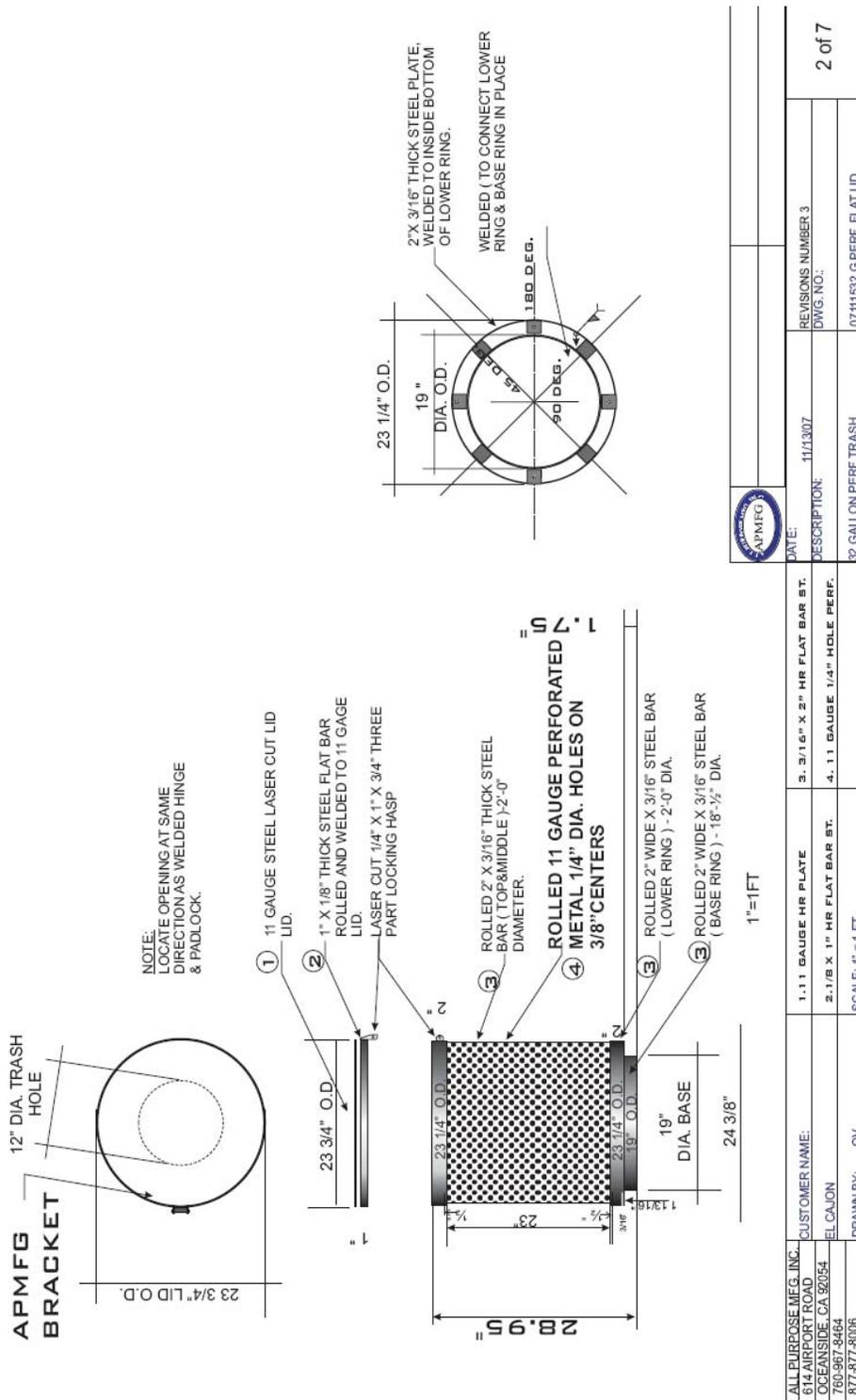


Figure 6-1. 32 Gallon Perforated Trashcan  
Source: All Purpose Manufacturing, Inc.







Figure 6-4. Trash receptacles offered by LNI Custom Manufacturing, Inc.  
Source: LNI Custom Manufacturing, Inc.

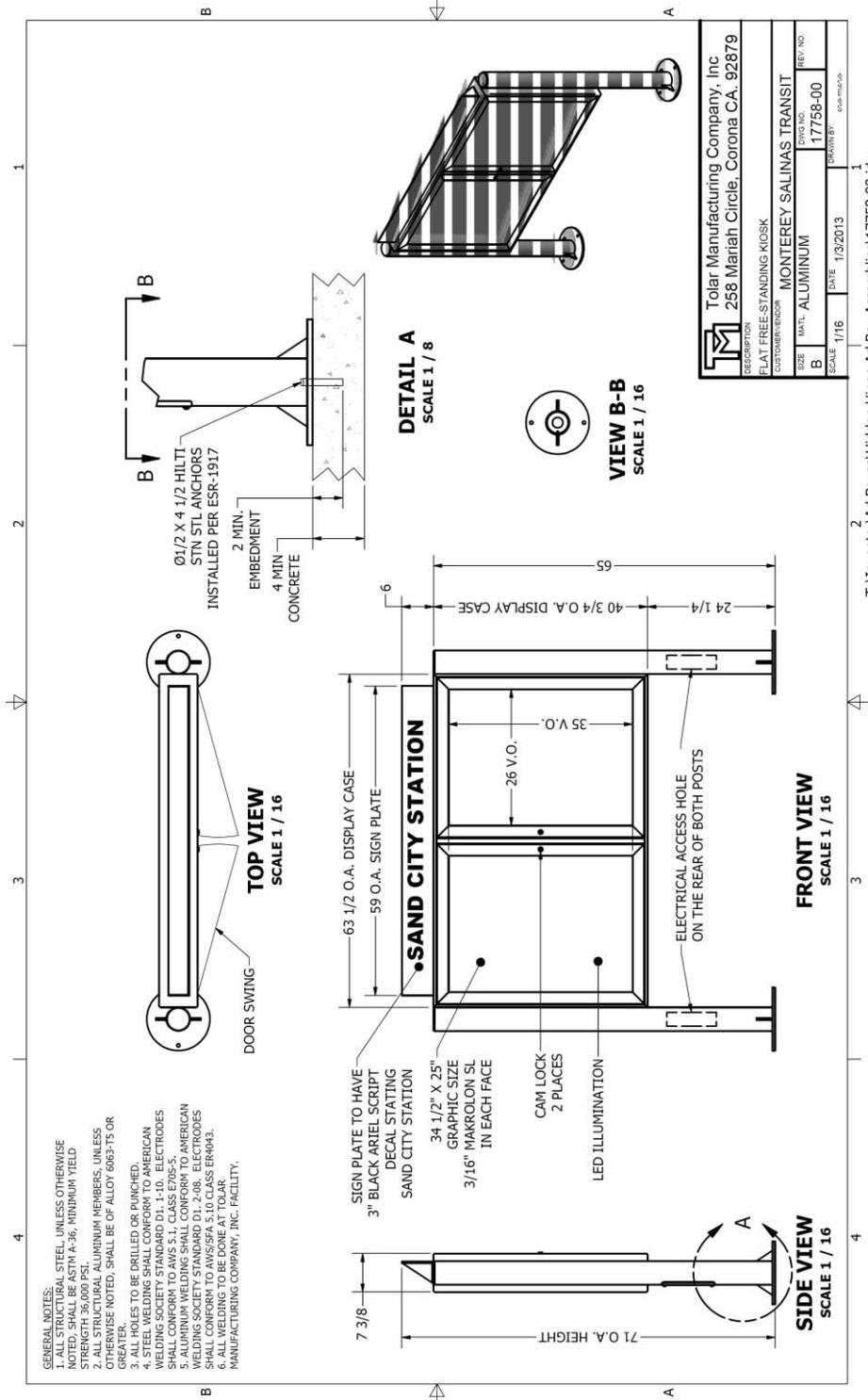
## BICYCLE STORAGE



Figure 6-5. Bicycle racks offered by LNI Custom Manufacturing, Inc.  
 Source: LNI Custom Manufacturing, Inc.

\*It should be noted that object that extends over 4 inches at heights over 27 inches is a protrusion. If selected, bicycle racks that fit these criteria should be placed in an alcove so that they do not pose a hazard to persons with visual impairments.

# KIOSKS



T:\Inventor\Ad Boxes\Hidden Hinge Ad Box Assemblies\17758-00.idw

Figure 6-6. Example compliant kiosk  
 Source: Tolar Manufacturing, Inc.

**The LNI Three sided Ad Panel** is ideal for all your advertising needs. The Medium "V" configuration offers a 360 Degree view. Best used in open environments, allowing for visibility of all three ads. The all metal construction is done in-house and is BUY AMERICA compliant.

**Specifications:**

- 1/8" Aluminum Sheet
- 3 1/2" Schedule 40 Aluminum pipe
- 1/4" Tempered Glass
- LED Illumination
- 110 Volt or Solar Options

**Mounting:**

- Surface mounted with 4x, 1/2" x 4-1/2" anchor bolts (by others)

**Finish:**

- Powder Coat (3-5mil)



**Other Configurations**

**Wide "V"**  
For small areas, allows for increased visibility without infringing upon pedestrian space.

**Narrow "V"**  
This configuration is best for wall mounting or in smaller areas.

**Flat**  
Allows for two advertisements and fits tightly against a surface or stands alone.

Standard Ad Size – 4' x 6'

Figure 6-7. LNI Three-sided Ad Panel  
Source: LNI Custom Manufacturing Inc

The LNI Two sided Ad Panel is ideal for all your advertising needs. The Flat configuration allows for two advertisements and fits tightly against a surface or stands alone. The all metal construction is done in-house and is BUY AMERICA compliant.

**Specifications:**

- 1/8" Aluminum Sheet
- 3 1/2" Schedule 40 Aluminum pipe
- 1/4" Tempered Glass
- LED Illumination
- 110 Volt or Solar Options

**Mounting:**

- Surface mounted with 4x, 1/2" x 4-1/2" anchor bolts (by others)

**Finish:**

- Powder Coat (3-5mil)



**Other Configurations**

**Wide "V"**  
For small areas, allows for increased visibility without infringing upon pedestrian space.

**Medium "V"**  
Offers a 360 Degree view. Best used in open environments, allowing visibility of all three ads.

**Narrow "V"**  
This configuration is best for wall mounting or in smaller areas.

Standard Ad Size – 4' x 6'

Figure 6-8. LNI Two-sided Ad Panel  
Source: LNI Custom Manufacturing Inc

## LIGHTING AND SECURITY

The presence or lack of lighting at bus stops greatly affects the bus patron's perception of safety. Adequate lighting should be provided to enhance the passenger's sense of comfort while waiting for busses. In addition, poor lighting may encourage vandalism and other unintended uses of amenities at bus stops.

Telephones should also be provided at transportation facilities to enhance passenger safety. In the case of an emergency, patrons should be able to easily access public telephones.

### 217.4.7 Transportation Facilities.

In transportation facilities, in addition to the requirements of 217.4.1 through 217.4.4, where at least one public pay telephone serves a particular entrance to a bus or rail facility, at least one public TTY shall be provided to serve that entrance. (2010 ADA Standards for Accessible Design)



Well-lit bus stop.

Photo credit: El Pollock

The following products are recommended to enhance lighting security at bus stops:

# ALL PURPOSE MFG. INC. SOLAR BUS STOP LED LIGHT

APMFG SOLAR BUS STOP LED LIGHT POLE

**SPECS:**

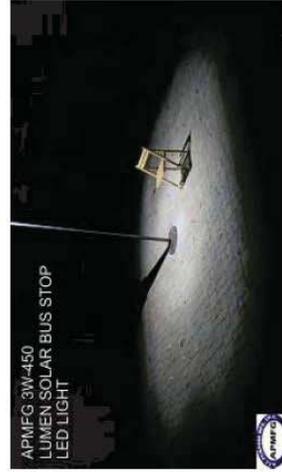
- 20 WATT 12 VOLT SOLAR PANEL
- HEAVY DUTY ALUMINUM FORMED FIXTURE HOUSING
- PRECISION MACHINED APMFG- ELLIPTICAL LENS
- CREE 3WATT HIGH POWER COOL WHITE LED (450) LUMEN OUTPUT
- 1/4" CLEAR LEXAN LENS VANDAL RESISTANT
- 12 VOLT DC AGM 12 AMP-HR SOLAR BATTERY
- 6AMP CIRCUIT BREAKER
- LUMENS @ 3 WATTS = 450
- TAMPER PROOF STAINLESS STEEL HARDWARE



APMFG SOLAR BUS STOP LED LIGHT POLE

**SETTINGS:**

- CHARGE CONTROLLER OPERATING SETTINGS
- OFF
- 2 HOURS ON
- 4 HOURS ON
- 6 HOURS ON
- 8 HOURS ON
- 10 HOURS ON
- 3 / OFF / 1
- 4 / OFF / 2
- 6 / OFF / 2
- DUSK TO DAWN



ALL PURPOSE MFG. INC. 614 AIRPORT ROAD OCEANSIDE, CA 92054 760-937-8464 877-877-8006	CUSTOMER NAME: REDDING	DATE: 8/10/16	REVISIONS NUMBER DWG. NO.:	1 OF 2
①	②	③	④	
SCALE: 0/	⑤	⑥	⑦	⑧
			SOLAR BUS STOP LED LIGHT	

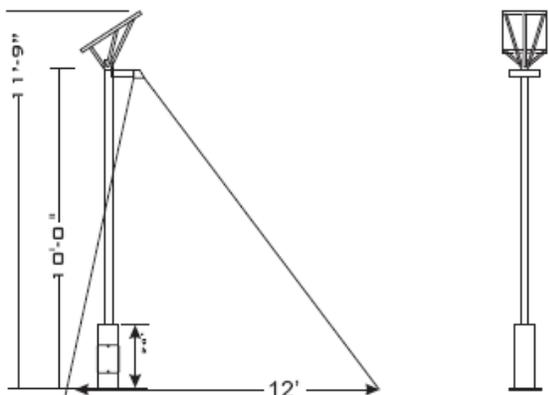
Figure 6-9. 20-watt solar bus stop LED lighting  
Source: All Purpose Manufacturing, Inc.



# All Purpose Mfg. Inc. New Ar825 60 Watt Solar LED Bus Stop Light

## NEW Solar Bus Stop LED Light 60 watt 825 LED Street Light

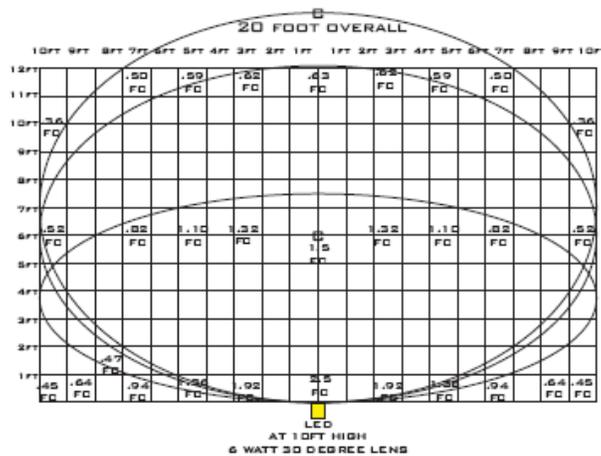
PN# AP-60W-12v-825L  
60watt LED 12 volt to 36 volt DC input



Light illumination measured at 10' high or per your specifications.  
Illumination spread measured from 10' high. Spread 12ft forward x 10 ft left and right.

All Aluminum .120" Thick formed Design Combination best in class high power LEDs Cool White Flux and use of low and high output leds for maximum illumination 5 year warranty.  
1/4" thick frosted lexan lens  
Optics used for maximum spread.

60 watt 12 volt DC or AC Input  
easy female connection with hardware.  
Aluminum formed 5052 Tig and Mig welded for maximum heat dissipation and strength.



All Purpose Mfg. Inc. 614 Airport Road, Oceanside, CA 92058  
[www.apmfgsolar.com](http://www.apmfgsolar.com) email [mgmt@apmfg.net](mailto:mgmt@apmfg.net) Ph.760-967-8464

Figure 6-11. New Ar825 60-watt solar bus stop LED lighting  
Source: All Purpose Manufacturing, Inc.

## BENCHES

R308.2 Transit Shelters. Where seating is provided within transit shelters, the clear space shall be located either at one end of a seat or shall not overlap the area within 460 mm (1.5 ft) from the front edge of the seat. (PRoWAG)

Advisory R308.2 Transit Shelters. The clear space must be located entirely within the transit shelter and not interfere with other persons using the seating. (PRoWAG)

903.1 General. Benches shall comply with 903.

903.2 Clear Floor or Ground Space. Clear floor or ground space complying with 305 shall be provided and shall be positioned at the end of the bench seat and parallel to the short axis of the bench.

903.3 Size. Benches shall have seats that are 42 inches (1065 mm) long minimum and 20 inches (510 mm) deep minimum and 24 inches (610 mm) deep maximum.

903.4 Back Support. The bench shall provide for back support or shall be affixed to a wall. Back support shall be 42 inches (1065 mm) long minimum and shall extend from a point 2 inches (51 mm) maximum above the seat surface to a point 18 inches (455 mm) minimum above the seat surface. Back support shall be 2 1/2 inches (64 mm) maximum from the rear edge of the seat measured horizontally.

Advisory 903.4 Back Support. To assist in transferring to the bench, consider providing grab bars on a wall adjacent to the bench, but not on the seat back. If provided, grab bars cannot obstruct transfer to the bench.

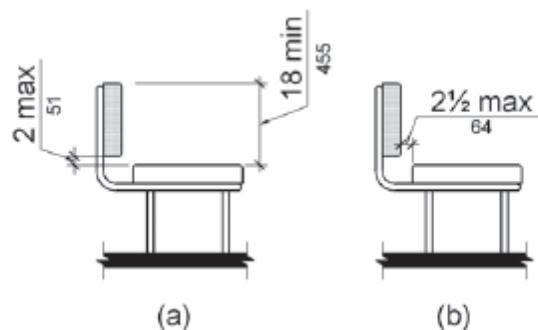


Figure 6-12. Bench specifications.

Source: PRoWAG

903.5 Height. The top of the bench seat surface shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum above the finish floor or ground.

903.6 Structural Strength. Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the seat, fastener,

mounting device, or supporting structure.

903.7 Wet Locations. Where installed in wet locations, the surface of the seat shall be slip resistant and shall not accumulate water.

(2010 ADA Standards for Accessible Design)

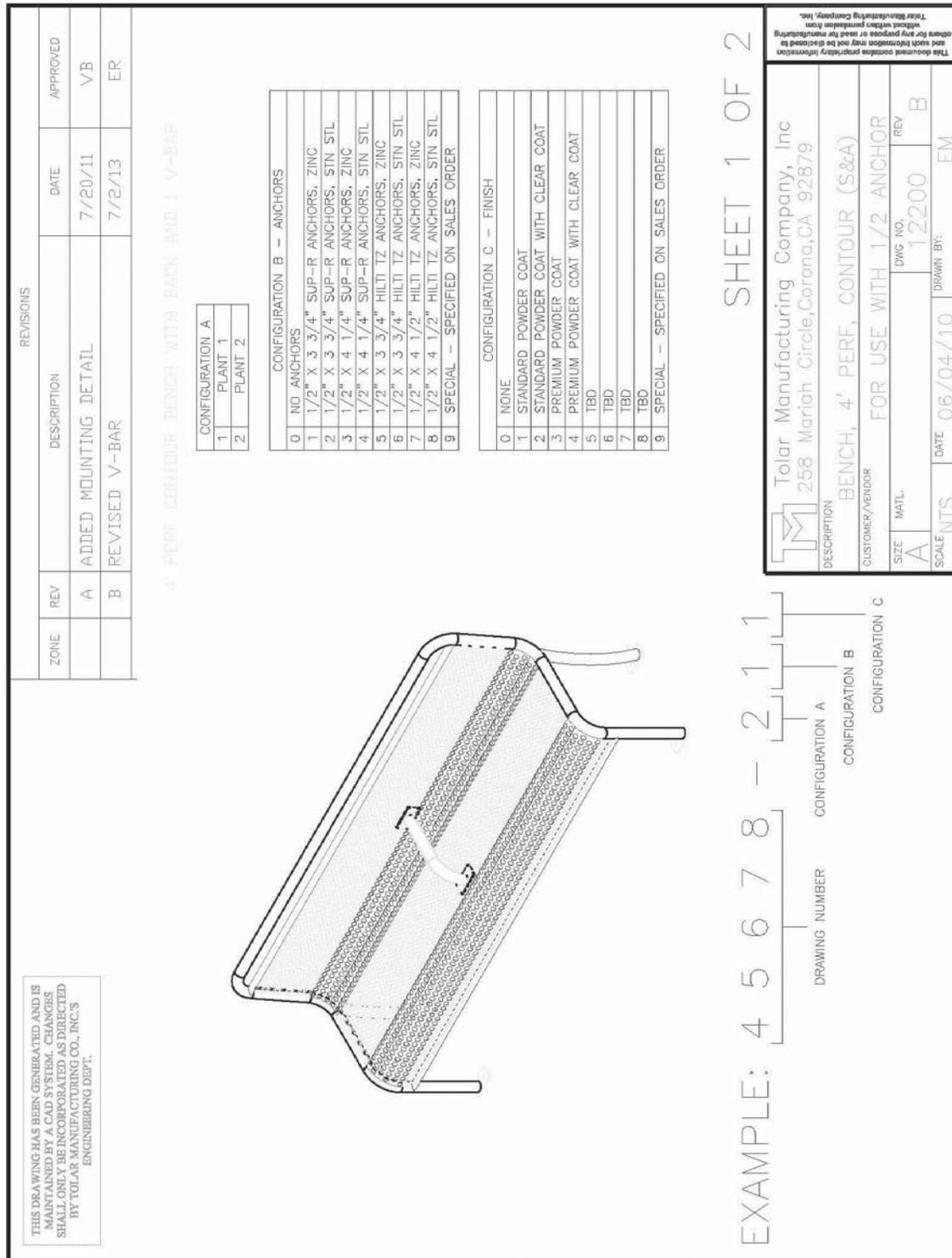


Figure 6-13. Example compliant bench  
Source: Tolar Manufacturing, Inc.

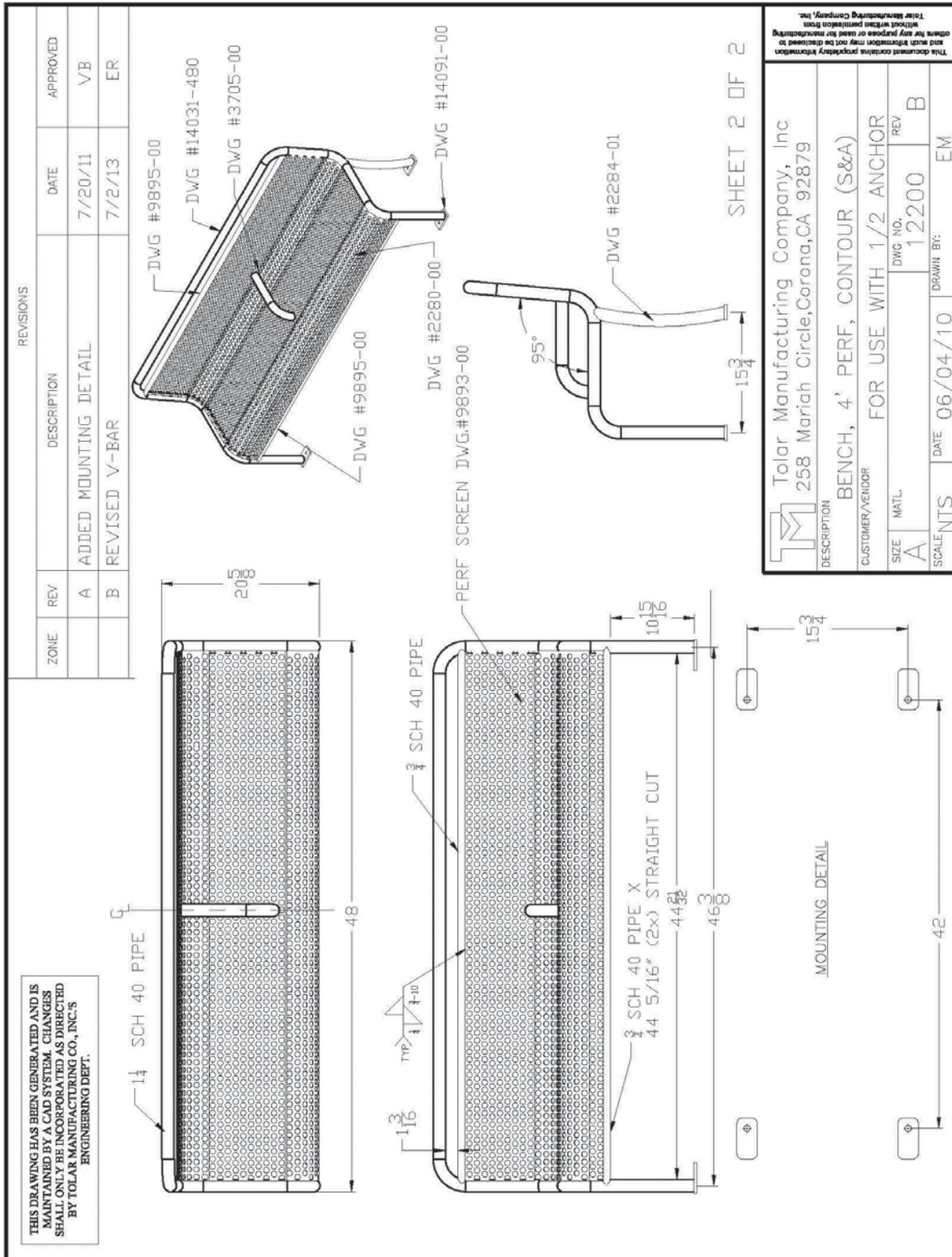


Figure 6-14. Example compliant bench  
Source: Tolar Manufacturing, Inc.

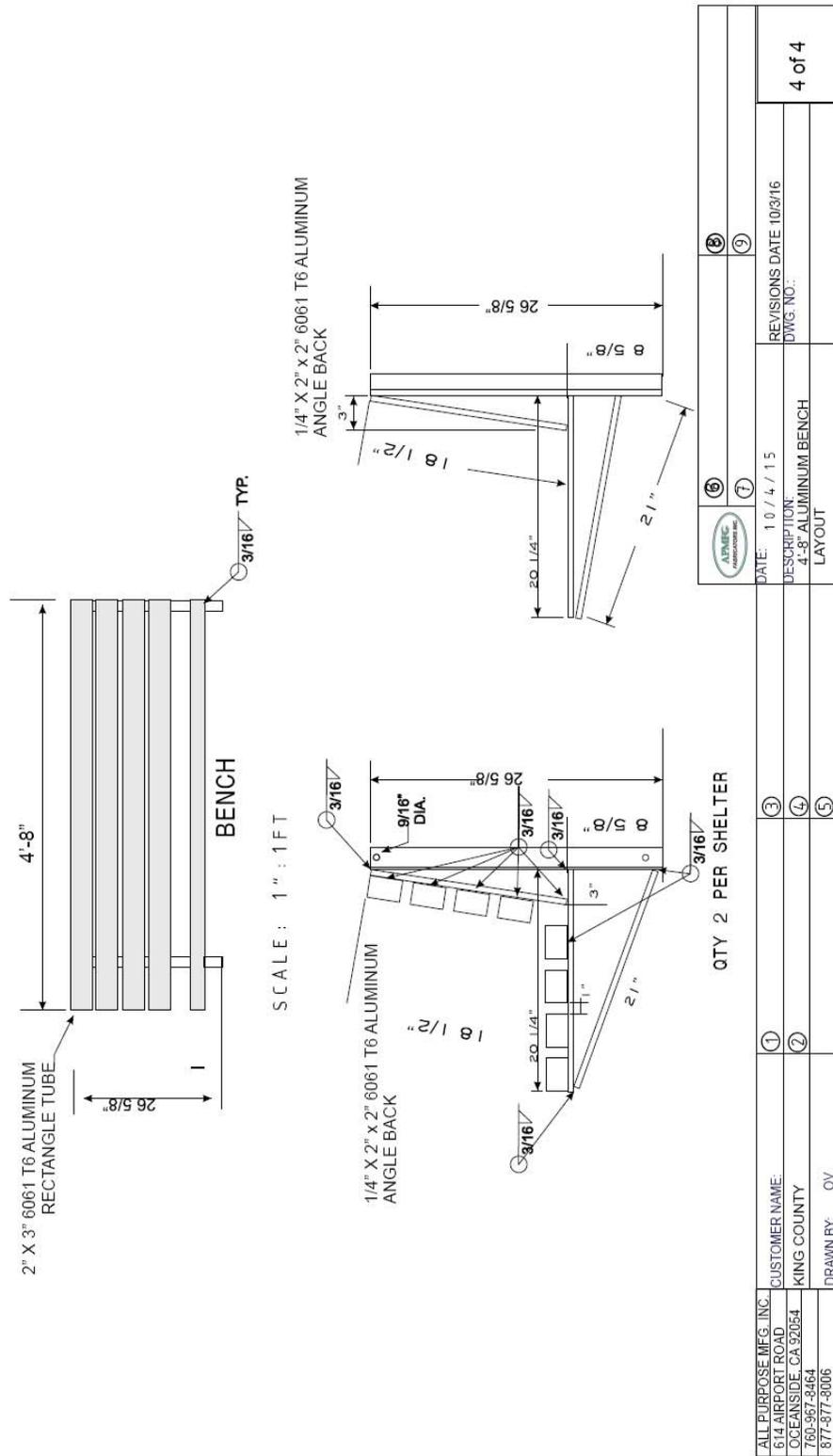


Figure 6-15. Example compliant bench  
Source: All Purpose Manufacturing, Inc.

## BUS SHELTERS

218.4 Bus Shelters. Where provided, bus shelters shall comply with 810.3.

810.3 Bus Shelters. Bus shelters shall provide a minimum clear floor or ground space complying with 305 entirely within the shelter. Bus shelters shall be connected by an accessible route complying with 402 to a boarding and alighting area complying with 810.2.

(2010 ADA Standards for Accessible Design)



Figure 6-16. Example compliant bus shelter in Sonoma County.  
Source: Tolar Manufacturing, Inc.

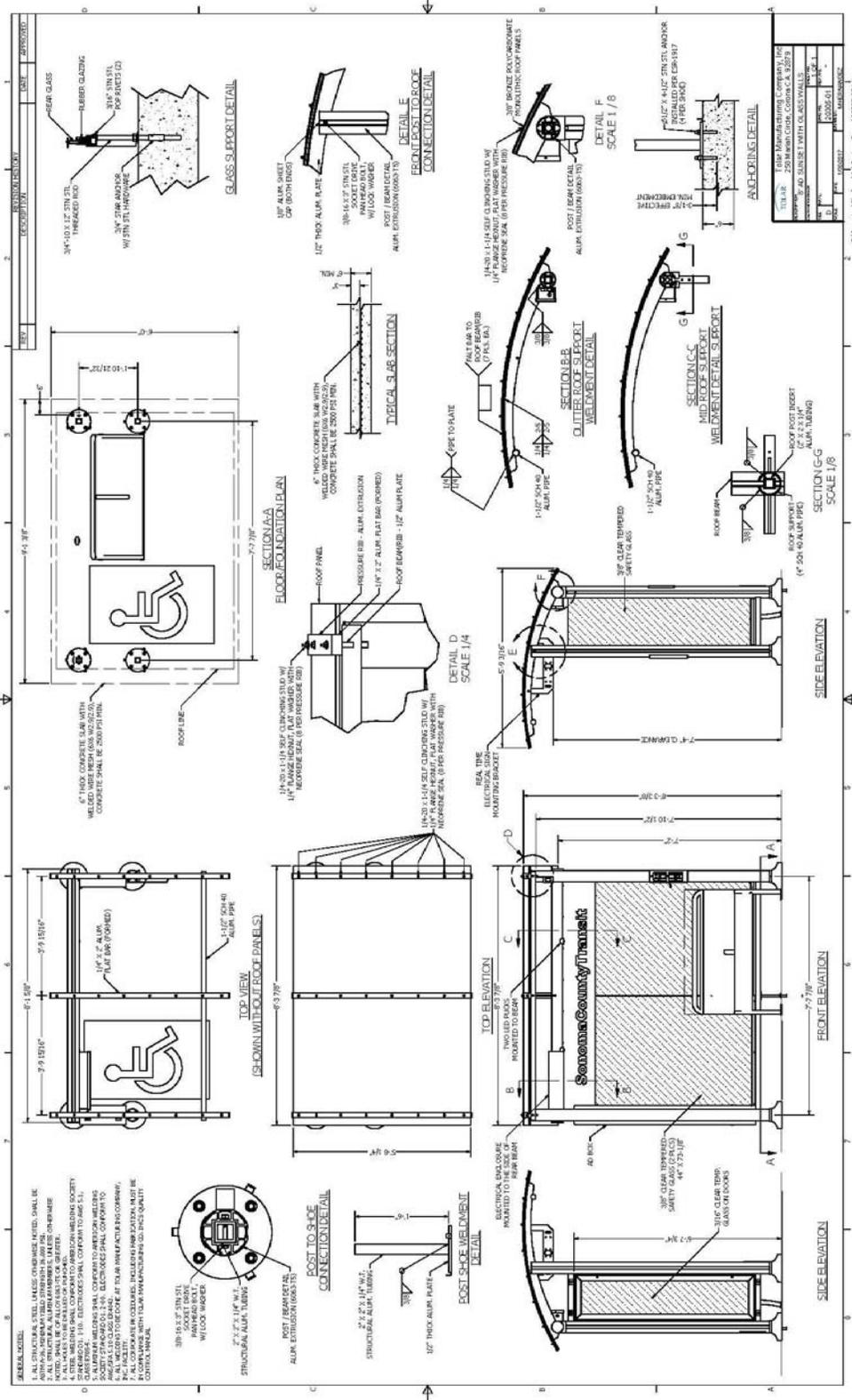


Figure 6-17. Example compliant bus shelter  
Source: Tolar Manufacturing, Inc.



Figure 6-17. Example compliant bus shelter with Dome Roof  
Source: All Purpose Manufacturing, Inc.

9'-6" x 5' DOME SOLAR ROOF SHELTER

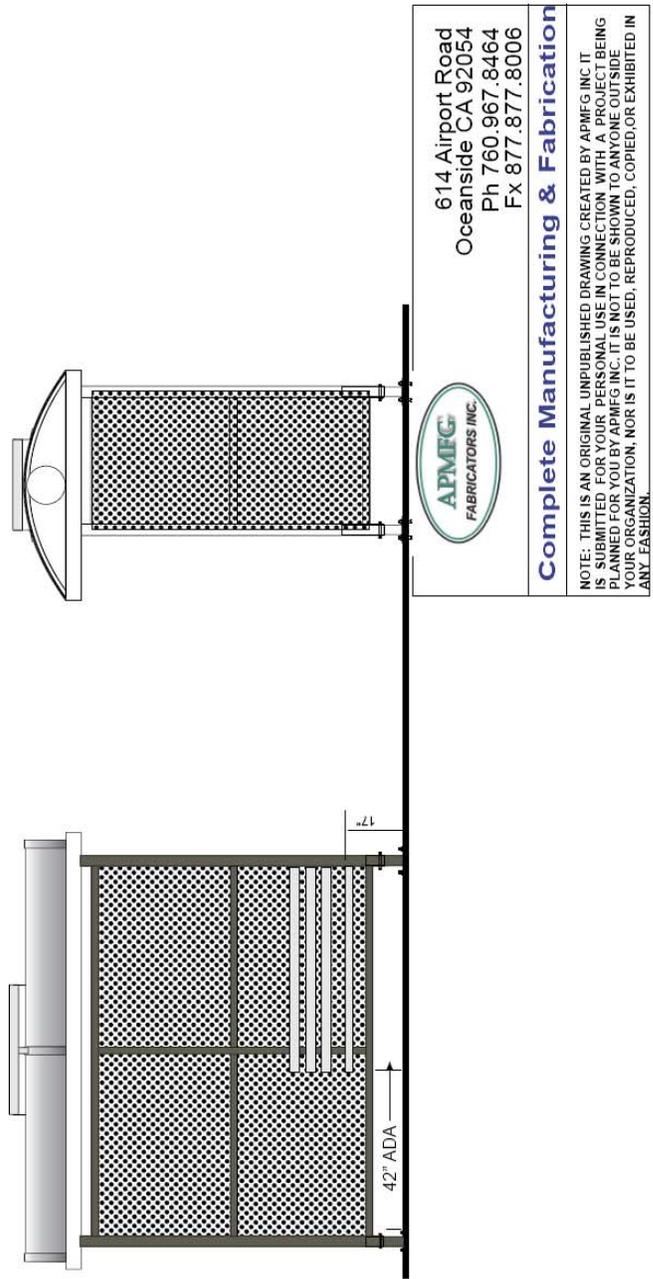


Figure 6-18. Example compliant bus shelter  
Source: All Purpose Manufacturing, Inc.

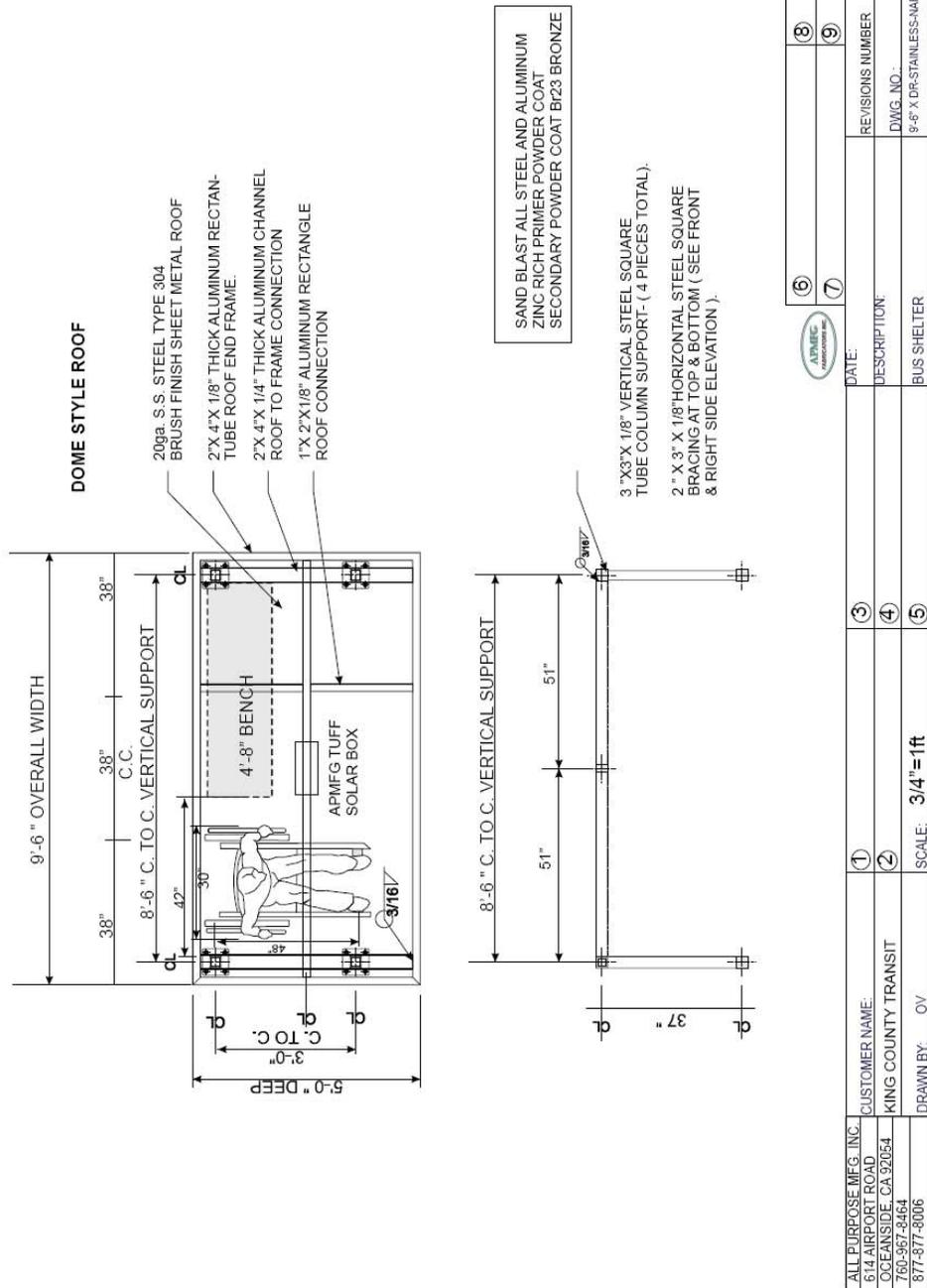
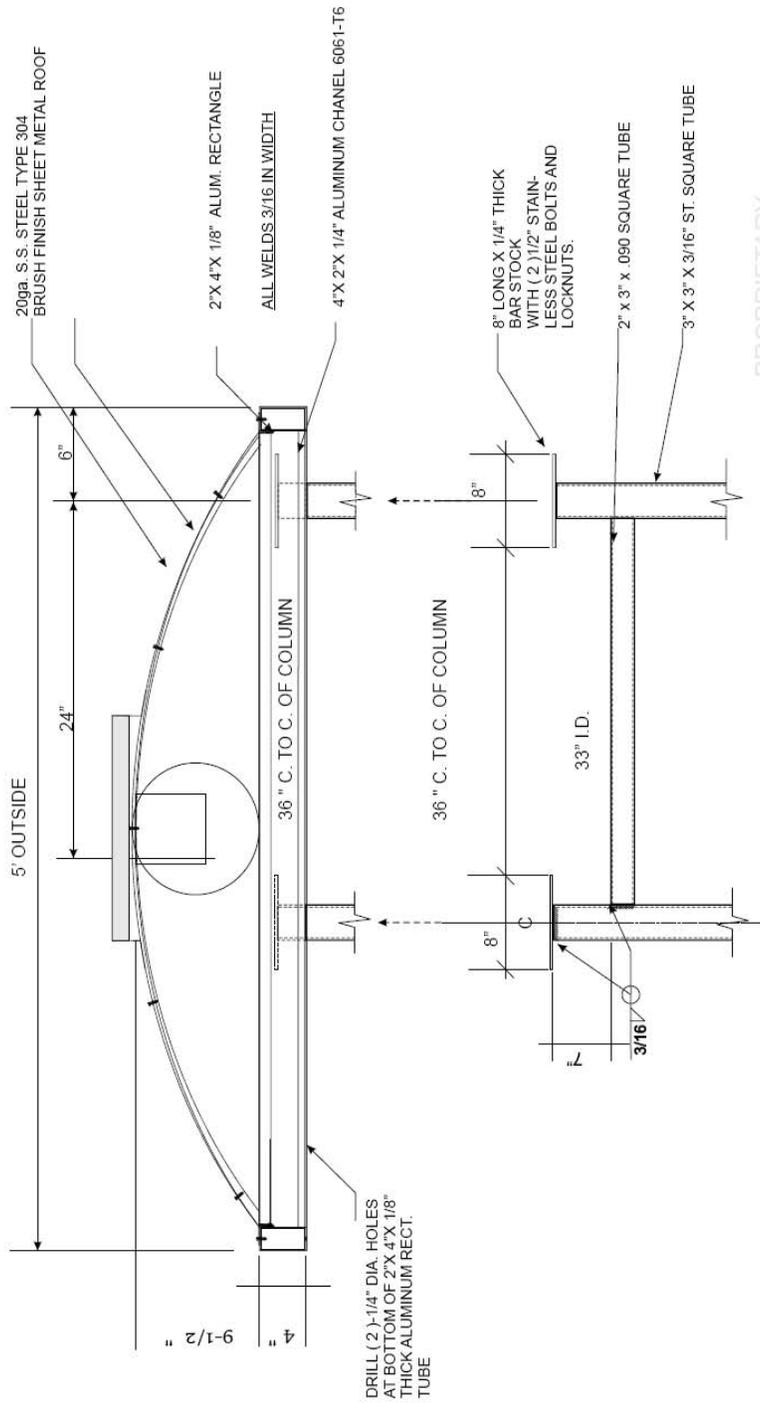


Figure 6-19. Example compliant bus shelter  
Source: All Purpose Manufacturing, Inc.



PROPRIETARY

LEFT SIDE ROOF SECTION

SCALE: 1-1/2"=1'-0"

ALL PURPOSE MFG. INC. 614 AIRPORT ROAD OCEANSIDE, CA 92054 760-967-8464 877-877-8006	CUSTOMER NAME: KING COUNTY TRANSIT	DATE: REVISIONS NUMBER DWG. NO.:	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨	2 of 4
DRAWN BY: OV		DESCRIPTION: DOME ROOF LAYOUT		

Figure 6-20. Example compliant bus shelter  
Source: All Purpose Manufacturing, Inc.

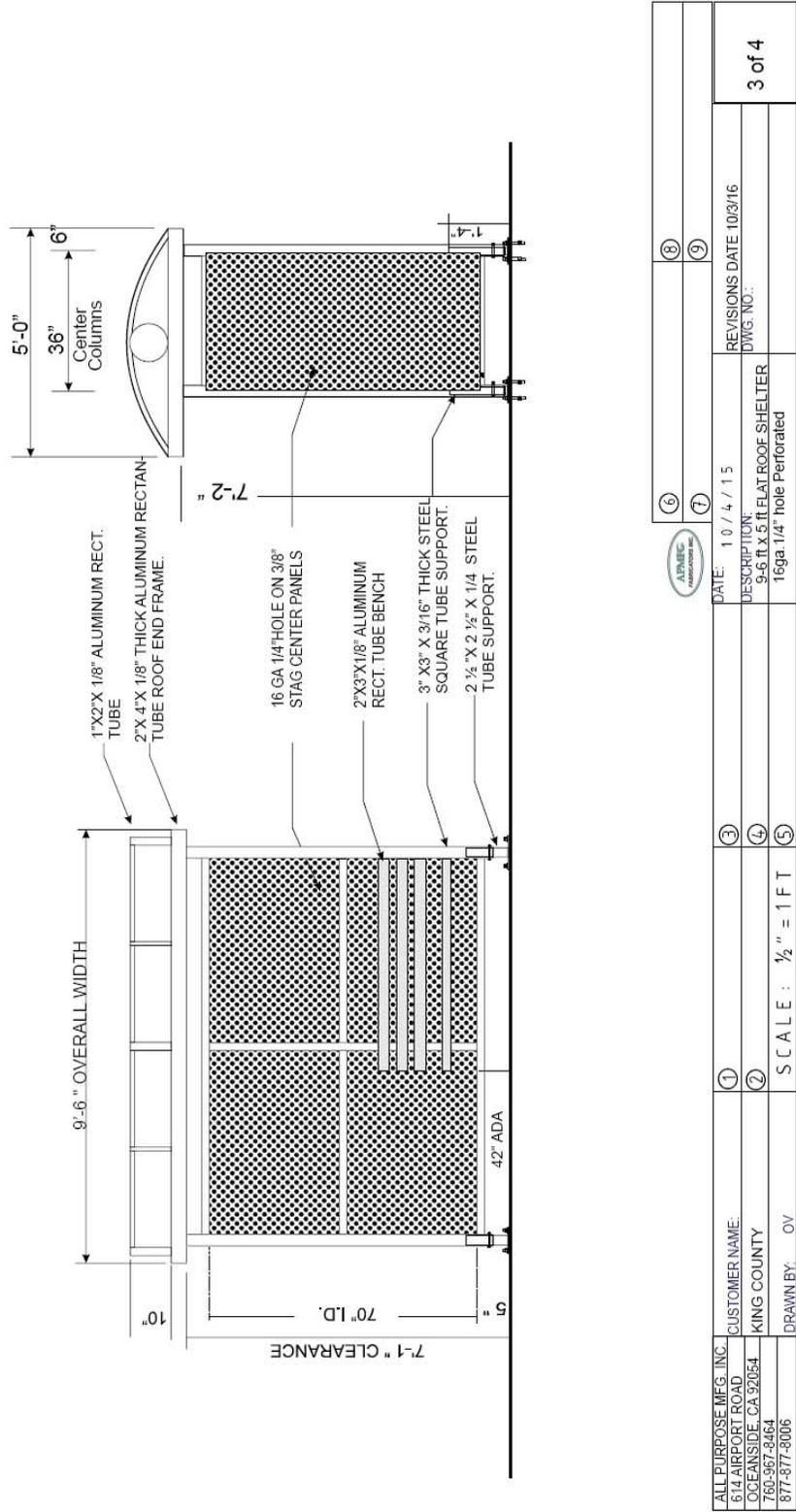


Figure 6-21. Example compliant bus shelter  
Source: All Purpose Manufacturing, Inc.

**01-9'-6"-02 FLAT ROOF SHELTER**

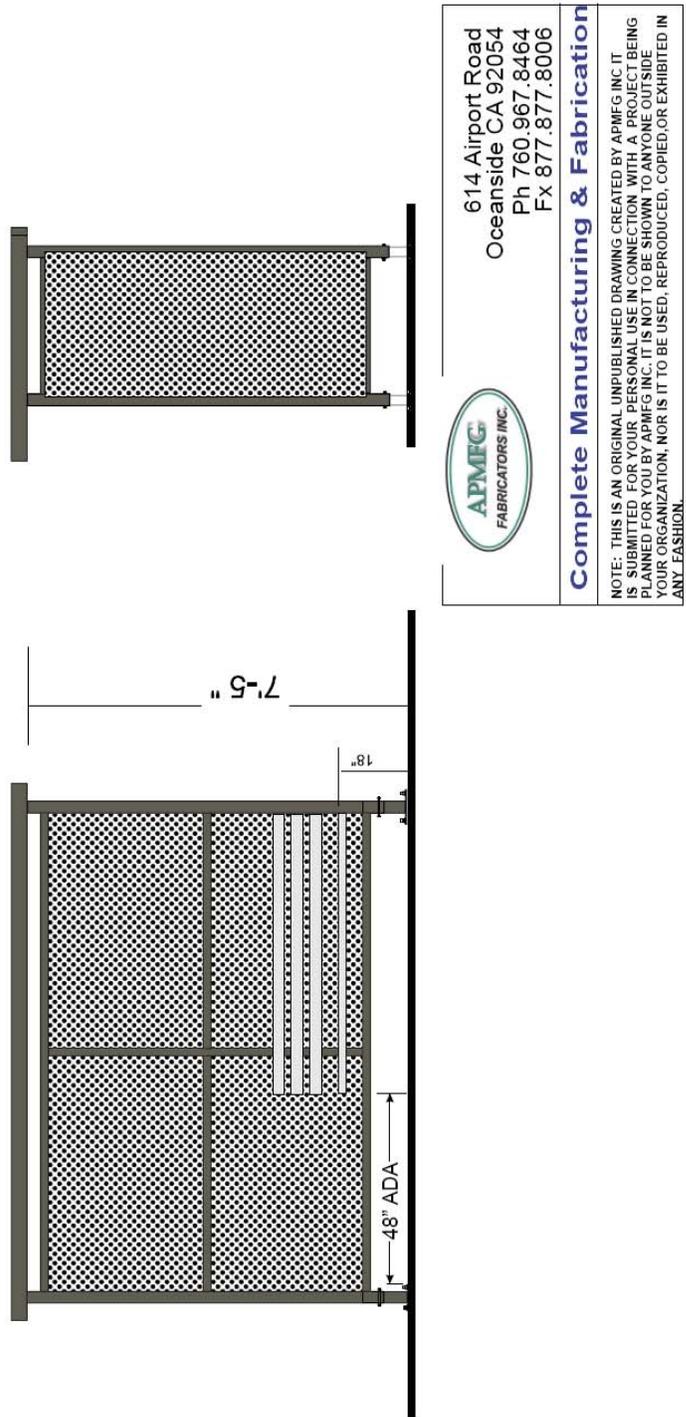


Figure 6-22. Example compliant bus shelter  
Source: All Purpose Manufacturing, Inc.

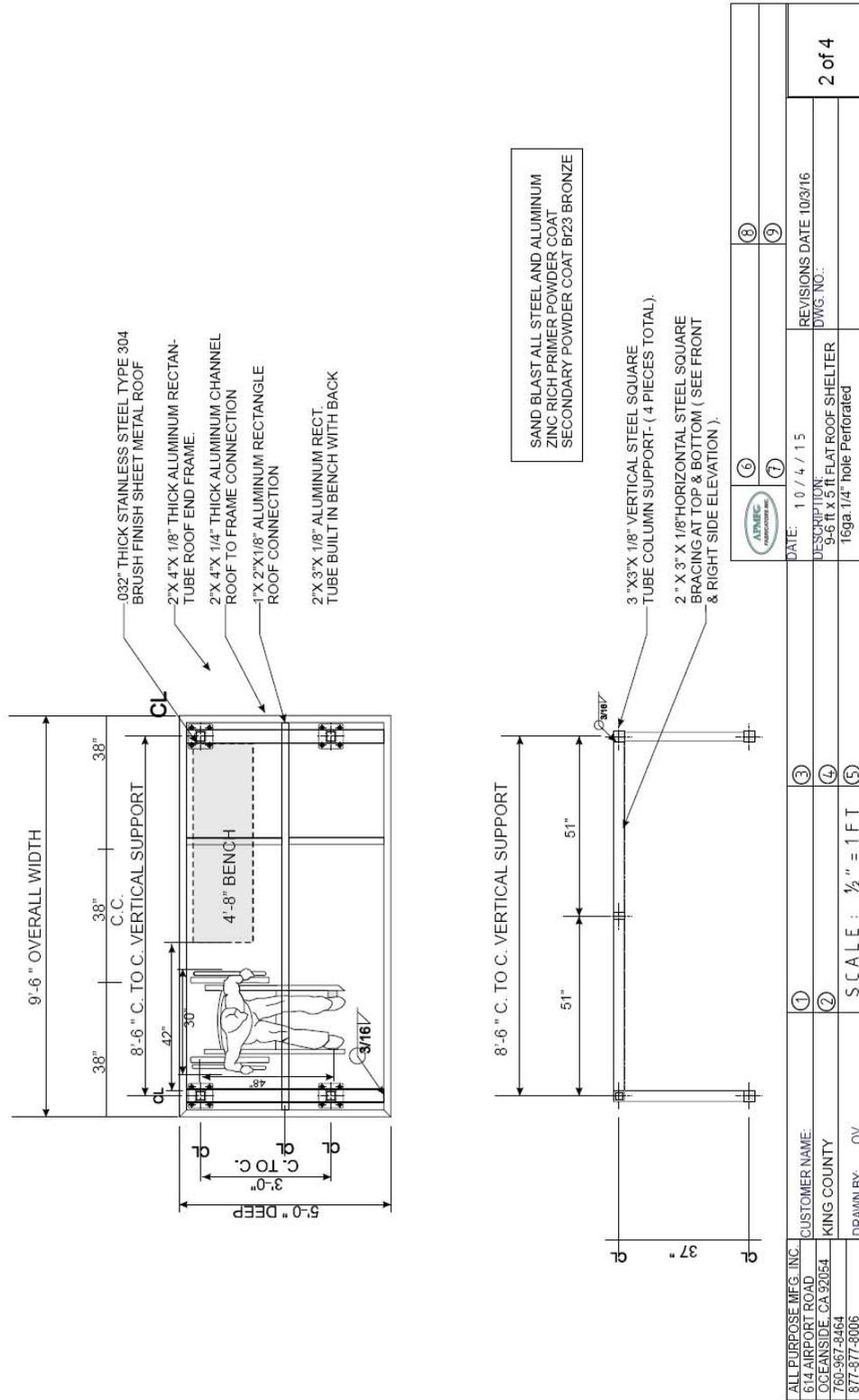


Figure 6-23. Example compliant bus shelter  
Source: All Purpose Manufacturing, Inc.

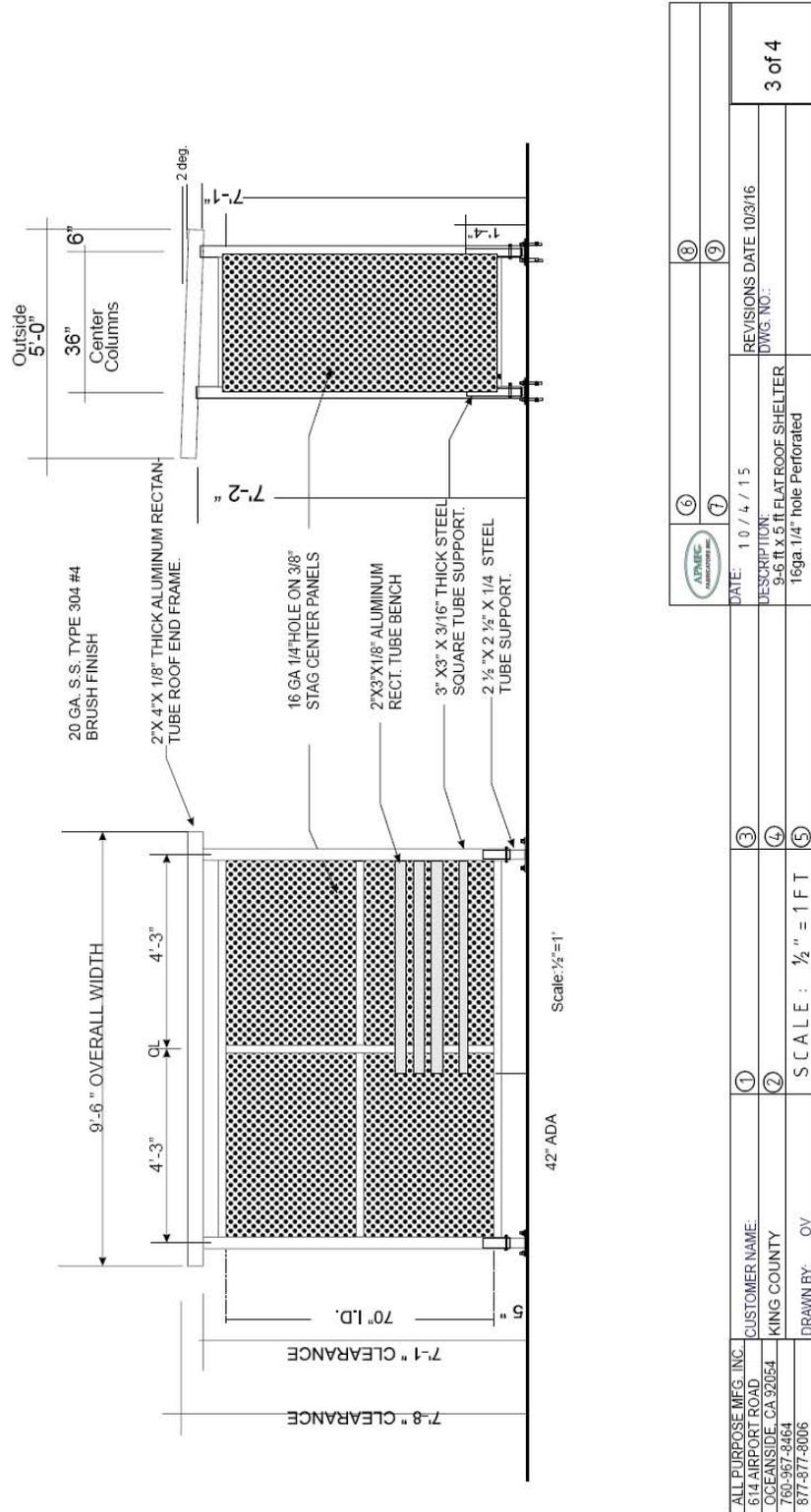


Figure 6-24. Example compliant bus shelter  
Source: All Purpose Manufacturing, Inc.

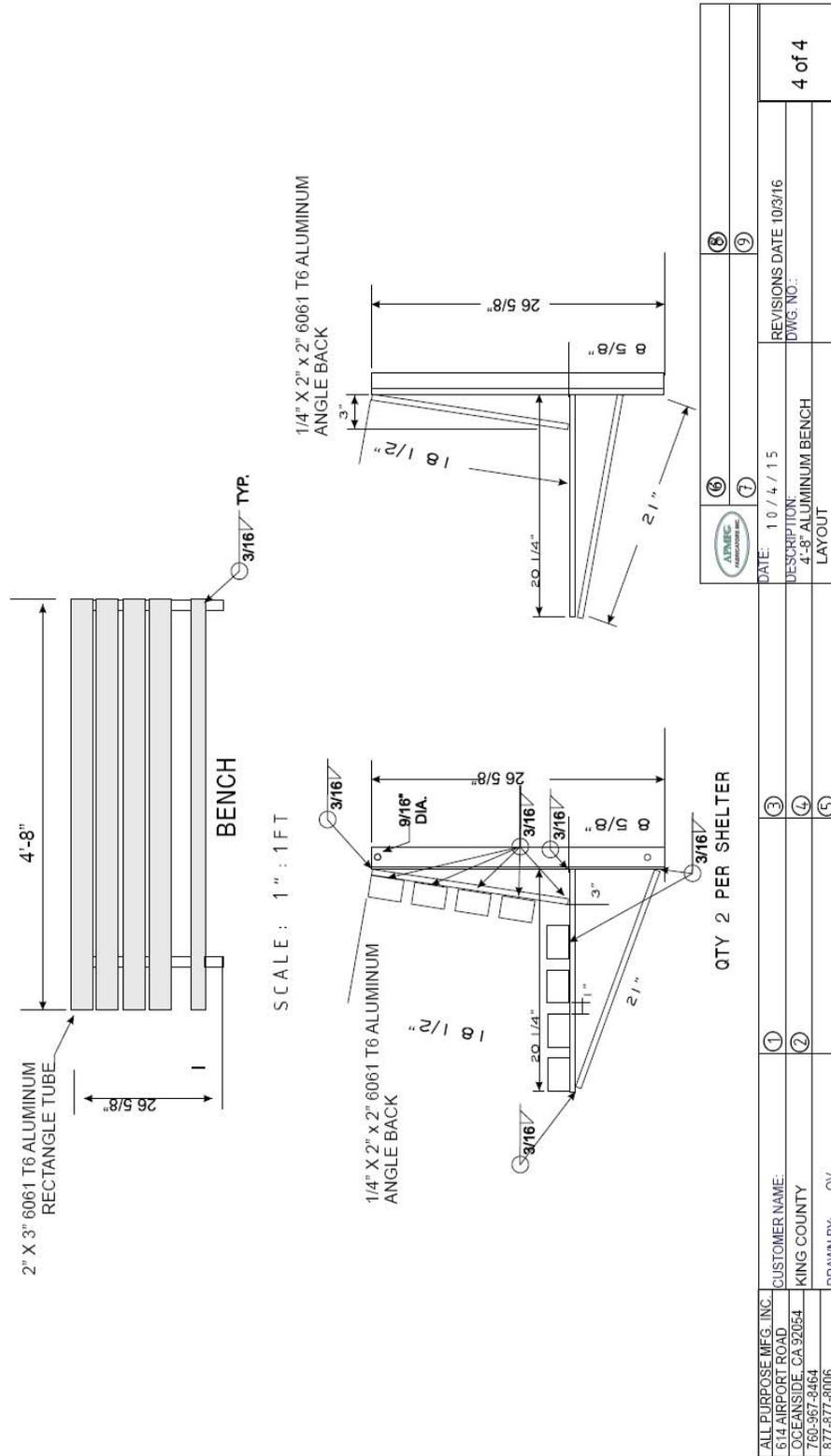


Figure 6-25. Example compliant bus shelter  
Source: All Purpose Manufacturing, Inc.

The LNI Classic Shelter is constructed of high quality aluminum and is built to suit your cost, timing and design needs. The shelter is fully fabricated in Hawthorne, CA and is BUY AMERICA compliant. Each Classic Shelter is built to meet and exceed your expectations and stands up to the harshest conditions.



Figure 6-26. Classic Shelter  
Source: LNI Custom Manufacturing, Inc.

**Features**



**Mark IV Extrusion**  
Equipped with paths for both electric and data cables as well as an integrated rain gutter.



**Ground Supports**  
Quick installation with superior strength & durability



**Roof Installation**  
Designed to accommodate different roof styles



**Modular Assembly**  
The Classic Shelter is built around the LNI Mark IV Extrusion, allowing for easy assembly.



**Solar Power**  
We offer many off-the-grid power solutions

**Specifications**

**Size:**

- Length - 9', 12', 15', 20', Custom
- Depth - 5', 6', Custom

**Configurations:**

- Roof Styles - Dome, Flat, Peak, Hip Peak
- Walls (Side, Back, Wind Screen) - Glass, Acrylic, Perforated, Victorian, Laser Cut
- Supports - Round or Square Tube / 2 1/2" or 3 1/2"

**Finish:**

- Powder Coat - 4-5 mil
- Anti-graffiti
- Please specify RAL#

**Accessories & Options:**

- Solar Power
- LED Illumination
- Graphics
- Benches
- Trash Receptacles
- Leaning Rails
- Bicycle Racks
- Advertising Panels
- Map / Schedule Cases



Figure 6-27. Features/specifications of LNI Custom Manufacturing, Inc. Classic Shelter  
Source: LNI Custom Manufacturing, Inc.

**The LNI Journey Series Shelter** is of high quality aluminum construction and built to suit your cost, timing and design needs. The shelter is fully fabricated and assembled in-house and is BUY AMERICA compliant. Each Journey Shelter is built to meet and exceed your expectations and stands up to the harshest conditions.



Figure 6-28. Journey Shelter  
Source: LNI Custom Manufacturing, Inc.

Features	Specifications:
 <p><b>Mark IV Extrusion</b> Equipped with paths for both electric and data cables as well as an integrated rain gutter.</p>	<p><b>Size:</b>                      Length - 9', 12', 15', 20', Custom                      Depth - 5', 6', Custom</p> <p><b>Configurations:</b>                      Roof Styles - Dome, Flat, Peak, Hip Peak, Wave                      Walls (Side, Back, Wind Screen) - Glass, Acrylic, Perforated, Victorian, Laser Cut                      Supports - Square Tube / 2 1/2" or 3"</p> <p><b>Finish:</b>                      Powder Coat - 4-5 mil                      - Anti-graffiti                      - Please specify RAL#</p>
 <p><b>Roof Installation</b> Designed to accommodate different roof styles.</p>	<p><b>Accessories &amp; Options:</b>                      Solar Power                      LED Illumination                      Graphics                      Benches                      Trash Receptacles                      Leaning Rails                      Bicycle Racks                      Advertising Panels                      Map / Schedule Cases</p>
 <p><b>Modular Construction</b> Allows for any number of sizes and configurations</p>	
 <p><b>Window Panels</b> Custom Extrusions allow for 1/4" or 3/8" Glass</p>	
 <p><b>Ground Supports</b> Quick installation with superior strength &amp; durability</p>	

Figure 6-29. Features/specifications of LNI Custom Manufacturing, Inc. Journey Shelter  
 Source: LNI Custom Manufacturing, Inc.

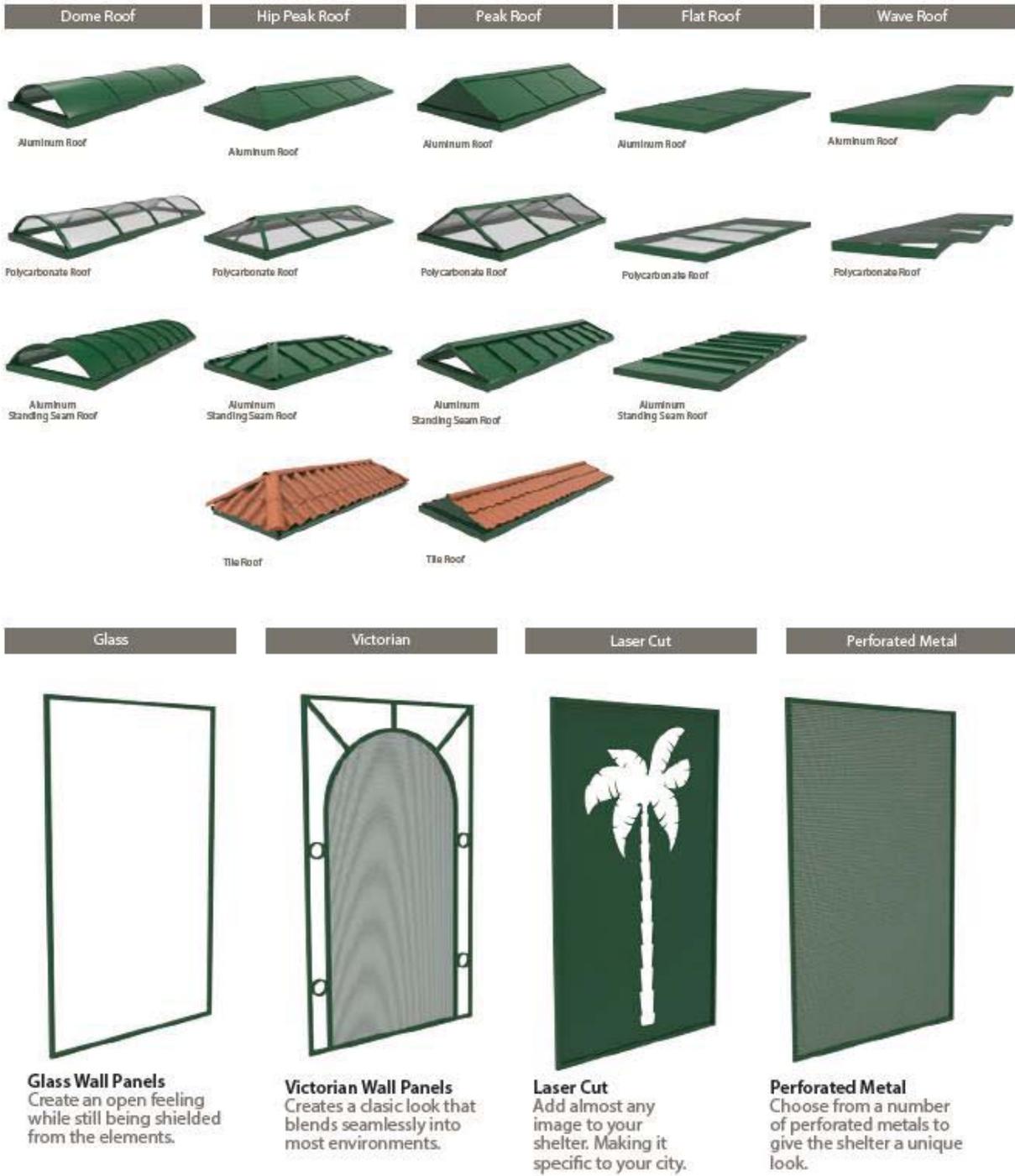


Figure 6-30. Styles/materials of LNI Custom Manufacturing, Inc. Journey Shelter  
Source: LNI Custom Manufacturing, Inc.

LNI offers its Oasis Shelter, tailored to meet the needs of any Municipality/agency. Designed with low maintenance and longevity in mind, the Oasis Shelter features all aluminum construction and modular assembly. All LNI shelters are fabricated in California and are BUY AMERICA compliant.

The Oasis Shelters modular construction allows for multiple sizes and configurations. This construction method also allows for different roof and wall styles.

\*Feel free to ask for additional options and customizations\*

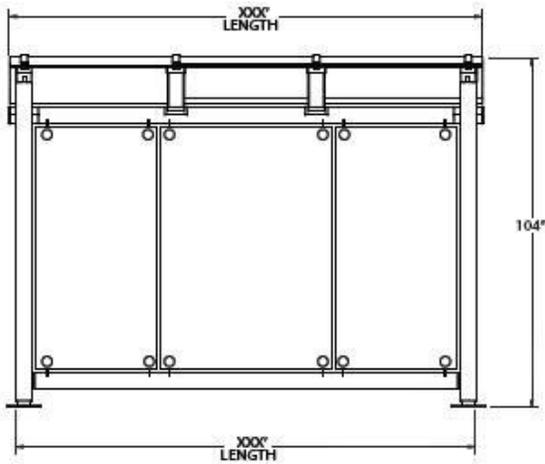
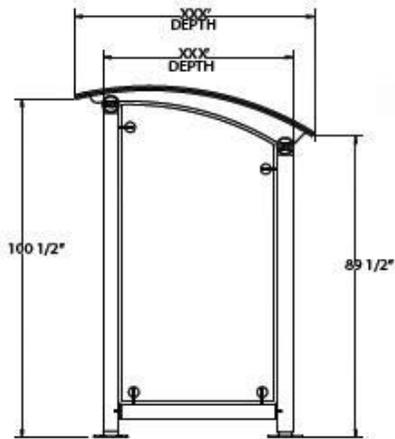


Figure 6-31. Oasis Shelter  
Source: LNI Custom Manufacturing, Inc.

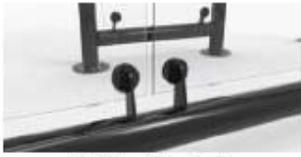
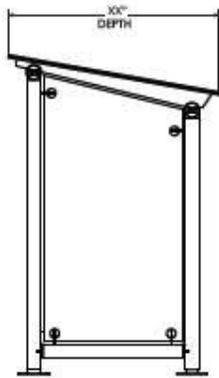
<b>Features</b>	<b>Specifications:</b>
 <p><b>Solar Power</b> We offer off-the-grid power solutions</p>  <p><b>Illumination</b> Integrated LED lights provide illumination with hidden fixtures</p>  <p><b>Wall Panel Installation</b> Designed to accommodate different wall panel styles</p>	<p><b>Size:</b></p> <p>Length - Available in 8', 12', 16', 20' lengths Depth - Available in 5', 8' depths</p> <p><b>Configurations:</b></p> <p>Roof Styles - Dome, Flat, Arch Walls (Side, Back, Wind Screen) - Glass, Acrylic Supports - Round Tube / 2 1/2" or 3"</p> <p><b>Finish:</b></p> <p>Powder Coat - 4-5 mil thickness - Anti-graffiti - Please specify RAL#</p> <p><b>Accessories &amp; Options:</b></p> <p>Solar Power LED Illumination Graphics Benches Trash Receptacles Leaning Rails Bicycle Racks Advertising Panels Map / Schedule Cases</p>
<b>Roof Styles / Materials</b>	
 <p><b>Flat Roof</b> Aluminum or Acrylic</p>  <p><b>Dome Roof</b> Aluminum or Acrylic</p>  <p><b>Arched Roof</b> Aluminum or Acrylic</p>	

Figure 6-32. Features/specifications of LNI Custom Manufacturing, Inc. Oasis Shelter  
Source: LNI Custom Manufacturing, Inc.

# APPENDICES

## PARATRANSIT POLICY

## INSTALLATION INSTRUCTIONS FOR 9' FLAT-AD BUS STOP SHELTERS

## GLOSSARY OF TERMS

## PARATRANSIT POLICY

Kings Area Rural Transit's Paratransit Policy is consistent with the Department of Transportation's Policy on Origin-to-Destination Service outlined below:

### Origin-to-Destination Service

#### DEPARTMENT OF TRANSPORTATION DISABILITY LAW GUIDANCE

The Department of Transportation's ADA regulation provides that complementary paratransit service for ADA paratransit eligible persons shall be "origin-to-destination" service. What are the obligations of transit providers to ensure that eligible passengers receive "origin-to-destination" service?

The Department's ADA regulation, 49 CFR §37.129(a), provides that, with the exception of certain situations in which on-call bus service or feeder paratransit service is appropriate, "complementary paratransit service for ADA paratransit eligible persons shall be origin-to-destination service." This term was deliberately chosen to avoid using either the term "curb-to-curb" service or the term "door-to-door" service and to emphasize the obligation of transit providers to ensure that eligible passengers are actually able to use paratransit service to get from their point of origin to their point of destination.

The preamble discussion of this provision made the following points:

Several comments asked for clarification of whether [origin-to-destination] service was meant to be door-to-door or curb-to-curb, and some recommended one or the other, or a combination of the two. The Department declines to characterize the service as either. *The main point, we think, is that the service must go from the user's point of origin to his or her destination point.* It is reasonable to think that service for some individuals or locations might be better if it is door-to-door, while curb-to-curb might be better in other instances. This is exactly the sort of detailed operational decision best left to the development of paratransit plans at the local level. (56 FR 45604; September 6, 1991; emphasis added.)

In the local paratransit planning process, it would be consistent with this provision for a transit provider to establish either door-to-door or curb-to-curb service as the basic mode of paratransit service. Where the local planning process establishes curb-to-curb service as the basic paratransit service mode, however, provision should still be made to ensure that the service available to each passenger actually gets the passenger from his or her point of origin to his or her destination point. To meet this origin to destination requirement, service may need to be provided to some individuals, or at some locations, in a way that goes beyond curb-to-curb service.

For instance, the nature of a particular individual's disability or adverse weather conditions may prevent him or her from negotiating the distance from the door of his or her home to the curb. A physical barrier (e.g., sidewalk construction) may prevent a passenger from traveling between the curb and the door of his or her destination point. In these and similar situations, to ensure that service is actually provided "from the user's point of origin to his or her destination point," the

service provider may need to offer assistance beyond the curb, even though the basic service mode for the transit provider remains curb-to-curb.

Because arranging for assistance beyond the curb may require additional time on the transit provider's part, we believe that it would be reasonable for the transit provider to ask for advance notice from the passenger of a need for this assistance. This would give the provider the opportunity to evaluate how to meet the need, as well as potential obstacles to providing it. In the case of a passenger who sought this assistance on a regular basis, this notice could be provided as part of the application process for paratransit eligibility or at the time that a change in circumstances made regular provision of assistance necessary. In the case of a passenger who sought this assistance on an occasional basis, we think that asking for advance notice at the time of reservation for the trip would be reasonable and consistent with the next-day service requirement of the rule. If a passenger did not provide this notice, the transit provider would still need to make its best efforts to provide the needed assistance.

It should be emphasized that the regulation does not require a general change in a provider's basic mode of service from curb-to-curb service to door-to-door service. It should also be emphasized that transit providers are not required to take actions to accommodate an individual passenger's needs that would fundamentally alter the nature of the service or create undue burdens. In this respect, the Department interprets the scope of transit providers' origin to destination service obligation analogously to the general obligations of public entities under the ADA to provide program accessibility.

For example, the Department does not view transit providers' obligations as extending to the provision of personal services. Drivers would not have to provide services that exceed "door-to-door" service (e.g., go beyond the doorway into a building to assist a passenger). Nor would drivers, for lengthy periods of time, have to leave their vehicles unattended or lose the ability to keep their vehicles under visual observation, or take actions that would be clearly unsafe (e.g., back a vehicle down a narrow alley in specific circumstances that would present a direct threat to safety). These activities would come under the heading of "fundamental alteration" or "undue burden."

Under the ADA rule, it is not appropriate for a paratransit provider to establish an inflexible policy that refuses to provide service to eligible passengers beyond the curb in all circumstances. On an individual, case-by-case basis, paratransit providers are obliged to provide an enhancement to service when it is needed and appropriate to meet the origin-to-destination service requirement. We recognize that making individual, case-by-judgments may require additional effort, but this effort is necessary to ensure that the origin-to-destination requirement is met.

This guidance has been approved through the Department of Transportation's Disability Law Coordinating Council as representing the official views of the Department on this matter.

# **INSTALLATION INSTRUCTIONS FOR 9' FLAT-AD BUS STOP SHELTERS**

**TOLAR MANUFACTURING COMPANY INC  
258 MARIAH CIRCLE CORONA, CA 92879**

## **INSTALLATION INSTRUCTIONS FOR**

**9' FLAT-AD BUS STOP SHELTER WITH  
PERFORATED METAL PANELS**

**OPTIONAL FEATURES:  
BENCH & TRASH RECEPTACLE**



### 4.3.4 Kwik Bolt TZ Expansion Anchor

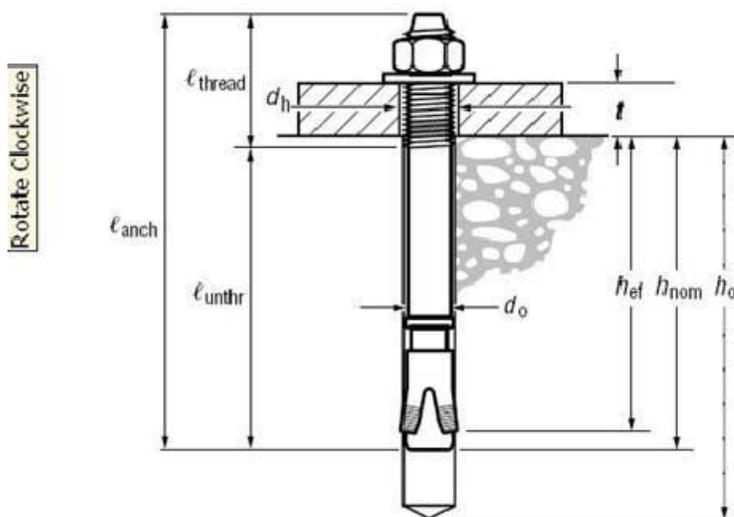
#### 4.3.4.3 Technical Data

Table 1 — Kwik Bolt TZ Specification Table

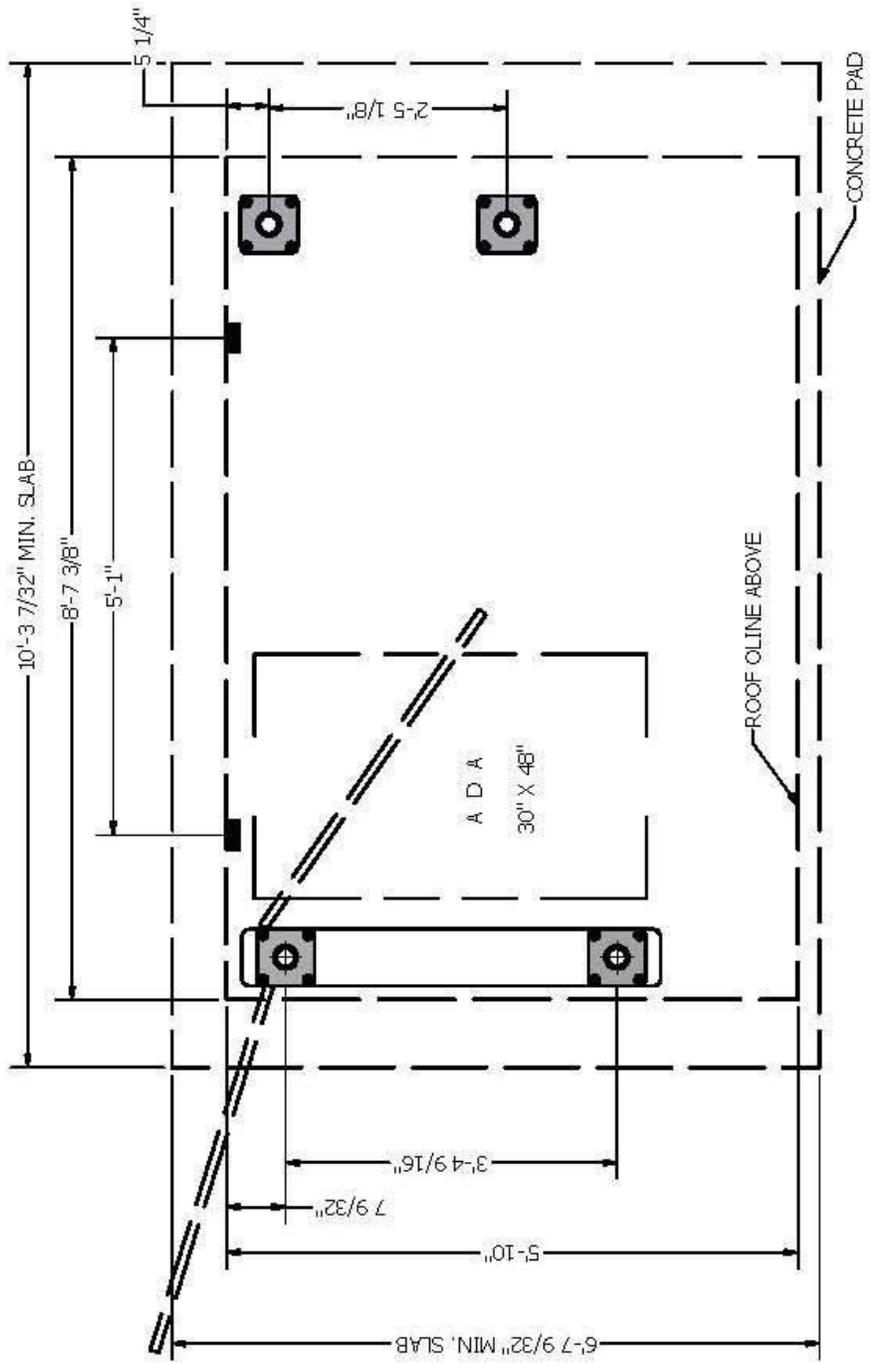
SETTING INFORMATION	Symbol	Units	Nominal anchor diameter (in.)													
			3/8		1/2		5/8		3/4							
Anchor O.D.	$d_o$	In. (mm)	0.375 (9.5)		0.5 (12.7)		0.625 (15.9)		0.75 (19.1)							
Nominal bit diameter	$d_{bit}$	In.	3/8		1/2		5/8		3/4							
Effective min. embedment	$h_{ef}$	In. (mm)	2 (51)		2 (51)		3-1/4 (83)		3-1/8 (79)							
Min. hole depth	$h_o$	In. (mm)	2-5/8 (67)		2-5/8 (67)		4 (102)		3-3/4 (95)							
Min. thickness of fixture <sup>1</sup>	$t_{min}$	In. (mm)	1/4 (6)		3/4 (19)		1/4 (6)		3/8 (9)							
Max. thickness of fixture	$t_{max}$	In. (mm)	2-1/4 (57)		4 (101)		2-3/4 (70)		5-5/8 (143)							
Installation torque	$T_{inst}$	ft-lb (Nm)	25 (34)		40 (54)		60 (81)		110 (149)							
Min. dia. of hole in fixture	$d_h$	In. (mm)	7/16 (11.1)		9/16 (14.3)		11/16 (17.5)		13/16 (20.6)							
Available anchor lengths	$\ell_{anch}$	In. (mm)	3 (76)	3-3/4 (95)	5 (127)	3-3/4 (95)	4-1/2 (114)	5-1/2 (140)	7 (178)	4-3/4 (121)	6 (152)	8-1/2 (216)	10 (254)	5-1/2 (140)	8 (203)	10 (254)
Threaded length including dog point	$\ell_{thread}$	In. (mm)	7/8 (22)	1-5/8 (41)	2-7/8 (73)	1-5/8 (41)	2-3/8 (60)	3-3/8 (86)	4-7/8 (125)	1-1/2 (38)	2-3/4 (70)	5-1/4 (133)	6-3/4 (171)	1-1/2 (38)	4 (102)	6 (152)
Unthreaded length	$\ell_{unthr}$	In. (mm)	2-1/8 (54)		2-1/8 (54)		3-1/4 (83)		4 (102)		4 (102)		4 (102)		4 (102)	
Installation embedment	$h_{nom}$	In. (mm)	2-1/4 (57)		2-3/8 (60)		3-5/8 (92)		3-5/8 (92)		4-1/2 (114)		4-3/8 (111)		5-3/8 (137)	

<sup>1</sup> The minimum thickness of the fastened part is based on use of the anchor at minimum embedment and is controlled by the length of thread. If a thinner fastening thickness is required, increase the anchor embedment to suit.

Figure 1 — Kwik Bolt TZ installed







**ROOF PLAN VIEW BELOW ROOF PANELS AND BOWS**

## **ROOF PANEL INSTALLATION**

### **ROOF PANEL:**

Place the lexan panel over the bows of the roof. Install the edges into the front and rear grooves as shown in Fig. 1 on page 6. There should be a slight gap (1/2" MAX.) in between the lexan roof panel (2 per roof).

### **PRESSURE BANDS:**

Place the pressure bands with the two rubber bulb seals over the center roof bow, see Fig. 2 on page 7. There can be a slight gap at either end. Use six TEK screws, #14 x 1-1/2, to secure the pressure band to the roof bow. The TEK screw is self-drilling and tapping. A 3/8" nut driver with suitable power tool should be used.

### **PROCEDURE:**

1. Install center screws first-be sure band is centered.
2. Install next screws down.
3. Press band down and install bottom screws.

### **END BANDS:**

Slip the rubber J-channel over one edge of the curved 3" wide band. This band is used at each end of the roof. The edge of the band without the J-channel, will be aligned to the outer edge of the last bow, and on top of the 1/4" square bead, see Fig. 3 on page 8. Use six TEK screws for each of the end bands.

### **PROCEDURE:**

1. Place the end band over the outer roof bow. Install the center screws first, and verify that the end band is centered.
2. Install next screws down.
3. Push the end band down and install the bottom screws.

BEFORE REMOVING PROTECTIVE FILMS FROM LEXAN PANEL DETERMINE WHICH SURFACE IS TO BE EXPOSED TO THE OUTSIDE

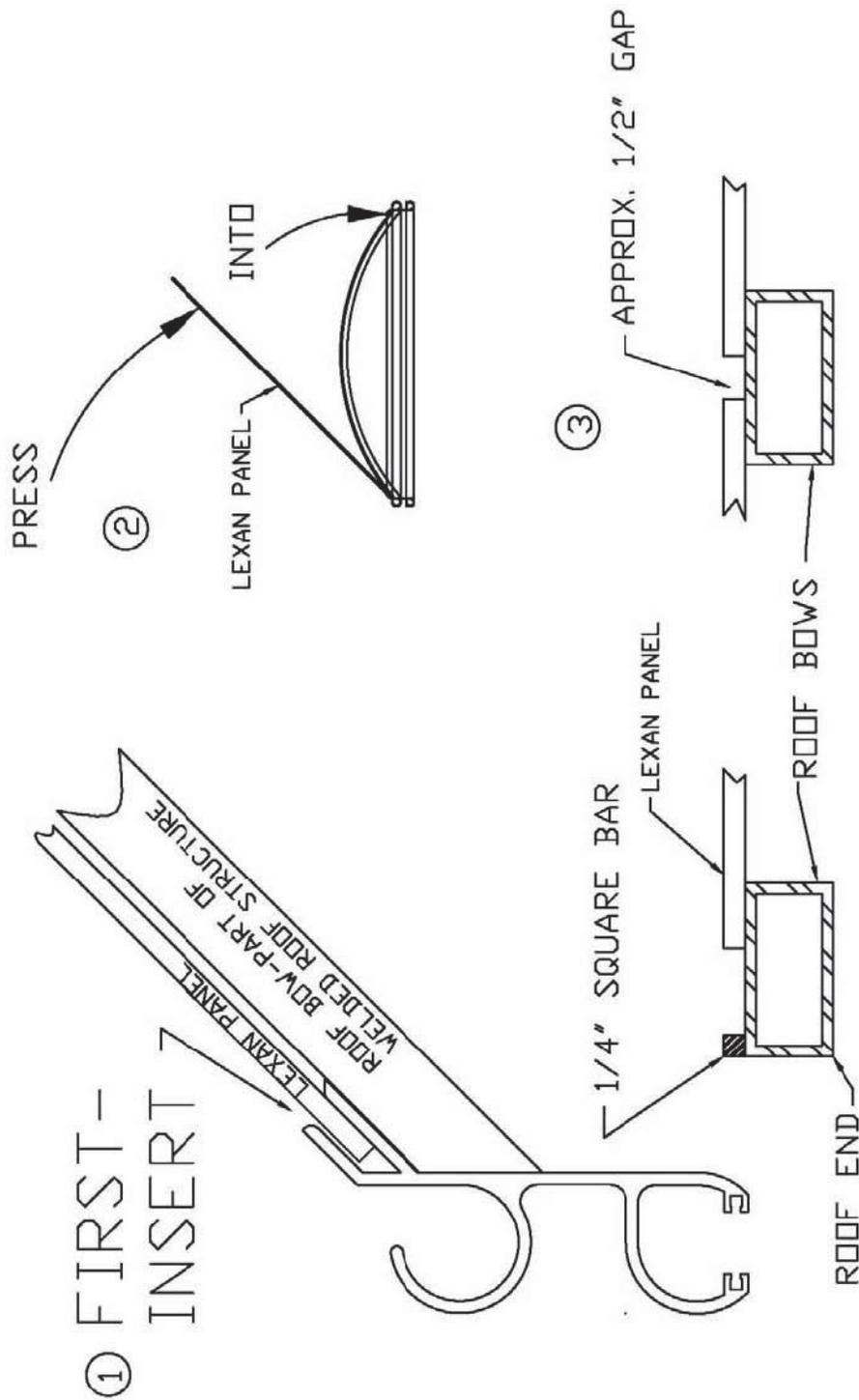
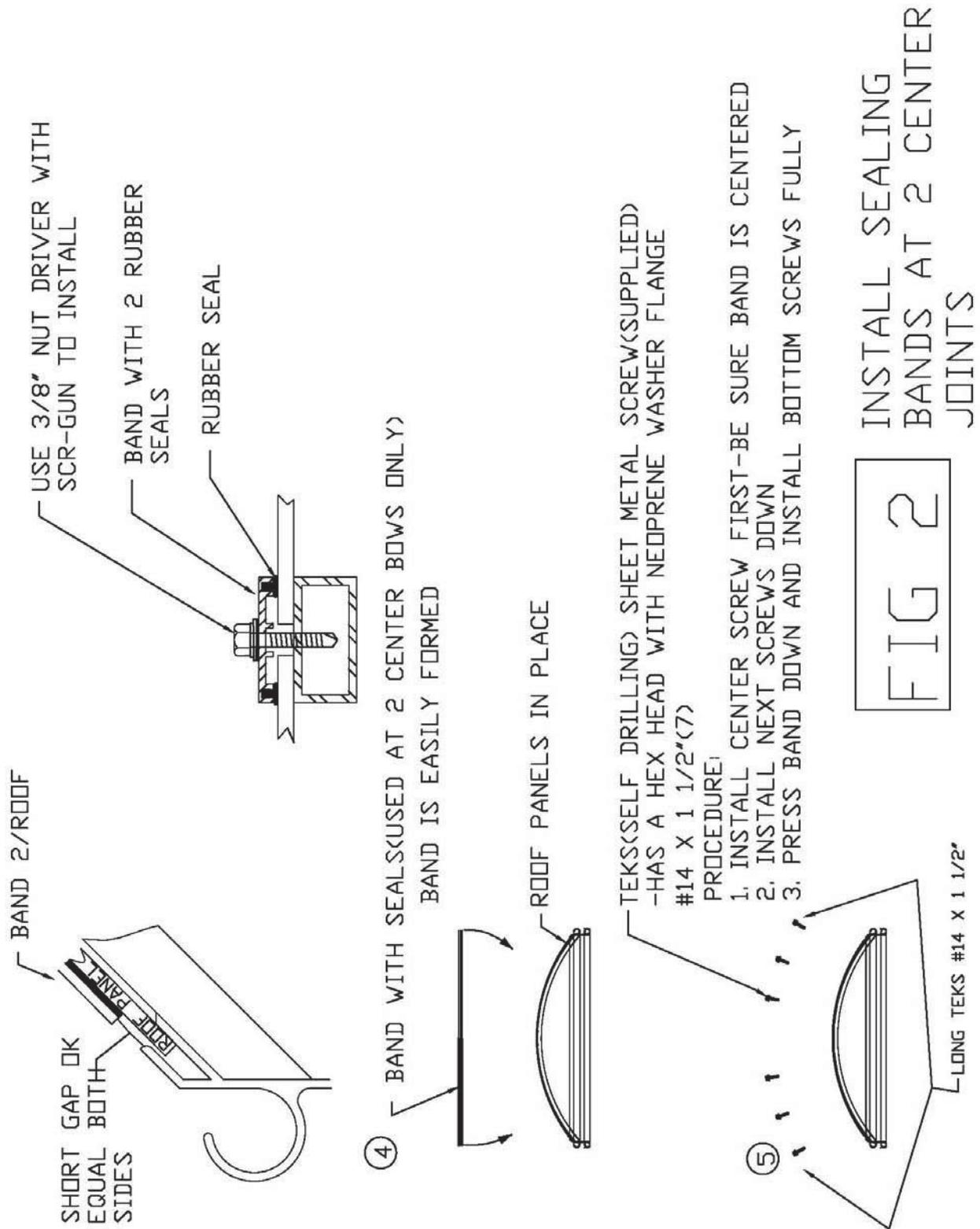
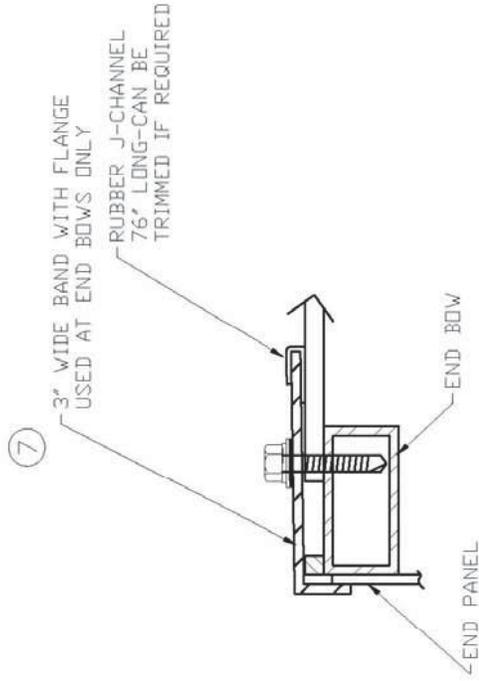


FIG 1

file: Installations, Plots/FIG1CS





⑥  
 TEKS (SELF DRILLING) SHEET METAL SCREW (SUPPLIED)  
 -HAS A HEX HEAD WITH NEOPRENE WASHER FLANGE  
 #14 X 1 1/2" (7)

PROCEDURE:

1. INSTALL CENTER SCREW FIRST—BE SURE BAND IS CENTERED
2. INSTALL NEXT SCREWS DOWN
3. PRESS BAND DOWN AND INSTALL BOTTOM SCREWS FULLY

LONG TEKS #14 X 1 1/2"

LEXAN PANELS IN PLACE

LONG TEKS #14 X 1 1/2"

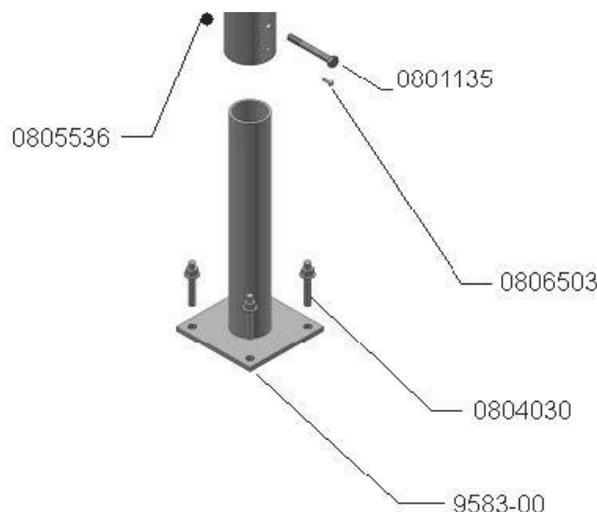
INSTALL BANDS  
 AT ROOF ENDS

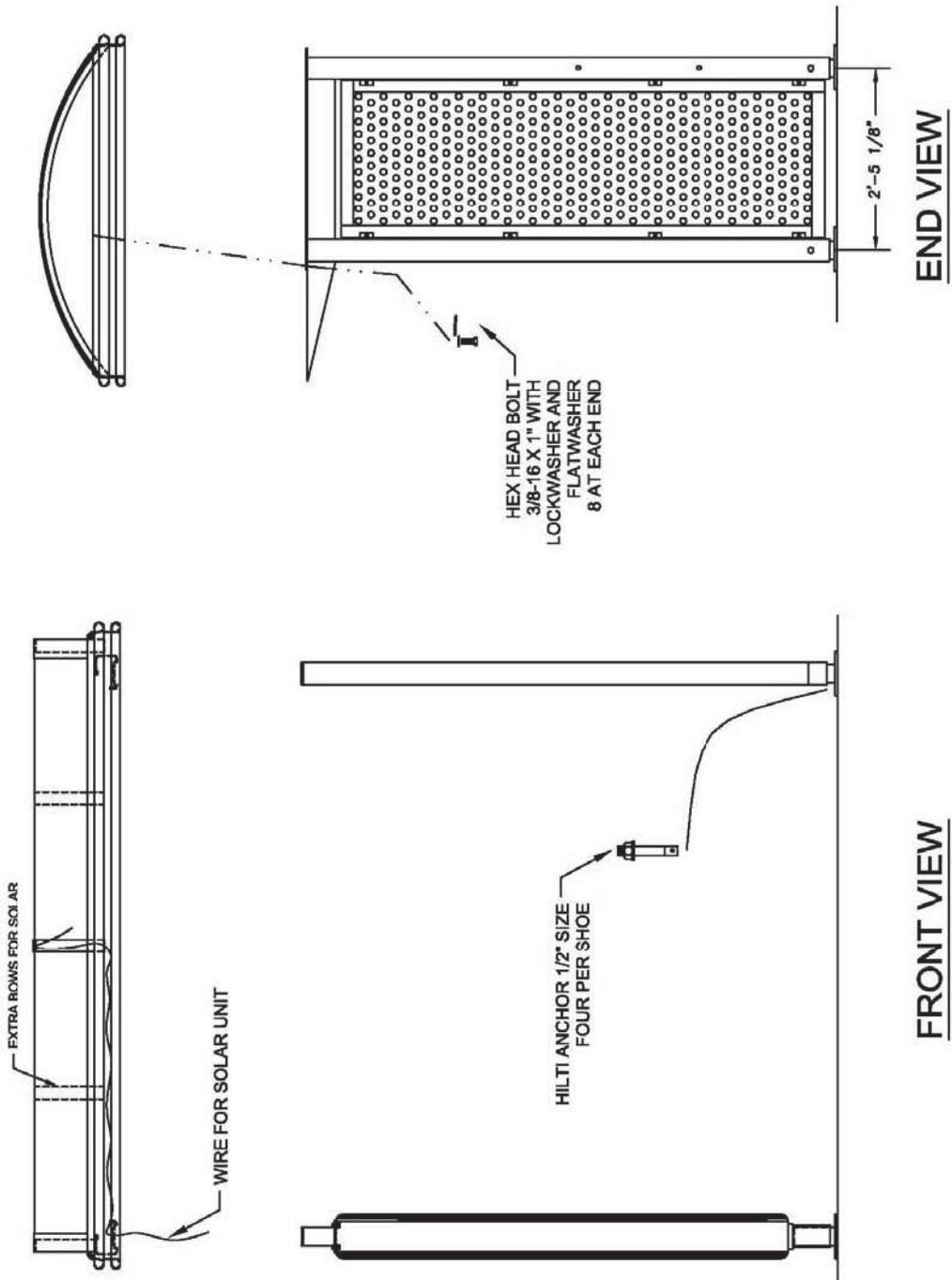
FIG 3

## ROOF INSTALLATION

### SEE PAGES 10

1. Slide two 18" long shoes into the dual support post and two 6 1/2" shoes into the flat ad box. Use the floor plan on page 4 and the elevation drawing on page 3 to position the dual post and ad box.
2. Raise the roof (weight-175 pounds) with the rear screen insertion groove at the back and position the post and ad box under the roof crossbeams. The roof should overhang the dual post assemblies more toward the street.
3. Insert and tighten four (4) each 3/8-16 x 1" hex head bolts, 3/8" lock washers and 3/8" flat washers at the top of the dual post assembly and the ad box.
4. Level the roof by placing a carpenter's level on the roof's gutter. The roof height can be increased if desired. Drill a  $\varnothing$  1/2" hole completely through the shoe. Install and tighten the 1/2-13 x 4" hex head bolt at each post. Use the self-locking hex nut to secure. The small  $\varnothing$  1/4" may be used initially to level the roof. Drill a  $\varnothing$  .221" (#2) hole through the shoe. Hammer in a drive screw #14 x 3/4" long completely through the shoe. Although it is not required that this drive screw be used, it may be beneficial during installation.
5. Plumb the dual post assembly. The centerline measurement between each post is 29-1/8". The inside measurement is 25-5/8". Check this dimension at the pipe bottom before tightening the anchors.
6. Refer to Anchoring Spec Sheet for anchoring instructions.

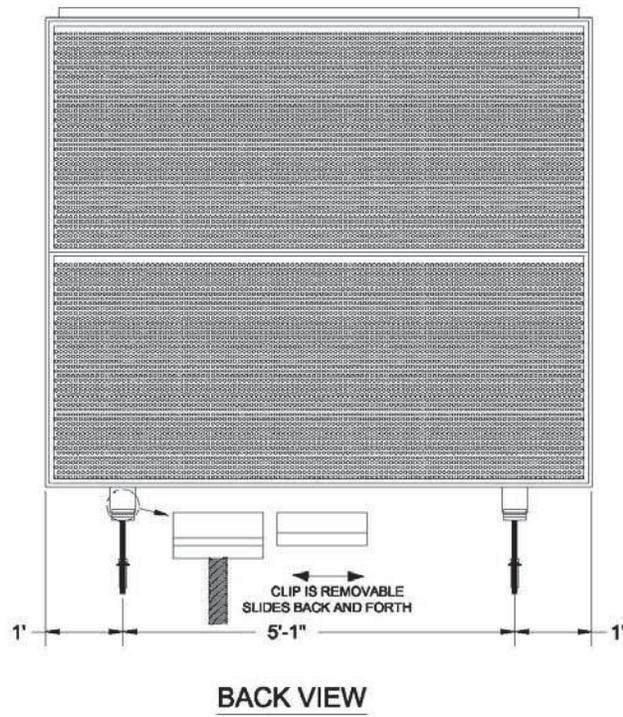
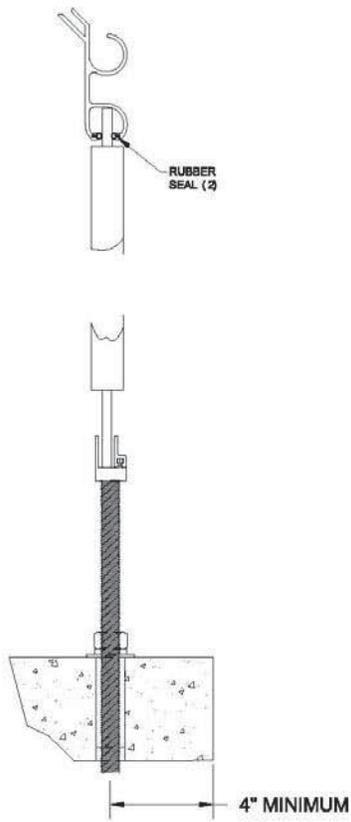
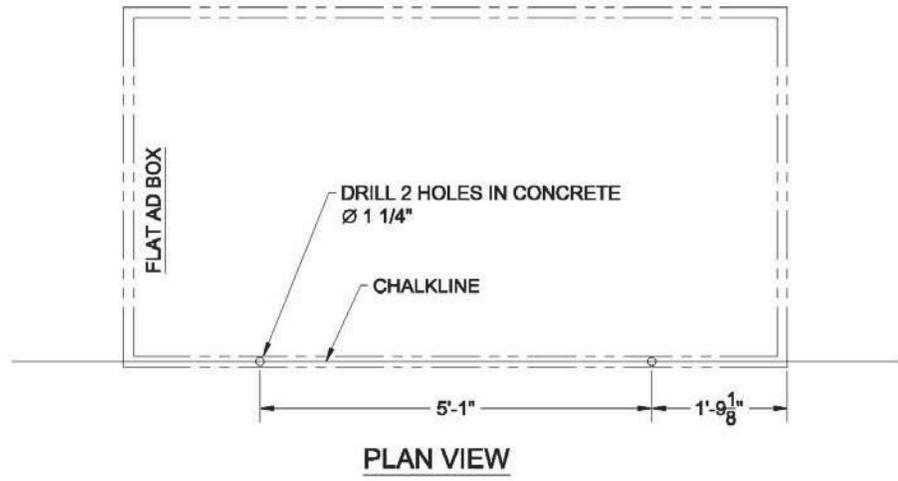




**ROOF INSTALLATION**

## **REAR SCREEN INSTALLATION SEE PAGES 2 & 12**

- 1. Drop a plumb line from the rear screen insertion groove of the roof perimeter. Mark the concrete near both ends of the roof and snap a chalk line. The rear screen support/anchor assemblies will be inserted on this line. Mark the chalk line at the intervals shown on PAGE 12. These marks will be the proper spacing for the support/anchor assemblies.**
- 2. Drill two (2)  $\varnothing$  1-1/4" holes into the concrete on the marks with a masonry drill. These holes should be at least 8" deep and may penetrate into the grade below the concrete. This depth is required to allow clearance for the threaded adjusting rod. Clean out holes.**
- 3. Place the bottom screen support/anchor assemblies into the holes. The top surface of the anchor itself should be flush to concrete or 1/2" below. The total height of the screen is 79-1/8". Measure from inside the screen insertion groove to the screen support anchor. Rotate the threaded rod inside the anchor to adjust height. Tighten the 3/4-10 hex nut to expand and secure anchor. Slide screen up into screen insertion groove and onto bottom screen support/anchor assemblies (separate the clips, it can slide off), then replace the clips.**



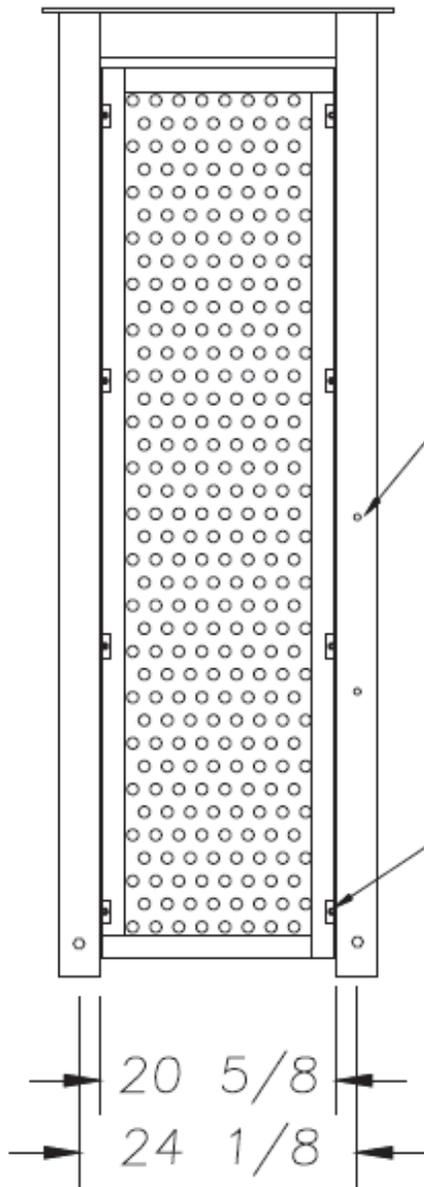
### END SCREEN INSTALLATION

NOTES:

1. SCREEN CAN BE INSTALLED OUTSIDE OF TABS ON PIPE OR INSIDE OF TABS.

2. LOOSEN THE ANCHORS AT BOTTOM TO ALLOW FITTING OF SCREEN.

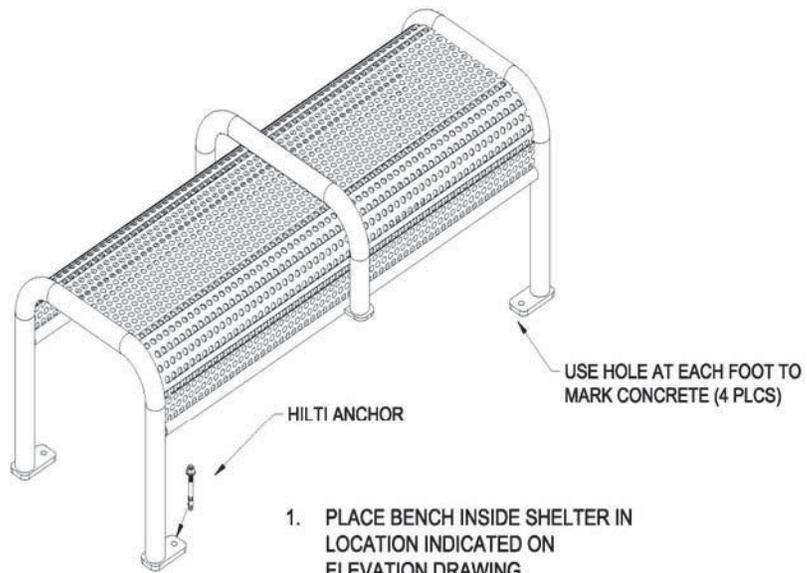
3. INSTALL THE TAMPERPROOF SCREW THROUGH THE SCREEN FRAME FIRST THEN THROUGH THE TAB.



TRASH RECEPTACLE MOUNTING HOLES SHOULD BE LOCATED TOWARD BACK OF SHELTER

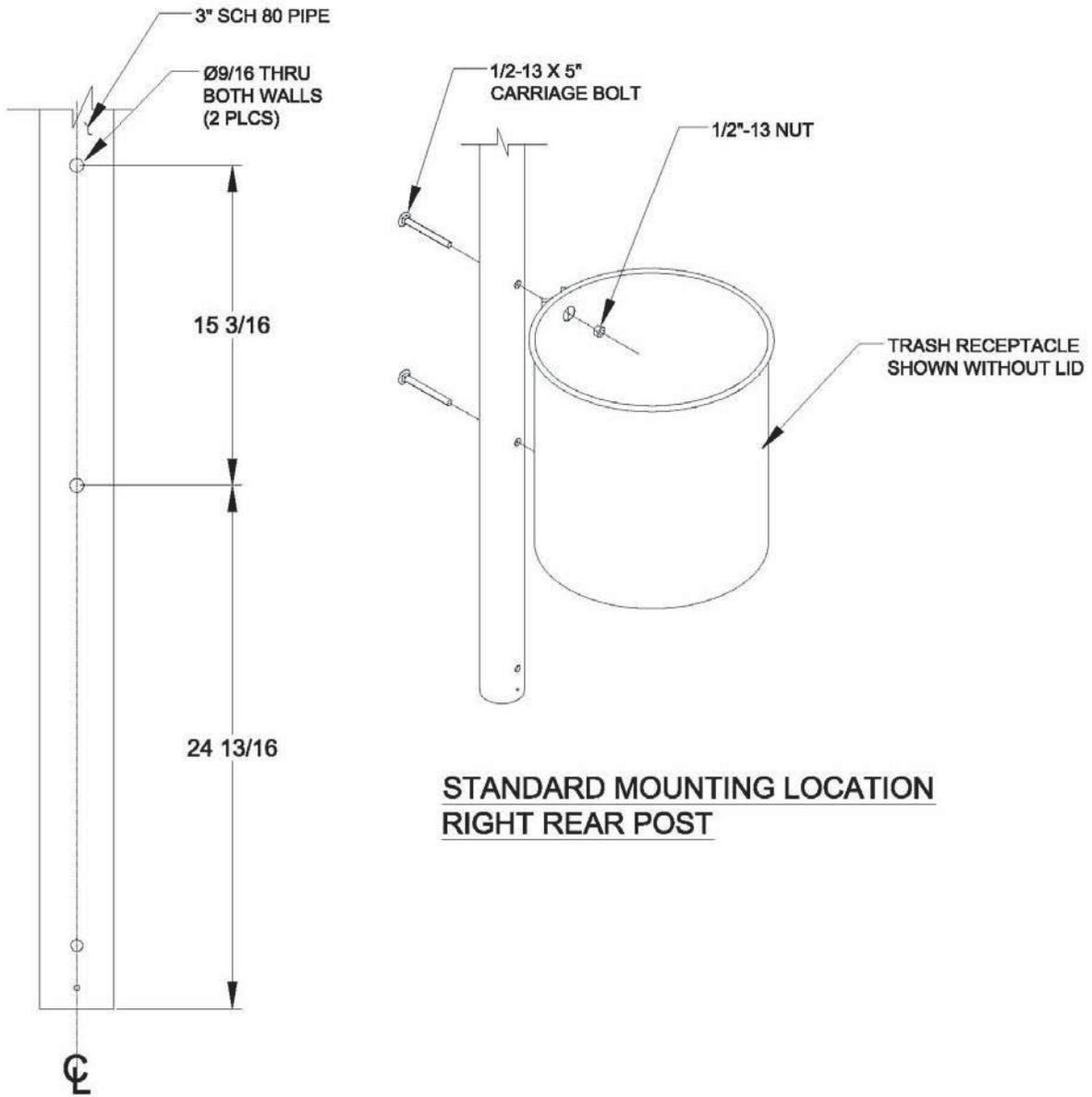
INSTALL WITH EIGHT SCREWS 1/4-20 X 1 AND SELFLOCK NUT- USE FLATWASHER AGAINST SLOTTED HOLE.

## **BENCH INSTALLATION**



1. PLACE BENCH INSIDE SHELTER IN LOCATION INDICATED ON ELEVATION DRAWING.
2. MARK THE CONCRETE AT EACH OF THE MOUNTING REFER TO ANCHORING SPEC SHEET FOR ANCHORING INSTRUCTIONS.

### TRASH CAN INSTALLATION



## GLOSSARY OF TERMS

**Accessible**

A site, building, facility, or portion thereof that complies with this part.

**Accessory Pad**

A concrete slab or paved area that is provided for bus patrons and may contain a bench, shelter, and/or other transit amenities.

**Alight(ing)**

Exiting a bus

**Americans with Disabilities Act (ADA)**

A civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life, including jobs, schools, transportation, and all public and private places that are open to the general public. The purpose of the law is to make sure that people with disabilities have the same rights and opportunities as everyone else.

**Board(ing)**

Entering the bus

**Bus Pad**

A concrete pad constructed in the street, adjacent to the bus stop zone that accommodates the weight of a bus.

**Bus Stop**

A place on a bus route, usually marked by a sign, at which buses stop for passengers to alight and board.

**Bus Bay**

A dedicated stopping area for buses that is recessed outside of the travel lane that is used for passengers to board and alight. Also known as a bus turnout.

**Curb Ramp**

A combined ramp and landing constructed to allow persons with disabilities and wheelchairs to travel from the sidewalk to street level.

**Definition of Disability:**

Under California State law, Government Code Section 12926, a person with a disability is: 1) A person having a physical or mental impairment that limits a major life activity. This limitation must be considered in the unmitigated status. This means that the determination of whether the limitation exists would be considered in terms of how the individual would function without the use of medication, personal devices or habits that have been formed to mitigate the disability. 2). or, A person who has a record of a disability, such as described in number one. 3). or, a person who is regarded as having a disability, such as described in number one.

**Note:** This is an abridged definition of disability under California State law. For further information, please see California Government Code 12926. The California definition of disability is being used, as it is more stringent than the definition found under the Americans with Disabilities Act of 1990 or the Americans with Disabilities Amendments Act of 2008.

**Off-street Facility**

A transit stop that is located outside of the public right-of-way, typically within a parking lot or other designated area.

**On-street Facility**

A transit stop that is located directly within or adjacent to the travel way.

**Public Right-of-Way**

Public land or property, usually in interconnected corridors, that is acquired for or devoted to transportation purposes.

**Shelter**

A transit amenity that includes a covered passenger waiting area, often semi-enclosed with benches, that provides protection from the elements (weather).

**Transit Amenity**

A feature of a transit stop that enhances a rider's transit experience which can include a shelter, bench, trash receptacle, or bike rack, etc.

**Transit Center**

A major transit hub where several transit routes converge and can also include the interchange between varying modes of transportation (walking, biking, and motor vehicles).

**Transit Facility**

A designated location along a transit route where a transit vehicle stops for passengers to board and alight and includes bus route identification signs, wheelchair landing pad, lighting and other transit amenities.

**Qualified Person with a Disability:**

A qualified person with a disability has a disability as described above and is qualified to receive the programs, services or activities of the entity in question.

**Wheelchair Landing Pad**

Paved area or sidewalk that allows for the extension of a wheelchair lift and safe boarding and alighting, or a person in a wheelchair. A 5-ft by 8-ft concrete pad required at all new or renovation bus/transit stops.

Source: Transit Authority of River City, *Transit Design Standards Manual: A Reference Guide*, September 2013.

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