



## **BUS STOPS GUIDELINES**

**July 2010 Revision**



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## Executive Summary

The public's first impression of TriMet and its services is the bus stop. It is important that bus stops are easily identifiable, safe, accessible, and a comfortable place to wait for the bus. Although, there will always be underdeveloped bus stops that do not achieve the safety and accessibility standards outlined in the following pages, these guidelines provide a framework for maintaining and developing bus stops. They promote consistency for good design and the provision of bus stop amenities, making stops easier to identify and better matched to their use, location and potential for attracting riders. Through a series of development programs, TriMet seeks to make bus stops a positive contribution to the community streetscape and a place where riders can obtain transit related information and are encouraged to use the provided services.

The guidelines identify and encourage partnerships with the community and property owners. TriMet is working with communities to improve access to bus stops, including sidewalks, safe street crossings, accessible curb ramps and bicycle lanes. The quality of the streetscape is critical to the success of the bus stop development program.

The purpose of this document is to:

- 1) Identify the elements of the TriMet bus stop,
- 2) Set guidelines for the design of bus stops and the placement of bus stop amenities, and
- 3) Describe the process for managing and developing bus stops at TriMet.

This document will also act as the basis for Capital Improvement Plan development to justify and support project goals.

The Bus Stops Guidelines document contains four major sections, each of which is summarized below.

- **Introduction:** This section looks at the various goals that govern the development and implementation of bus stop projects within TriMet. The section also provides a snapshot of the current on-street inventory throughout the system and looks at some of the challenges that TriMet are being faced with. The section concludes by identifying the short and long term goals of the Bus Stops Section.
- **The Bus Stop:** This section looks at the guidelines maintained by TriMet to maximize the effectiveness of its bus service. This section defines preferred designs for bus stop location, layout, amenities and applying transit-preferential street treatments.
- **Program Partnerships:** Bus stops as public spaces are as much a part of a community as streets, pathways, parks and plazas. This section explores ways in which TriMet encourages jurisdictions, neighborhood associations and citizens to recognize the value bus stops play in the community and looks for ways to build partnerships with these entities to enhance bus stops.
- **Bus Stop Development Projects:** TriMet initiates capital projects to make significant improvements to route efficiency, on-street and bus stop safety, accessibility and comfort. This section describes some projects TriMet is currently implementing, which provide and / or improve amenities within existing transit services.



# Bus Stops Guidelines

## I. Introduction

The public's first impression of TriMet and its services is the bus stop. It is important that bus stops are easily identifiable, safe, accessible, and a comfortable place to wait for the bus. These guidelines provide a framework for maintaining and developing bus stops. They promote consistency for good design and the provision of bus stop amenities, making stops easier to identify and better matched to their use, location and potential for attracting riders. Through a series of development programs, TriMet seeks to make bus stops a positive contribution to the community streetscape and a place where riders can obtain transit related information and are encouraged to use the provided services. The guidelines identify and encourage partnerships with the community and property owners. TriMet is working with communities to improve access to bus stops, including sidewalks, safe street crossings, accessible curb ramps and bicycle lanes. The quality of the streetscape is critical to the success of the bus stop development program.

The purpose of this document is threefold: 1) to identify the elements of the TriMet bus stop, 2) to set guidelines for the design of bus stops and the placement of bus stop amenities, and 3) to describe the process for managing and developing bus stops at TriMet. Through explanations and diagrams, this document provides the tools needed to plan bus stops and associated amenities within the TriMet service area.

### Bus Stops Program Goals:

- A *basic bus stop* should consist of an accessible, paved area and easily identifiable signage. Bus stop shelters and other amenities shall be provided consistent with a set of bus stop development criteria.
- Bus stops should be placed to *assure customer convenience and provide for the safety* of pedestrians and vehicles. Stops shall be visible, near crosswalks and well lit.
- Bus stops should be *clearly and consistently identifiable with up-to-date information* for riders about services at the bus stop.
- TriMet should solicit *community input* for all bus stop installations and changes, and respond promptly to inquiries and complaints from customers and bus stop neighbors.
- The design of bus stops shall be *sensitive to the community setting* and may incorporate features that identify the stop with the community (such as art, bus stop naming or inclusion of a community bulletin board).
- Where reasonable, bus stops should be *accessible*. Americans with Disabilities Act (ADA) considerations will be given top priority in the siting and design of new and existing bus stops.
- Bus stops shall *be located in support of institutions* and with clients having special needs, large employers and community centers.
- Bus stops will be spaced to *maximize the efficient operation* of transit service while not requiring riders to walk more than a quarter mile to the bus stop.
- TriMet will work with local jurisdictions, communities, and land developers to construct sidewalk connections to bus stops, advocate for safe and comfortable street crossings, and improve the overall walking environment near bus stops. Regional planning targets, new or sustained transit service and bus stop investments will be used to encourage those improvements.
- Bus stops shall be *well maintained* and free of trash and vandalism. TriMet will seek partnerships that share responsibility for maintaining bus stops.



- Damaged or worn out bus stop features shall be *repaired or replaced* in a timely manner.
- TriMet will seek to *offset the cost of installing and maintaining bus stop amenities* through a bus shelter and bus bench advertising program.

## II. Bus Stops Program Year 2010 (1) Status Report

### A. Bus Stop Statistics Snapshot

#### *General Information*

- Service Area 570 square miles
- Jurisdictions in the service area 27
- Bus Stops 7050
  - Major transit points<sup>1</sup> >150

#### *Bus Stop Elements and Amenities*

**Upgraded with New Poles & Signage<sup>2</sup>** 5147 (73% of stops)

**Bus Shelters** 1076 (15% of stops)

- Ad shelters 143 (total included in Standard Barrel vaulted number)
- Standard Barrel vaulted 990
- Downtown Mall style 40
- High Capacity 14
- Private 22
- First Series Aluminum Shelters 10

**Trash cans** 739

**Benches** 1775

- Basic (used in shelters) 969
- Premium 49
- Pole integrated (simme) 59
- Ad 728

#### **Lighting**

Hard Wired shelters (electrified) 85  
 Pole Mounted (solar LED) 23  
 Shelter Mounted (solar LED) 303

### B. Limitations

Not all TriMet bus stops are consistent with the goals listed in the preceding section. In some instances bus stops are defined by the underdeveloped corridors or roads they serve. Where roadways lack underground drainage and pedestrian systems or are constrained by natural terrain, TriMet cannot effectively improve impacted bus stops without making significant street and sidewalk enhancements, removing or reducing the number of stops or moving service. These issues may be best addressed by a coordinated effort between TriMet and the jurisdictions charged with maintaining and upgrading the roadway system.

<sup>1</sup> This includes major transit points, transit centers, and stops in the downtown transit mall.

<sup>2</sup> Currently, TriMet uses blue octagon shaped steel poles. Previously, round, 2" poles were used.

- Approximately 32% of TriMet bus stops suffer from lack of pavement or have interrupted or no sidewalk connection to a community pedestrian network. Crosswalks may be few and far between.
- Using the boarding criteria described in Section III of this document, approximately 150 eligible stops do not have shelters, though some may have other forms of shelter from buildings, bridges or awnings.
- Not all bus stops are easily identifiable due to: 1) inconsistent placement, 2) incomplete customer information on bus stop signs, 3) signs that blend into the streetscape, and/or 4) one-sided signs.
- Only those bus stops that have a trash can and/or shelter are cleaned on a regular basis.

Bus stop inconsistencies, as measured against the guidelines contained in this report, will be identified and mapped and will be the basis for development of a capital improvement program that can be directly considered as part of the annual capital budget development process. The existing bus stop management database with its detailed bus stop descriptions together with boarding counts from the Bus Dispatch System (BDS) will facilitate identification of bus stop specific inconsistencies. TriMet will also be working with Metro and jurisdictions to identify deficiencies in the pedestrian network that make it difficult and unsafe to access bus stops. Intergovernmental agreements must be developed to promote joint development of bus stops and the pedestrian network.

### C. Priorities

The following are bus stop management priorities, which are either reflected in current programs or anticipated in future programs:

- Improve underdeveloped stops where 1) supporting infrastructure exists, 2) it is physically feasible, and 3) it is fiscally responsible. Improvements start with pavement and access upgrades, followed by shelters and other customer amenities.
- Improve customer information through expansion of existing methods and implementation of innovative new methods. Examples include shelter and pole-mounted printed information and electronic real-time (Transit Tracker) displays.
- Replace all bus stop signage with signs that are readily distinguished, even in active streetscapes, and to be equally identified from both directions. Locate bus stops, signs and amenities consistent with guidelines and equitably among all communities served by TriMet.
- Evaluate all sites for bus stop amenities placement. Place shelters where it is feasible, where existing protection is unavailable (i.e., no awnings, etc.), and according to TriMet guidelines.
- Work with jurisdictions to identify deficiencies in the pedestrian network. Establish priorities based on pedestrian safety and existing and potential transit use. Develop strategies to work with property owners to improve the pedestrian connectivity to bus stops, where viable.
- Pursue agreements with jurisdictions and public utility agencies to facilitate placement of shelters, benches, lighting and trashcans.
- Find revenue-generating opportunities through the use of ad shelters, ad benches, and similar programs.
- Maintain and expand public outreach programs and find more effective ways to solicit process and respond to community and customer input.
- Improve operating efficiencies through bus stop spacing that is consistent with these guidelines.

### III. The Bus Stop

It is impossible to force every bus stop to conform to a standard. However, TriMet maintains guidelines to maximize the effectiveness of its bus service. These guidelines define preferred designs for bus stop location, layout, amenities and applying transit-preferential street treatments. The most important of many considerations are listed in this document.

#### A. Stop Location and Spacing (New Stops, Moves and Consolidations)

##### *Approach*

Stop location and spacing will always depend on individual circumstances. However, one must weigh the options and choose based on well-understood criteria. Generally TriMet expects riders to walk up to a quarter-mile to reach the stop.

When determining new bus stop locations proceed as if placing stops for the first time. If an existing stop does not fit into the process listed below, there must be a very compelling reason to retain it (e.g., if significant investment has already been made at the stop, or if there is heavy use by riders who are elderly or disabled *and* a new location would clearly degrade service for those riders). A stop should remain in service as designed for at least 5-10 years.

##### *Tools*

Choices for stop location will determine access to: pedestrian crossings; transfer lines; major transit generators; and general neighborhood employment and activity areas.

##### *Preferences*

Preferred bus stop locations are determined in the following sequence:

- *Transfer Locations:* All intersections with other bus lines, MAX (light rail), Streetcar, and WES.
- *Designated Crossings:* Stops at signalized intersections with safe pedestrian crossings (aim for spacing of 780 feet).
- *Other Major Stops:* Major transit trip generators (at closest intersection with crosswalk, where available. Midblock crossings are less desirable and should be considered when preferred options are unavailable.)
- Locations based on stop spacing:
  - *Dense areas* (22 or more units/acre): Aim for 3 blocks/780 feet. Less than that is only appropriate in special circumstances on a stop-by-stop basis or for safety. For non-residential or employment areas use an equivalent 56 persons/acre. Included in “dense areas” should be regional designated centers: Regional Centers, Town Centers, and Main Streets.

##### *How to determine levels of density*

1. The standards must be adjusted to account for the difference between net and gross acreage. Taking an average of 25% of gross acreage used for such things as right-of-way (calculated for three representative neighborhoods in Portland – Lents, Arbor Lodge, and Multnomah), 22 units/acre becomes approximately 16 units/total acre (including right-of-way).
2. Mixed use, commercial and industrial areas should also be included by using a conversion to identify the number of people per acre (employees for employment areas and residents for residential areas). Using an average of just over 2.5 persons per household (1990-97 average – Metro data), this means:
  - Dense areas = 41 or more persons/acre
  - Medium to low density = 8 to 41 persons/acre
  - Low to rural density = less than 8 persons/acre
3. Future growth needs to be accounted for as well, and can be determined by looking at zoning and regional growth projections.

For more information, please contact Metro.



- *Medium to low density areas* (4 to 22 units/acre): 4 blocks/1,000 feet. Less than that only for special circumstances on stop-by-stop basis or for safety.
- *Low to rural density areas* (below 4 units/acre or 10 persons/acre): As needed based on above considerations. No more frequent than every 1,000 feet.

Bus stop spacing will continue to be governed by a combination of density and subjective issues such as neighborhood demographics, available alternatives, safety, public input and efficient bus operations. It is intended that this process be objective, but also flexible enough to respond to unique needs and circumstances.

As programs or requests for bus stop changes call for the review of specific bus stops, these spacing criteria will be considered. Even key bus stops may require adjustment (e.g., nearside to farside placement). Long term user and operating benefits will be weighed against project costs and neighborhood/rider objections to proposed changes.

Pages 6 and 7 show examples of stop locations for areas of dense development and areas of lower density development.

### *Considerations*

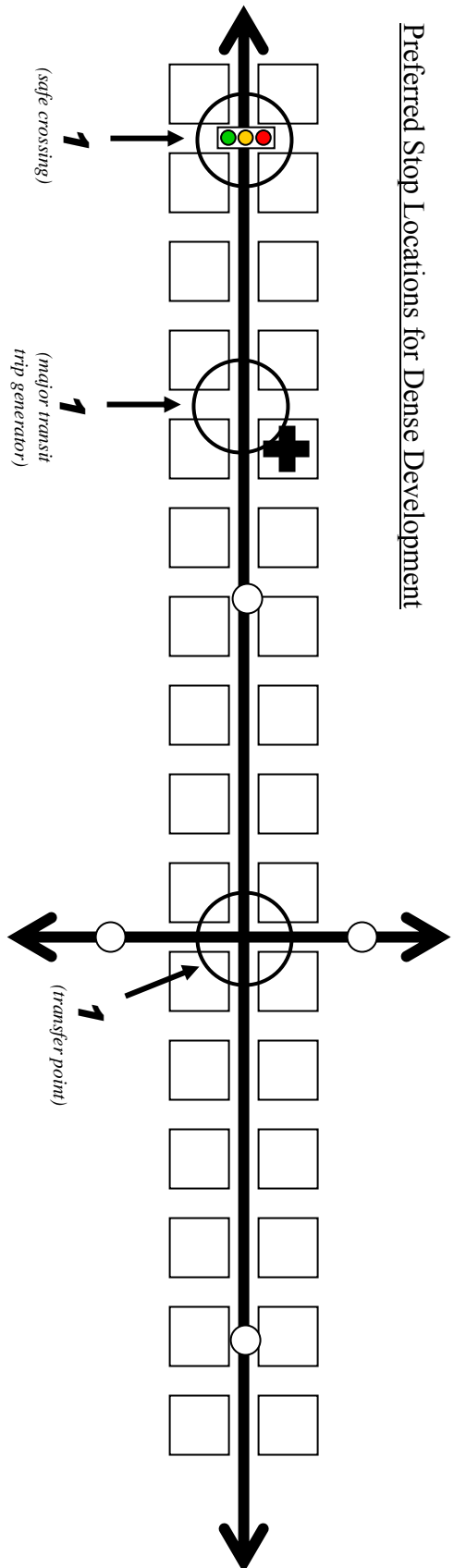
The following is a checklist of the most important considerations:

- ❑ Safety
  - Waiting, boarding and alighting must be safe
  - Access to a safe street crossing/crosswalk
  - Provide adequate sight distance, i.e., provide visibility between bus driver and waiting riders
  - Provide a safe location for operational movements
- ❑ Service quality tradeoffs – fewer stops mean the following:
  - Faster service
  - More potential for amenities at each stop
  - May require a longer walk from/to origin/destination
  - More ridership at existing stops
- ❑ Stops must be suitable for bus operations
  - Safe access into and out of bus stop location (no parking)
  - Provide bus operators with adequate view of street and pedestrian areas
  - Provide adequate sight distance for autos before bus stop, so drivers are aware the bus is stopped
- ❑ Possible impacts on traffic safety and traffic delay
- ❑ Input and review by the public and by neighborhood and business associations
- ❑ Pedestrian safety to and from the stop and at the bus stop
- ❑ Accessible for all
  - Minimize slope
  - If necessary, construct 5' x 8' concrete pad at stop
  - Check for curb ramps at intersection and on surrounding streets
- ❑ Maximize accessibility to neighborhood or major generators
  - Preference for intersections at streets that connect into surrounding neighborhood
  - At major transit generators, locate the stop near pedestrian access to the generator, preferably at signal
  - Look at pedestrian pathways (formal and informal), not just streets
- ❑ Stops should be paired, at same intersection when possible
- ❑ Ensure compatibility with adjacent properties
- ❑ Do not move existing stops for trash, noise, and/or nuisance. Instead, seek ways to address the problem directly.

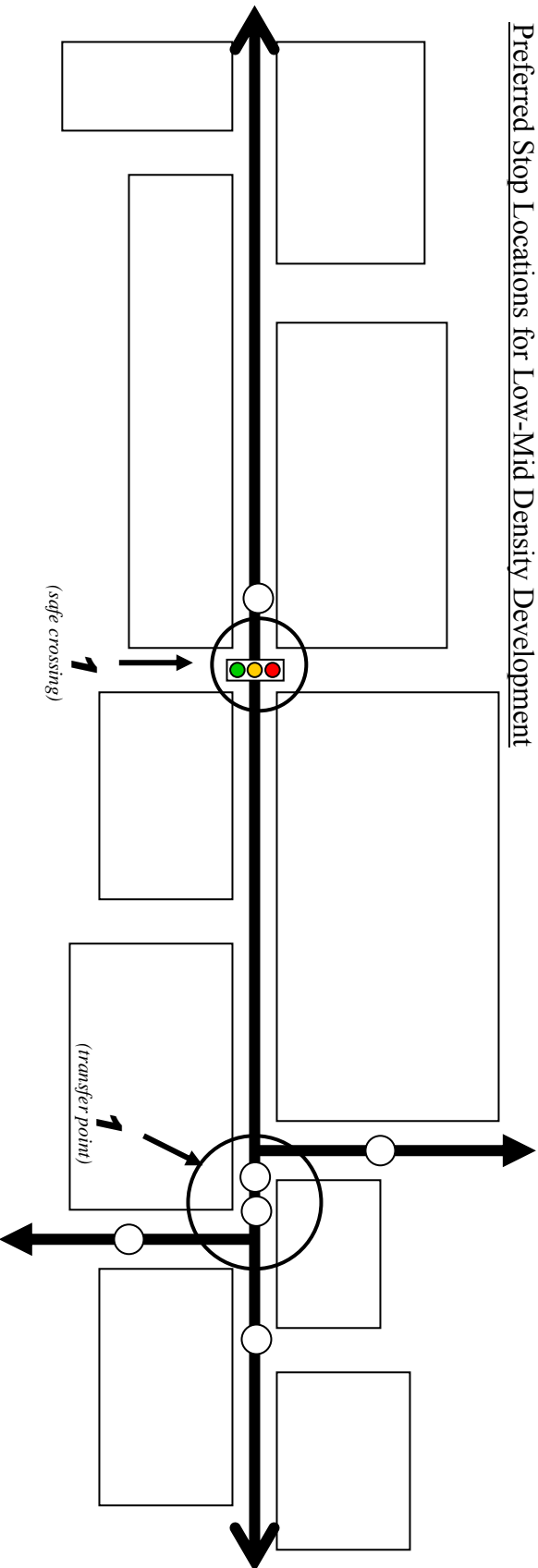
**Diagram 1**

Initially, plan stops at safe crossings, transfer points, and major transit trip generators

Preferred Stop Locations for Dense Development



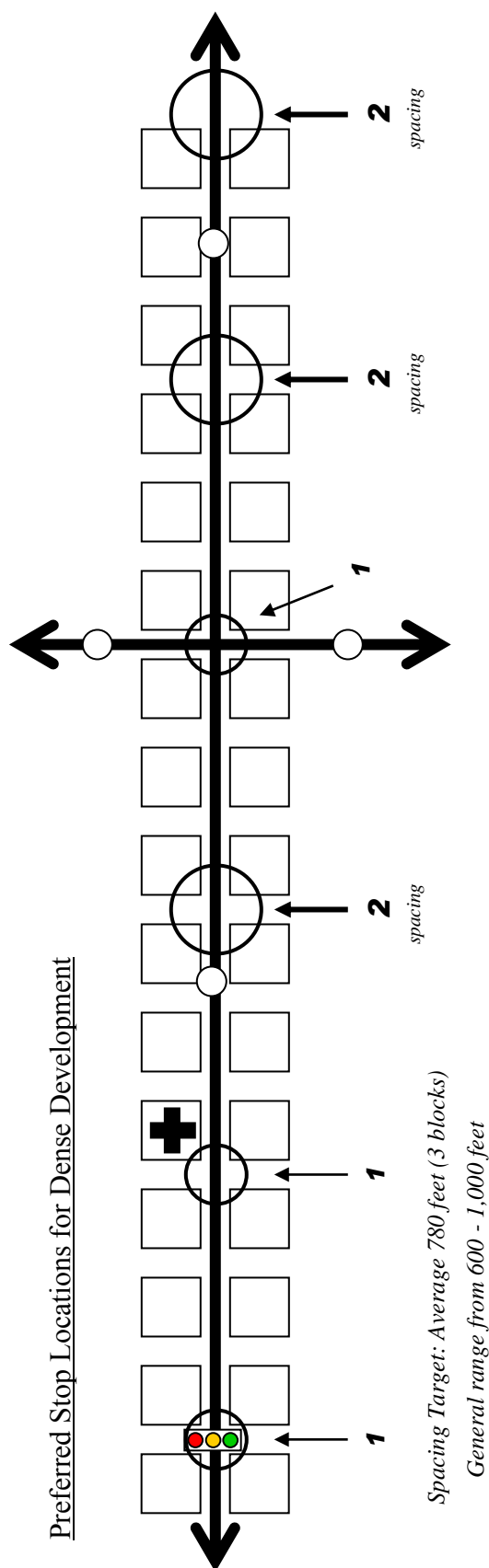
Preferred Stop Locations for Low-Mid Density Development



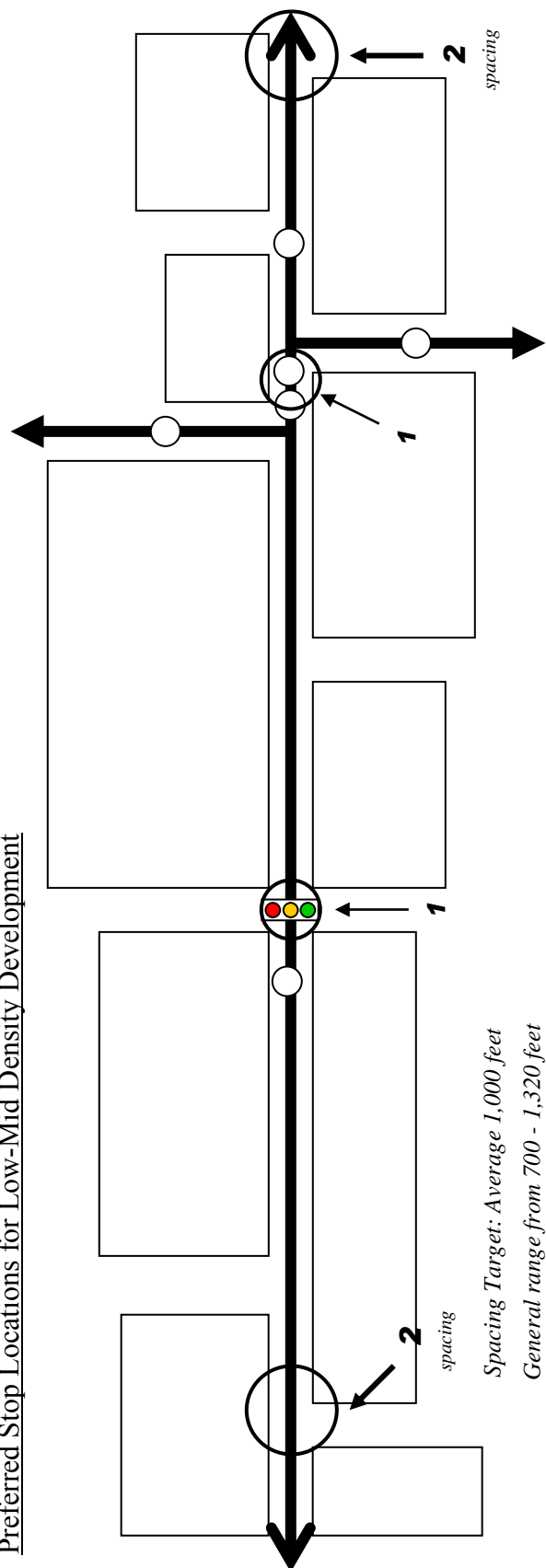
**Diagram 2**

Then plan stops at intersections that are spaced appropriately between the initial stops.

Preferred Stop Locations for Dense Development



Preferred Stop Locations for Low-Mid Density Development



## B. Stop Placement

### *Approach*

Stops are placed at locations:

- that are safe for passengers and vehicles,
- that may be easily accessed by the surrounding neighborhood, major transit generators and/or intersecting transit services, and
- where improvements in safety, convenience and/or reduced trip times outweigh negative impacts.

### *Tools*

The placement of the bus stop in relation to intersection: farside; nearside; midblock; off-street.  
Please see Attachment A.

### *Preferences*

**Table 1. Stop Placement**

<b>Situation</b>	<b>Preferred Placement</b>
Any signalized intersection where bus can stop out of travel lane	Farside
If bus turns at intersection	Farside
Intersection with many right turns	Farside
Complex intersections with multi-phase signals or dual turn lanes	Farside
If nearside curb extension prevents autos from trying to turn right in front of bus	Nearside
If two or more consecutive stops have signals	Alternate nearside and farside (starting nearside) to maximize advantage from timed signals
If obvious, heavy single-direction transfer activity	One nearside; one farside to eliminate crossing required to transfer
If blocks are too long to have all stops at intersections	Midblock*
Major transit generators not served by stops at intersections	Midblock*
Midblock pedestrian-crossing defined by refuge island and/or striping	Midblock*
Transit center	Off-street
Major transit generator that cannot be served by on-street stop, or where ridership gain will far outweigh inconvenience to passengers already on-board	Off-street

\* Midblock bus stops are generally less desirable than stops at intersections, however they must be considered when suitable nearside and farside options are unavailable.

Stops are at intersections because:

- walking distances amongst origins, destinations and stops are reduced for customers,
- street crossings are legal at intersections,
- street crossings are generally safer at intersections, and
- curb ramps and other benefits of accessibility are generally located only at intersections.

Placing stops farside of the intersection is preferred in most cases for signalized intersections because they result in:

- fewer traffic delays and better safety – bus clears intersection blocking fewer movements and sight lines,
- better pedestrian and auto sight distances,
- fewer conflicts between buses and pedestrians (i.e., no pedestrians trying to cross in front of bus – where passing autos cannot see them),
- greater bus maneuvering area,
- more effective priority signal treatments,
- eliminating the danger of cars turning right in front of buses (as happens nearside), and
- minimized parking restrictions necessary to get bus to curb (shorter bus zones because buses use the intersection as part of approach to zone).

### *Considerations*

Every site will present a unique set of issues. The following is a checklist of the most important considerations:

- ☐ Safety
  - Waiting, boarding and alighting must be safe
  - Steer riders toward safe street crossings
  - Watch for other pedestrians
  - Consider impacts on other traffic
  - Provide adequate sight distance, i.e., provide visibility for bus driver and waiting riders
- ☐ Travel time delays
  - Farside allows signal treatments to work most effectively
  - Alternate placement nearside-farside if signals occur at every stop
- ☐ Service quality tradeoffs – fewer stops mean:
  - Faster and more efficient service
  - More potential for amenities at each stop
  - Longer walk distance to stops for some
- ☐ Stops must be suitable for bus operations
- ☐ Impacts on traffic
- ☐ Accessible for all
  - Slope – no more than 2% for level surfaces, 8% for ramps
  - If necessary, construct 5' x 8' concrete pad at stop
  - Check for curb ramps at intersection and on surrounding streets
  - Direct routes and comfortable, safe walking environment to stop
- ☐ Ensure compatibility with adjacent properties

## C. Stop Elements, Amenities, and Customer Information

### *Approach*

Use elements that clearly define the bus stop for patrons, operators, pedestrians, and motorists. Provide amenities that will invite ridership by making riders comfortable and confident in the service. Do this in locations and at a level that is appropriate to the ridership and budget. Place amenities and elements of stops in configurations that maximize:

1. Safety
2. Visibility
3. Comfort

Customer information is designed to:

**Show the way** – Provide easy identification of every bus stop. This is achieved through colors, shapes and symbols that are consistent but unique within the streetscape.

**Provide basic service information** – Provide basic route information on every bus stop sign that includes the route number, direction of travel, major stops along the way and the fare zone.



**Provide expanded information at targeted stops** – Use visual and tactile tools, provide more detailed schedule information and maps at targeted stops.

### *Tools*

#### Bus stop elements:

- **Pole and bus stop sign** – *Required*, identifies the bus stop. TriMet bus stop signs are used at all district bus stops. Historically, these signs have been placed on any number of existing poles, columns, light standards and the occasional tree or bus shelter. This is a past practice that TriMet is attempting to phase out. At new or moved stops, TriMet signage is placed on dedicated TriMet poles whenever possible; other jurisdictional signage identifying the bus stop zone may also be placed upon a TriMet bus stop pole.

Poles should be placed two and a half feet from the curb with informational signs flag-mounted away from the street. Farside pole and sign placements should be a minimum of 50' clear of existing pedestrian crossings. Nearside pole and sign placements at signalized or controlled intersections should be setback 15' to 25' from pedestrian crossings. Additional allowances must be considered when posted speeds are above 30 mph. Bus stops placed at marked crossings that are not at controlled intersections must be placed in advance of the crossing (1ft per posted MPH recommended) when multiple lanes are present. Nearside pole and sign placements at uncontrolled intersections may be placed as close as one foot from an unmarked crossing. Pole placement must be carefully planned to ensure that all bus stop elements work as designed, that all bus operators know exactly where to stop, and that all patrons know exactly where to board. *Proper placement and installation is critical to bus stop operation.* Shapes and colors of TriMet signs and poles will help identify the bus stop. Please see Attachment A.

- **ADA landing pad** – *Preferred*. Pursued at new and existing stops, stops with moderate or better ridership (minimum 20 daily boardings) and stops with any lift activity; preferred at all bus stops.

TriMet defines an ADA landing pad as a clear, level landing area a minimum of 5' x 8' (10' x 8' is ideal) located adjacent to the TriMet bus stop sign. At new construction sites TriMet requires ADA pads to be a minimum of 8' x 8'. Construction of ADA pads is pursued at locations where a connection to a pedestrian pathway is possible. Please refer to Attachment A.

- **Rear landing pad** – *Preferred*. In addition to an ADA accessible landing pad to access the front door of buses, TriMet prefers to have an additional landing pad at the rear door. The rear door landing pad should be considered when more than eight (8) daily passenger alightings exist in addition to criteria that warrants an ADA landing pad.

Rear landing pads must be accompanied by a front door ADA landing area. This landing area should also be clear of obstacles and at least 4' x 6'. At new construction sites a rear landing pad should always be pursued, but is not required.

- **Bus zone** – *When necessary*. At bus stops where accessibility improvements are planned, and parking is available, bus zones, no parking areas (NPAs) or other parking control options should be placed. TriMet cannot guarantee bus stop accessibility unless the bus has a clear path to the curb.

For additional information, please see Section III, Part E Roadway Treatments.

Bus stop amenities:

- **Shelter – Optional.** TriMet continues to use ridership figures as the primary criterion for determining shelter placement warrants. Yet several additional criteria are also considered when ridership figures do not support shelter placement.
  - Preferred for stops with 50 or more boardings per weekday
  - Infrequent service – minimum of 35 daily boardings on routes where peak headways are greater than seventeen minutes
  - Lift usage – minimum of 15 weekday boardings and 4% lift usage
  - Proximity to senior housing and a minimum of 20 daily boardings
  - Shelters funded and maintained by others
  - Development of large new activity centers adjacent to transit where ridership is projected to meet criteria
  - Consolidated bus stops – combined ridership totals increase likelihood of shelter placement

If a bus stop meets TriMet's shelter criteria it *may* be considered for bus shelter placement. Meeting these criteria *does not* guarantee shelter installation. Existing site conditions and pedestrian infrastructure, public right-of-way availability, accessibility and safety issues, and other concerns must be reviewed and addressed before future bus shelter placements are confirmed.

Bus shelter placement and orientation should follow the layout options shown in Diagrams 3 and 4. In instances where none of the suggested layouts apply or are feasible, the following should be maintained:

- Five feet of pedestrian passby, including clearance between poles, hydrants and other obstacles.
- ADA landing pad adjacent to sign and outside of shelter.
- Clear pathway from the ADA waiting area inside the shelter to the ADA landing pad.
- Clear pathway from the rear door landing area to the pedestrian path.

A variety of bus shelter shapes and sizes are available to address site restrictions and opportunities, and ridership needs. Please see Table 2 for descriptions.

**Table 2. Shelter Types**

Shelter Type	Dimensions (in feet)	Minimum Required Setback (from curb, in feet)	Minimum Daily Boardings	Other
B	8.5 x 4.5 x 8	11	50	Basic and most common shelter; sited in business and retail districts, residential neighborhoods, industrial and manufacturing areas, etc.
A	8.5 x 2.5 x 8	9	50	Narrow version of B shelter; pursued when a B shelter is warranted but right-of-way is limited.
BX	12 x 4.5 x 8	11	100	Longer version of B shelter; option at stops with strong usage.
AX	12 x 2.5 x 8	9	100	Rarely used; a possibility at stops with strong usage and limited setback.
BB	16 x 4.5 x 8	11	150	Double length shelter; only used at stops with significant ridership and likely only at activity centers.
High Capacity	Varies	Varies	>200	Special shelters for extremely high usage areas e.g., transit centers, light rail stations and high transfer points.
Awning	Varies	Not applicable	Not applicable	Protection provided by businesses...

The specifications for TriMet's current bus shelters as well as shelter pad specifications can be found in Attachment A.

- **Seating – Optional.** Since TriMet has several seating options, bench placement can be considered at any stop where:
  - Accessibility is provided
  - Placement does not compromise safety (it is too close to the street, causes a tripping hazard, etc.)
  - Placement does not compromise accessibility (bench partially blocks the sidewalk, infringes on the ADA or rear landing pad, etc.)
  - Ad bench placement is allowed

Benches can generally be sited like bus shelters; however, they should not be placed closer than three-and-a-half feet from the curb or six feet from the curb when a travel lane exists immediately adjacent to the curb. The same clearance requirements placed on shelters apply here. Benches should be oriented towards the street or the direction of the approaching bus. Table 3 describes current seating options.

**Table 3. Seating Types**

Type of Seat	Length (in feet)	Criteria for Placement	Notes
Shelter Bench	4.0	N/A	Placed in TriMet shelters.
Premium Bench	6.5	Minimum of 25 daily boardings; appropriate surroundings	Often placed in business and retail districts where shelters are not appropriate.
Ad Bench	~6.0	Will be considered at any stop lacking amenities if in a safe location.	Placed for ad exposure or at TriMet's request.
Simme Seat	N/A	Minimum of 12 daily boardings	Mounted on bus stop pole, appropriate where there are curb tight sidewalks (pole placed behind sidewalk).

- **Trash can – Optional.** Trash cans are only placed at sheltered bus stops. High ridership, transfer locations and places where the potential for accumulating trash is apparent influence the decision to place cans, but expansion of the program is limited due to maintenance liabilities and public misuse. Placement must not infringe upon the ADA pad or pedestrian pathway. It must not compromise direct access between the ADA waiting area and the ADA landing pad or access between either ADA area and the sidewalk.
- **Lighting – Optional.** Currently, several options exist. The existing environment usually dictates which option to use. TriMet pursues both overhead lighting oriented towards the bus stop boarding area and bus shelter lighting. The current goal is to provide 1.5 – 2 foot candles of light around the bus stop area.

#### On-street Customer information:

Customers want to know when their bus or train is coming, and if there are any delays or disruptions in service. They also want to be oriented to the system, with clearly marked, visible information available at shelters, stops and stations and on vehicles, to confirm that they are at the right location and ready to board the right vehicle.

- **Transit Tracker by Phone/PDA – Required.** TriMet's Transit Tracker uses satellite technology to track buses, providing customers real-time arrival information at all stops, by phone. Wireless

access for PDAs and internet-ready cell phones is also available. Customers can call 503-238-RIDE and enter their Stop ID number to get real-time arrival information 24 hours a day, 7 days a week.

- **Stop ID numbers – Required.** Stop ID numbers are assigned to each bus stop and MAX station in the TriMet system. At the end of FY10, Stop ID numbers were featured on more than 500 bus shelters, 2900 bus stops, and 244 rail displays – serving a high percentage of riders as a result of prioritizing Frequent Service routes, Transit Centers and MAX platforms. Stop ID numbers will be added to new bus stop signs as they are installed. At the end of FY10, over 50 percent of stops have IDs displayed. Because deployment began with TriMet’s busiest routes, over 90 percent of riders have Stop IDs posted at their stop. By the end of FY11, 72 percent of stops will have Stop IDs displayed.
- **TransitTracker platform displays – Optional.** At high-volume transit locations and on rail platforms, TransitTracker displays provide real-time arrivals for customers. Beginning in 2009, the signs installed are 32” digital flatscreens from Solari Udine, displaying arrivals and service information. In February 2009, five of the signs were installed on platforms for WES, TriMet’s commuter rail service. In September 2009, more than 50 signs were installed at all of the bus stops and MAX platforms on and adjacent to the new Transit Mall, and at MAX stations on the new Green Line I-205 alignment. Due to a cooperative arrangement with the Lloyd TMA and Portland Development Commission, a dozen more signs were added at bus stops and rail platforms in the Lloyd District. Three more signs were installed at the Gateway Transit Center as part of a program to simplify and improve wayfinding information at this complex location.
- **Printed Information – Optional.** Printed route and service information is provided at heavily used stops and transfer points. Currently there are approximately 4,000 information displays containing schedules and maps and stops, stations and shelters throughout the system.

**Table 4. Customer Information Tools**

Information Tools	Function	Where
Stop design consistency, unique shape and color of sign & pole	Identification	All stops
Bus stop sign	Basic service information and orientation	All stops
Information units	Schedule, route map	Stops with bus shelters or on TriMet poles (at locations with high ridership, transfer points, transit centers, transit generators and in some cases to promote new service).
Transit Tracker	Automated bus arrival times	By phone or display units located at high-volume transit stops

*What TriMet wants to accomplish:*

TriMet places bus stop elements, amenities and customer information to:

- provide safe, level landing pads for front and rear doors (front door pad must be ADA compliant);
- make waiting customers visible to the bus operator and vice versa;
- minimize maneuvering difficulty for riders with wheelchairs and other ADA mobility devices;
- make all parts of the transit experience as comfortable and convenient as possible, given financial resources;
- keep accessible through-path on sidewalk;

- provide a clear and consistent on-street image;
- ensure that TriMet poles and signs are readily visible to patrons, pedestrians, bus operators, and motorists;
- provide basic information to orient bus patrons; and
- provide targeted information that enhances the riding experience

### *Considerations*

Every site will present a unique list of issues. The following is a checklist of the most important considerations:

For elements and amenities:

- ☐ Safety
  - Waiting, boarding and alighting must be safe
  - Provide adequate sight distance, i.e., provide visibility between bus driver and waiting riders
- ☐ Visibility of passengers to operators, and vice versa
- ☐ Accessible for all
  - Slope
  - Minimum 5' x 8' ADA concrete pad at stop
- ☐ Stops must be suitable for bus operations
- ☐ Ridership and lift usage
- ☐ Elderly housing, hospitals and compelling land uses can lower minimum criteria for amenities
- ☐ Clear sight lines for pedestrians and traffic
- ☐ Ensure compatibility with adjacent properties
- ☐ Avoid private property when possible
- ☐ Consider possible partnerships with private landowners and businesses (e.g., awnings, Adopt-A-Stop, etc.) when needed
- ☐ Minimize conflict with trees and other nearby features
- ☐ Cost
  - Initial capital and installation cost
  - Long-term maintenance cost
  - Replacement cost

For customer information, also consider:

- ☐ Patron usage
- ☐ Transfer locations
- ☐ Service frequency
- ☐ Schedule reliability
- ☐ Special needs
- ☐ Stop location on route



*Table 5. Bus Stop Classification*

Stop Type	Underdeveloped	Basic	Level 1	Level 2	Level 3
Use/Stop Type Designation Criteria	Poor, or lack of, supporting land uses; few or no boarding rides; closely spaced with another stop	All stops meeting spacing/siting criteria	High use stops (35 BR+ / day); significant employer program participant; apartments; institutions; hospitals; shopping centers; major business; minor park & ride lots (shared use); stops with significant usage by riders who are disabled or elderly	Major stops (200+ BR / day); transit mall; major park & ride lot (TriMet dedicated); all transfer points; stops with active lift or ramp usage	Bus Rapid Transit service; transit centers; high volume park & rides; major transfer hubs
	No pavement; inadequate shoulder; visibility blocked; poor lighting; insufficient ADA clearances; undue exposure to weather/ traffic; shared pole; one sided visibility	Pavement meets ADA clearances; bus stop sign on dedicated pole	<i>Preceding features plus:</i> Standard (A or B) shelter (larger if justified); lighting (utility pole or shelter); BCID in shelter; free standing bench; pad for rear door, when physically possible	<i>Preceding features plus:</i> 16' or high capacity shelter; BCID or transit tracker; trash can; bike rack; public telephone (dial out only); free standing bench; art work	<i>Preceding features plus:</i> "Station" style shelter; free standing bench(s); bike lockers, lids or other long-term storage; operator building and restroom as needed; ticket vending machine; artwork element
TriMet Managed Bus Stop Features	<i>Any combination of the stated features</i>				
Externally Managed Features	No clear, safe pedestrian access; no logical, safe street crossing; unsafe topography; standing water; unpleasant site conditions	Safe street crossing (corner, ADA ramps); sidewalk or safe shoulder access	<i>Preceding features plus:</i> sidewalk connections; curb extensions; crosswalks	<i>Preceding features plus:</i> art enhancements (TriMet or community); community bulletin board; newspaper vending bins	<i>Preceding features plus these possible features:</i> concession or nearby shop(s); landscaping (low maintenance); public restroom; U.S. mail box

## D. Bus Stop Layouts and Design

In the past, bus stops were designed on a stop-by-stop basis leading to a wide variety of layouts and an inconsistent message to TriMet patrons and operators. Successful bus stops are designed to link to other transportation modes, existing or planned. Accommodating sidewalk systems is critical to assuring the safe and accessible transport of TriMet patrons between the origin/destination and the bus stop.

Following this section, bus stop layout diagrams are presented. They are designed to respond to existing conditions and incorporate only basic amenities. The diagrams are also intended to clearly indicate where buses stop, and where patrons wait and board. All examples assume that an accessible pedestrian system is already in place.

Stop elements and amenities covered in the diagrams:

- TriMet pole and bus stop sign – Required. The pole/sign is the cornerstone of all bus stops. Its placement must be considered carefully.
- Bus stop landing area – An ADA landing area is required by federal and state law for all newly constructed stops. Optimally, TriMet will provide a safe landing area for all bus doors. The ADA landing area must be placed adjacent to the bus stop sign whenever possible.
- Bus zone or no parking area – Required where parking might otherwise block the bus's ability to pull to the curb. The bus must get to the curb to provide accessible entry. Eliminating parking at the stop accomplishes that goal. Curb extensions and other expensive solutions are discussed in Section III, Part E Roadway Treatments.
- Bus shelter and shelter pad – Optional. Shelter from the elements makes the transit experience more pleasant. The shelter's placement and its orientation to other elements are critical.
- Trash can – Optional. Placement is often an afterthought. When placement is planned, trash cans should be incorporated into the bus stop design.

Stop elements and amenities not covered in the diagrams:

- Curb ramps – The following layouts assume curb ramps are present. If they are missing, TriMet or the local jurisdiction will install at least one when constructing other improvements.
- Lights and other amenities – Great enhancements, but not covered in these diagrams. These are optional elements.
- Bus zone and no parking area signage – Every jurisdiction does it differently. One to four poles are possible. These are too variable to show in a diagram successfully.
- Service information – Important, but not critical to stop layout because the information is usually attached to a bus shelter or bus stop pole.
- Trees, fire hydrants, mailboxes, driveways, power poles, etc. – Continue to be accommodated on a stop-by-stop basis.

Standard clearance requirements at *all* stops:

- Sidewalk clearance – Maintain minimum five feet of sidewalk clearance
- Accessible pathway – Minimum five foot wide path between shelter and any utility objects
- Road clearance – Minimum two foot clearance between shelter and edge of curb (extra care must be taken because newer vehicles have longer tail-swing)
- Building clearance – Minimum 12" from buildings, fences, and other structures to allow room for maintenance
- ADA landing area – Minimum 5' x 8' "clear and level surface" at curb for lift or ramp operation

Requirements for *all* stops with shelters:

- ADA waiting area in shelters – Minimum 2'6" x 4' space must be kept clear for mandatory waiting area to accommodate mobility devices.
- Visibility – Shelters must not block motorists' or pedestrians' line of sight
- Relation to bus stop – Shelter should be within a compact space, close to landing area for access to bus (generally within 25').

Diagram 3

## Basic

### Bus stop design: Sidewalks with furnishing zones

## Expanded

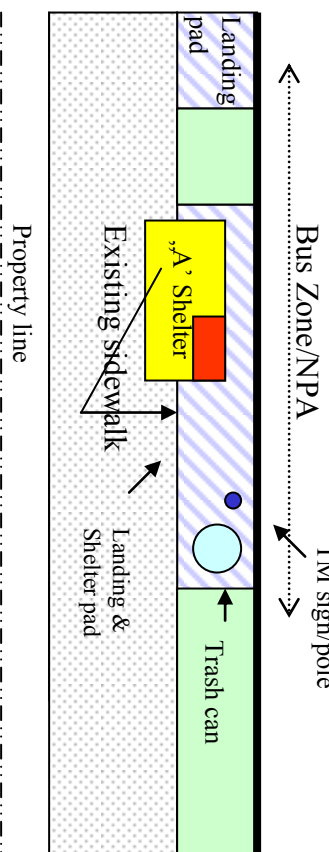
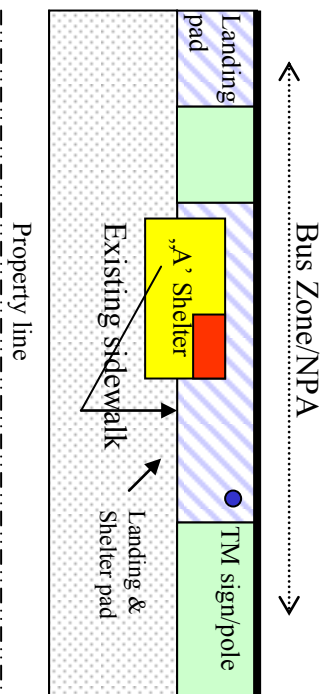
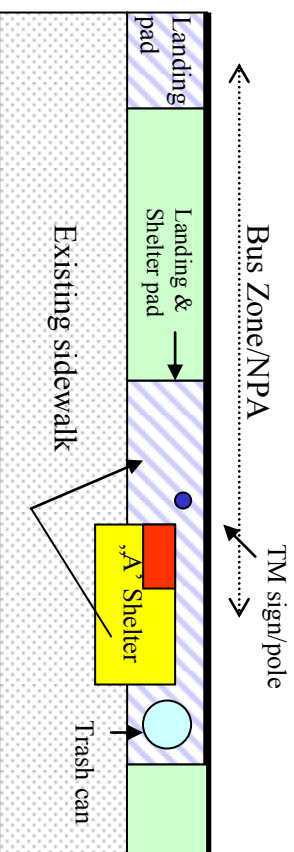
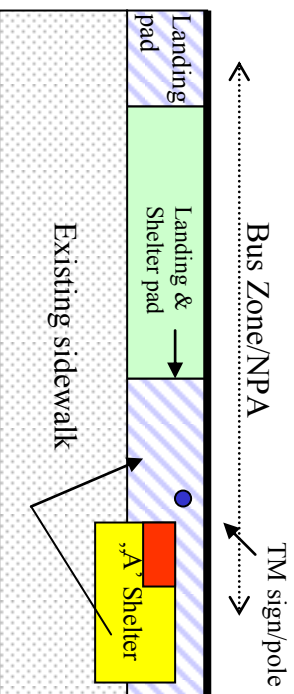
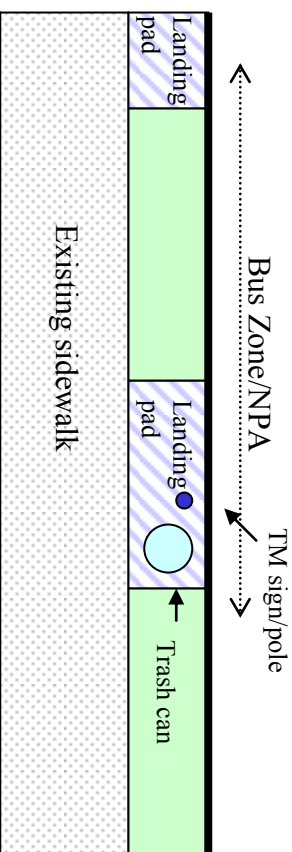
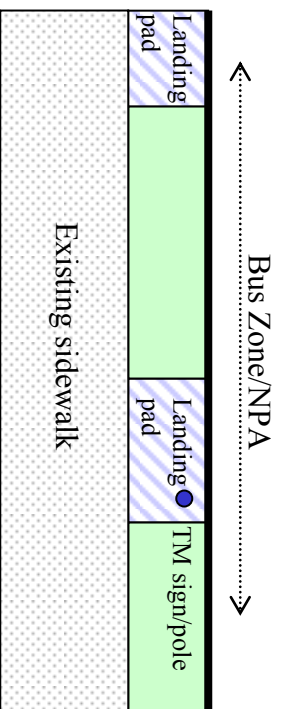
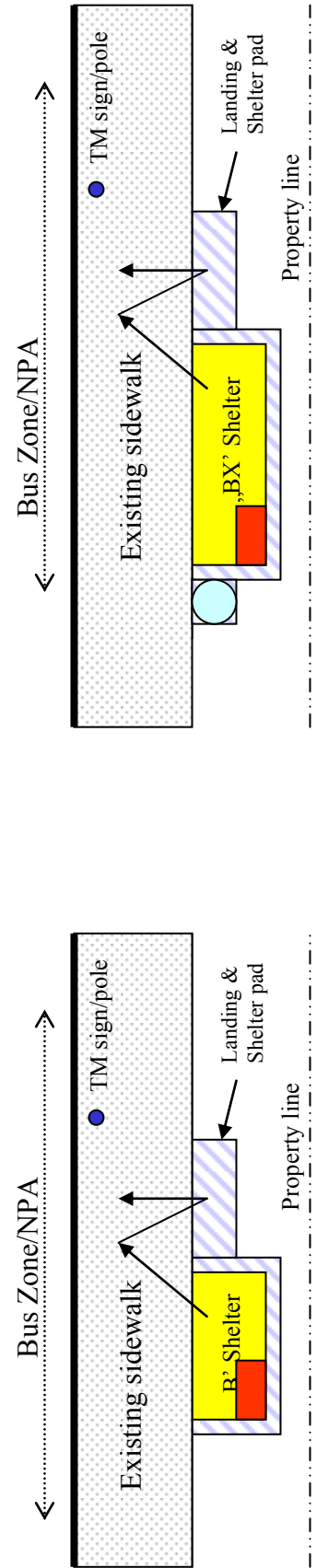
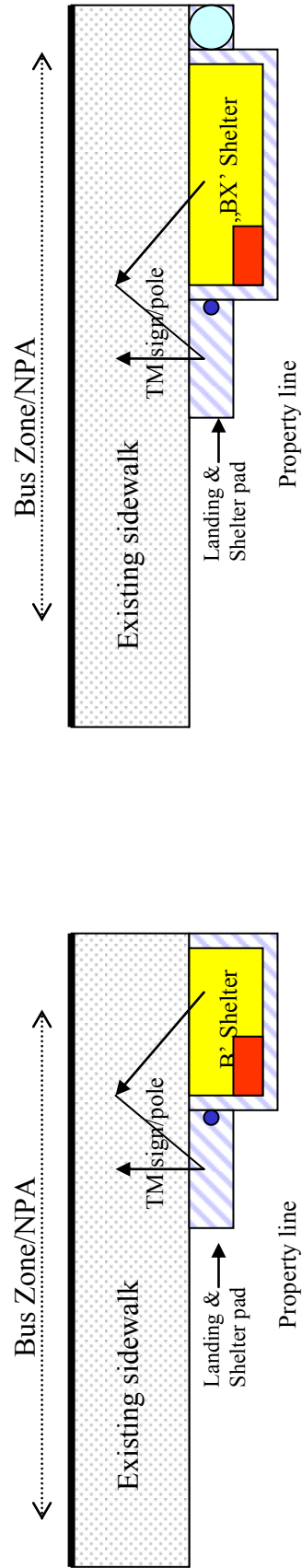
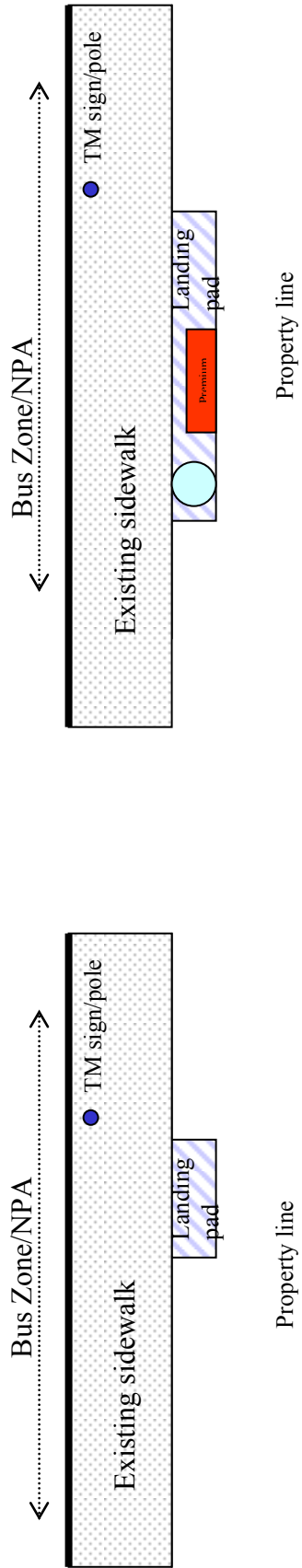


Diagram 4

# Bus stop design: Sidewalks without furnishing zones

## Basic

## Expanded





## E. Roadway Treatments

### *Approach*

Change management or structure of roadway to improve transit efficiency and accessibility. Focus on locations or corridors with the highest delays and/or those that create the most variability in on-time performance. Consider ridership and lift usage at stops.

### *Tools*

#### **1. Bus zones or other parking restrictions**

A bus stop is not considered accessible unless the bus can reach the curb. Bus zones, no parking areas (NPAs) and other parking restrictions are often necessary to assure access. Bus zones or NPAs are required when:

- it is determined that a stop must be accessible.
- parking is allowed at the stop.
- there is not justification for a curb extension, stop move or stop deletion.
- buses lay over.

Nearside (NS) Bus Zones - preferred length is 90' measured from the bus stop sign. In extreme circumstances NS bus zones can be shortened to 60', however buses may not be able to clear the travel lane. At signalized intersections the bus should stop a minimum of 15' from the pedestrian crossing so that approaching drivers will be able to see pedestrians using the crosswalk. The area between crosswalk and bus stop must also prohibit parking.

Farside (FS) Bus Zones – preferred length is 90' measured from the crosswalk. In all instances the rear of the bus must clear the crosswalk. Farside zones can be shortened to 60', however buses may not be able to clear the travel lane. Bus stops with multiple routes require longer zones. When 2 buses must be accommodated frequently zones should be 100' long. Each additional bus requires another 50' in length.

Midblock (AT or OP) Bus Zones – preferred length is 100' measured from the bus stop sign. A minimum length for midblock zones is determined on a site-by-site basis. These zones are infrequently used, but are found on “super-blocks” often opposite of „T” intersections in high-density areas and along mid- and lower density area roadways with few intersections.

Bus zones must be clearly marked – since parking control is provided by jurisdictions, so is the signage and marking requirements, resulting in several variations. Generally bus zones are marked by a front zone sign/pole, and a rear zone sign/pole. At farside zones, bus stop markers are often used to indicate where the bus should stop (to allow enough space to pullout). An NPA sign/pole may be added at the front of a bus zone to clearly define ambiguous frontage (i.e., between a zone and a driveway, or a zone and a fire hydrant). The City of Portland applies yellow tape to the curb tops in bus zones to further define the space.

#### **2. Curb extensions incorporating transit stops**

Curb extensions are a popular roadway treatment often used in streetscape improvement plans. For best effect, extensions are placed along a corridor in series of two or four to an intersection. Under this scenario the extensions improve pedestrian connections by shortening street crossing distances, and enhancing sight angles for pedestrians and motorists.

For transit, curb extensions have several benefits. They:

- provide buses with access to the curb from the travel lane without deviation (no pulling in or merging) thereby reducing dwell time.
- can reduce nearside stop turning conflicts on two lane roads by blocking through traffic.
- provide patron waiting and boarding areas separated from pedestrian movements on sidewalks.
- provide room for stop amenities or other streetscape features.
- visually designate a street as a pedestrian friendly transit corridor.

Designing/building curb extensions that work well with transit is not an easy task. Designers must battle with the competing cross slopes of the existing roadway and sidewalks, consider drainage and relocate sewer grates. As a result, designers often struggle to provide a landing area that allows low floor bus ramps to deploy at an ADA acceptable slope.

Following are the general requirements for transit stop curb extensions:

- Transit curb extensions should be paired with a pedestrian or transit curb extension across the travel street.
- Curb extensions must be clearly marked/and designated to improve their visibility to motorists.
- Extensions must provide a minimum 32' of curb line free of ramps, wings and curb returns. At farside extensions, the bus must be clear of the crosswalk, requiring a minimum of 42' of clear curb line.
- A 6' x 8' clear space must be defined at front and rear door locations
- Bus shelters, poles, trees, benches, trash cans and other amenities must be placed a minimum of three-and-a-half feet clear of the curb face.
- The placement of hydrants, bicycle racks, artwork, drinking fountains, non transit signs and poles and other street furniture must be carefully considered and coordinated with TriMet. There is significant potential for conflict with transit operations when too many items end up on an extension.
- The incorporation of storm water planters in curb extensions is a relatively new phenomena that is best suited for non-transit extensions. However, jurisdictions have worked with TriMet to incorporate storm water planters in several curb extensions and are in the process of developing best practices.
- Placement of curb extensions, whether nearside, farside, at signalized or non-signalized intersections must be made on a case-by-case basis. Generally, nearside curb extensions are preferred at non-signalized intersections.

### 3. Bus pullouts and bus pads

A bus pullout's primary function is to move buses out of travel lanes where they might impede traffic flow. Although there are scenarios where this is a valuable function, TriMet does not actively pursue the placement of bus pullouts at regular bus stops because it reduces the efficiency of transit service. TriMet will consider accepting pullouts:

- at bus layovers (where buses park for several minutes)
- at selected bus stops on roads with at least two of the following:
  - posted speed limit at or above 40 mph
  - ridership above 35 daily boardings (or six (6) daily lift boardings)
  - potential safety issues

Concrete bus pads are often incorporated in pullout designs but are also used at curbside bus stops. Bus pads are considered on a case-by-case basis but are generally found at stops with frequent service, significant ridership, or where heavy bus braking and acceleration is necessary.

#### 4. “Except Bus” signage, queue jump signals and bus only lanes

These treatments should be pursued on major trunk routes, cross-town routes or any high frequency bus routes with significant traffic delays during peak periods. “Except Bus” signage is the most common treatment where a nearside bus stop at a signalized intersection uses a right turn pocket. Queue jump signals are used in conjunction with an “except bus” queue jump lane (especially when there is no farside lane) to provide safe merging into traffic lane. Bus only lanes provide exclusive right-of-way to bypass congestion, but are only used when adequate right-of-way is available.

#### *Preferences*

Each treatment has differing effectiveness based on the individual circumstances. Detailed analysis of such issues as traffic volume, ridership, safety, right-of-way, and delay to transit are required. The City of Portland’s Transit Preferential Streets Program Sourcebook (June 1997), developed with TriMet participation, and TriMet’s Streamline project guidelines contain more information on these tools.

#### *Considerations*

Every site will present a unique list of issues. Use the following as a checklist of the most important considerations:

- ☐ Pedestrian safety
- ☐ Traffic safety
- ☐ Transit operation safety
- ☐ Schedule reliability
- ☐ Transit travel time and speeds
- ☐ Impact on traffic
- ☐ Costs/Benefits

#### F. Bus Stop Access

It is essential that bus riders have safe access to their bus stop. Walking on narrow roadway shoulders, through mud or puddles, or through ditches is unacceptable to most bus riders and is often unsafe. TriMet does not hold responsibility for construction or maintenance of sidewalks or curb ramps, but TriMet can leverage their construction through partnerships with jurisdictions and property owners or solicitation of regional funding for their construction. The pedestrian network is not only essential for transit access, but benefits the community and the region by encouraging walking for local travel.

TriMet must work with Metro and local jurisdictions to identify deficiencies in the pedestrian network using geographic information system (GIS) tools and then assign priorities for a pedestrian network development program. Some key considerations would include:

- Direct, paved, ADA compliant walk connections between any moderate-to-dense neighborhood or business center and transit stops. These should be on at least one side of the street.
- Pedestrian connections need to be continuous, with a safe crosswalk where sidewalks must shift from one side of the street to another. Driveways need to be limited and well lit for pedestrian safety.
- Designated and protected pedestrian crosswalks across arterial streets, no further apart than three blocks or 780 feet.
- Street lighting, particularly at street crossings.
- ADA compliant curb ramps at each intersection.

- Sidewalks need to be in good repair and free of trip hazards, preferably with a planted buffer or furnishing zone between the sidewalk and auto traffic.
- Sidewalks and bus stops will be coordinated to provide ADA clearances and amenities of mutual benefit to both pedestrians and bus riders.

TriMet will support efforts to secure funding for pedestrian network development including Federal programs and their local allocation, designation of improvement districts or assignment of local Traffic Impact Fees (TIF) or other local tax mechanisms.

## IV. Public Involvement and Input

### A. Citizen Involvement

Bus stops as public spaces are as much a part of a community as streets, pathways, parks and plazas. TriMet encourages communities and citizens to recognize their value and to build a sense of ownership.

*Adopt-A-Stop* – A business, church, community organization or similar agrees to empty a TriMet provided trashcan as needed. If there is any damage to or graffiti on the trashcan TriMet will take care of it. The sponsor benefits from having a trashcan at a stop where TriMet would not ordinarily be able to provide one.

### B. Public Notification of Impending Changes

Before stops or shelters are removed the affected stops should be posted with an informational flier for a minimum of two weeks to alert customers and allow for rider comment. This does not apply if shelters or stops must be removed immediately due to safety concerns.

Before a stop is permanently added, letters are sent to adjacent property owners and occupants warning them of the impending change as soon as possible, preferably at least two weeks in advance. While TriMet has the jurisdiction to place stops in the public-right-of-way, we invite property owner input prior to changes.

### C. Common Public Complaints and Responses

#### *Stop Move/ Removal*

Most TriMet stops are located legally within the public-right-of-way on public property. As a public transit agency TriMet's job is to serve everyone and provide the best service possible. The placement, movement or removal of a bus stop is an extremely complex and costly process that involves a variety of safety and technical considerations. It requires a great deal of input and cooperation from several internal and external stakeholders. It is not a decision that is made lightly.

TriMet cannot move a bus stop unless there is a major safety concern, or there is an opportunity to improve the safety, accessibility, or amenities at a new location that has been evaluated and confirmed by our planners. In response to nuisance issues like littering or rude behavior we try to work with adjacent property owners to reduce the issues they're facing. Moving riders to another location will only move the behavior, not solve it.

*Trashcan Requests*

TriMet cannot maintain a trashcan at a bus stop that does not have a shelter. However, if an adjacent business owner is willing to adopt the can (and empty it weekly, or as needed) we can consider it.

If the stop does have a shelter, Facilities is usually still hesitant to maintain a trashcan because they don't want the added budgetary impact. Often they suggest trying to get an adopter, or having an extra cleaning at the shelter before a trashcan. Generally, they'll only support a trashcan at a shelter, if no one will adopt the stop and the shelter has really high ridership.

TriMet maintains trashcans on all of our buses to encourage customers who are boarding or deboarding the bus to properly dispose of their garbage, rather than throw it on the ground. Unfortunately, we cannot control the behavior of our riders and many of them simply ignore the trashcan and choose to litter.

Due to a lack of resources our trashcan placements are limited to stops with the highest ridership that have shelters. Our shelters are cleaned weekly and this allows the trash to be emptied. At bus stops without shelters, trashcan placements are pursued only when an adjacent business is able to maintain the trashcan through the TriMet Adopt-A-Stop program.

*Amenity Requests*

Refer to amenity placement guidelines.

**D. Development Review****1. Background**

TriMet has been conducting development review on transit-adjacent development for over sixteen years. This review process has fostered strong relationships with local jurisdictions, while helping to facilitate better designs for new development. The review process enables TriMet to be involved early enough in the process to influence the land use and infrastructure designs being proposed. Including transit improvements as part of new development helps to mitigate for transportation impacts and allows the cost of these amenities to be shared by developers. In the end, these partnerships stretch resources and create a more comprehensive transit system.

**2. Improving stop placement**

With an emphasis on bus stop improvement and support, TriMet primarily reviews development projects located directly on transit routes. For significant projects, stop spacing, location and usage along the adjacent route segment are analyzed to determine whether stop relocation or adjustment would facilitate: a) better access to transit, b) patron and pedestrian safety, c) transit operational efficiency, or d) traffic safety. If appropriate, modifications to roadway and frontage design, signalization, pedestrian pathways and street or parking lot crossings will be considered.

**3. Private sector purchasing amenities, adopting stops**

Depending on the size and nature of the development or development action, TriMet may request improvements to adjacent bus stops. If frontage improvements are planned TriMet will request the addition of an ADA landing pad and a rear door landing pad at stops that lack them. If ridership potential exists, TriMet may request that a developer provide a bus shelter, a bench or other bus stop amenities as warranted. In some instances, developers may want to provide a bus shelter where only limited ridership is projected (e.g., to satisfy a condition of approval or to receive an exemption from certain conditions of approval). In this scenario, TriMet asks developers to take an active role in caring for the stop by adopting the stop, sponsoring a trash can or agreeing to regularly clean the stop.



#### 4. Private sector designing transit stops and plazas

Some jurisdictions are asking developers and their architects to incorporate transit stops into their projects' designs. Building and frontage themes are replicated at the bus stop, creating transit plazas that visually relate to the project. Awnings, columns, pedestals, shelters, benches and public art provided by developers are not standard TriMet issue, therefore, their care becomes the individual property owner's responsibility (TriMet still provides and maintains signage and customer information).

### E. Public Partnerships

#### 1. Responding to the Regional 2040 Framework Plan and Regional Transportation Plan

The 2040 Regional Framework Plan provides a long-range vision for livability in the Portland metropolitan area. It defines expectations for the Portland region's city center, regional centers, town centers, station areas and main streets, all of which envision levels of urban density that are supportive of transit service. The plan calls for an extensive transit network utilizing various forms of transit - from high capacity transit, like light rail or bus rapid transit, to local neighborhood buses.

The Regional Transportation Plan (RTP) is a 25-year transportation plan for the region. It is updated every four years and provides a shared plan for implementing the transportation elements of the 2040 Regional Framework Plan. The RTP was last adopted in 2010. Within the plan there is guidance on the levels of transit service communities should expect, provided they develop in a transit supportive way, and mode split targets for walking, biking, taking transit, and carpooling. Jurisdictions are required to adopt Transportation Systems Plans (TSPs), which demonstrate how they will achieve their community's non-single occupancy vehicle mode split target. In addition, the 2010 Regional Transportation Plan outlines ten performance targets the region wants to achieve by 2035. The ten targets address safety, congestion, freight reliability, climate change, active transportation, basic infrastructure, clean air, vehicle miles traveled, affordability, and access to daily needs. The services TriMet provides will be fundamental to helping the region reach many of these targets.

TriMet is a necessary partner in both the formulation and execution of these plans. Jurisdictions and TriMet must work together to define transit priority corridors, traffic management tools and streetscape improvements that will encourage walking, biking, and taking transit and reduce people's reliance on the single-occupant vehicle. This partnership is also critical to encourage land uses along transit corridors (Transit Oriented Development or TOD) that take advantage of the public investment in transit services.

#### 2. TriMet partners to improve other jurisdictions projects

TriMet Project Planning staff is available to provide support for jurisdictional planning efforts that have transportation elements related to transit. Examples include: 2040 center, station area, main street, or corridor plans; streetscape, traffic calming, or street right-of-way improvement plans and Transportation System Plan (TSP) updates. These are a just a few examples of planning and implementation efforts that can benefit from TriMet's input. Jurisdictional plans that recognize, coordinate with, or incorporate TriMet service and capital improvement plans will likely result in better transportation and transit outcomes.

#### 3. Jurisdictions partner with TriMet to improve transit projects

Project Planning also invites key jurisdictional staff to be part of TriMet project teams. Their support and input is critical to the success of TriMet projects as well. The cooperation amongst jurisdictional partners influence key planning decisions, facilitates key design elements, promotes simplified permitting and improves interagency communication.

#### 4. Improving coordination through IGAs and MOUs

Intergovernmental Agreements (IGA) and Memorandums of Understanding (MOU) are documents that recognize project and program partnerships. TriMet and the City of Portland have developed several IGAs that have greatly improved TriMet's ability to provide accessibility and comfort to neighborhood bus stops. For example, a carriage walk agreement between Project Planning and the Bureau of Maintenance has allowed the agencies to coordinate bus stop accessibility improvements, like ADA landing pads and curb ramps, with the city's own efforts to upgrade the pedestrian infrastructure with curb ramps and accessible sidewalks. A bus shelter siting agreement has allowed TriMet and the City to simplify the siting and permitting process, putting amenities on the street more quickly. TriMet continues to pursue agreements like these with its regional partners to make better and more efficient use of available funding, and to provide timely, coordinated projects.

## V. Bus Stop Development Projects

TriMet initiates capital projects to make significant improvements to route efficiency, on street and bus stop safety, accessibility and comfort. TriMet utilizes the tools and methodology introduced in these guidelines to provide an improved product that integrates with existing transit service.

Following are recent or current capital projects, their intent and their effect.

### On-street Transit Facilities Development Program

INITIATED: 2008 with the distribution of regional Metropolitan Transportation Improvement Program (MTIP) funds

COMPLETED: On-going – current emphasis is on improving pedestrian safety.

STATUS: 10 sites improved with integrated sidewalk and bus stop ADA improvements.  
Construction underway at pullout and curb extension (one each).

PRIMARY GOAL: To increase transit ridership by improving the total transit experience – focused on on-street transit and pedestrian facility improvements.

TARGETS: Provide functional accessibility at 65% of all bus stops.

PRIMARY TOOLS:

1. Capital Improvements - Curb ramps, ADA landing pads, sidewalks, curb cuts
2. New poles and bus stop signage
3. Limited amenities (benches, shelters, solar LED lighting)

### ***Signal Priority (Streamline)***

INITIATED: 1999 with the release of the 99/00 Capital budget.

COMPLETED: On-going -- all Frequent Bus routes have received Streamline review and spot treatments where appropriate.

STATUS: Lines 75 and 77 received a signal indicator countdown light at HTC to enhance bus operations. Lines 12, 65 and 94 will receive a permissive left turn phase upgrade at Barbur TC

PRIMARY GOAL: To improve bus service reliability and reduce travel time while also improving patron safety, accessibility and comfort on selected routes.

TARGETS: Reduce travel time to significantly impact riders' perception of time savings. Reduce resources necessary to operate service at current frequency.

PRIMARY TOOLS:

1. Traffic signal transit priority treatments
2. Roadway treatments (bus only lanes, queue jump and bypass lanes, curb extensions, turning radius improvements, lane adjustments etc.)
3. Bus stop relocation, consolidation and removal
4. Route simplification

### ***Bus Shelter Expansion***

INITIATED: 2000 with a public announcement of the placement of 100 new bus shelters during FY 2000/2001.

COMPLETED: On-going – current plan to continue until 500 new shelters have been placed.

STATUS: Underway with assessment at 15 sites –work elements include site plan & design, permits, construct pads

PRIMARY GOAL: To improve patron comfort at bus stops currently lacking shelter. Upgrading accessibility if needed.

TARGET: Meet primary goal.

PRIMARY TOOLS:

1. Bus shelters
2. Bus shelter pads
3. Curb ramps
4. ADA and rear landing pads
5. New poles and signs
6. Bus zones and parking restrictions
7. Limited additional amenities (trash cans, lighting, BCIDs)

***Security Lighting at Bus Shelter and Stops***

INITIATED: 2004 with installation of 100 solar LED lights onto bus shelters on TV Hwy, Barbur Blvd and Powell Blvd

COMPLETED: Ongoing. Site reviews continue to assess night-time illumination needs.

STATUS: Currently approaching 320 shelter sites and 30 bus stops.

PRIMARY GOAL: Improve security and safety for waiting patrons

TARGETS: Provide accessible, safe, lighted, covered bus stops at more locations.

PRIMARY TOOLS:

1. Solar LED lighting kits – shelter or pole mounted
2. Relocate bus stops
3. Amenities improvements -benches, shelters, lighting
4. Bus shelter electrification where costs are nominal

***Bus Stop Sign & Pole Replacement with Customer Information Displays***

INITIATED: 2000

COMPLETED: Ongoing. In last year of program

STATUS: Over 60 percent of system wide signs and poles have been upgraded

PRIMARY GOAL: Deploy new two-sided bus stop signs and poles to distinguish bus stop identity and place. Install printed bus stop identification numbers at each bus stop pole.

TARGETS: Allow rider to identify bus stop and allow quick access to real-time arrivals through TransitTracker by Phone.

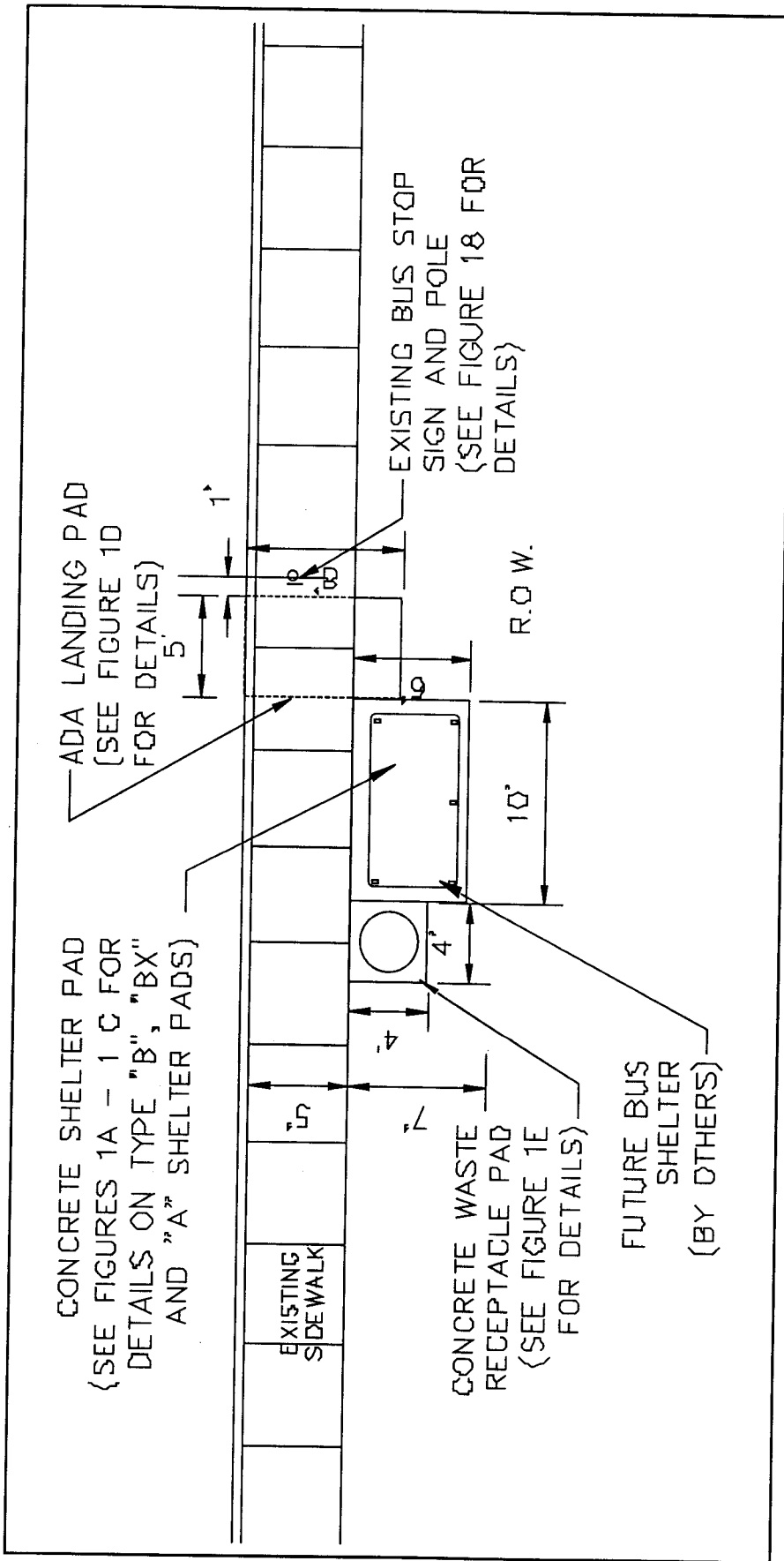
PRIMARY TOOLS:

1. New signage and poles
2. Passenger level ridership census
3. Route-by-route assessment of every bus stop
4. GIS

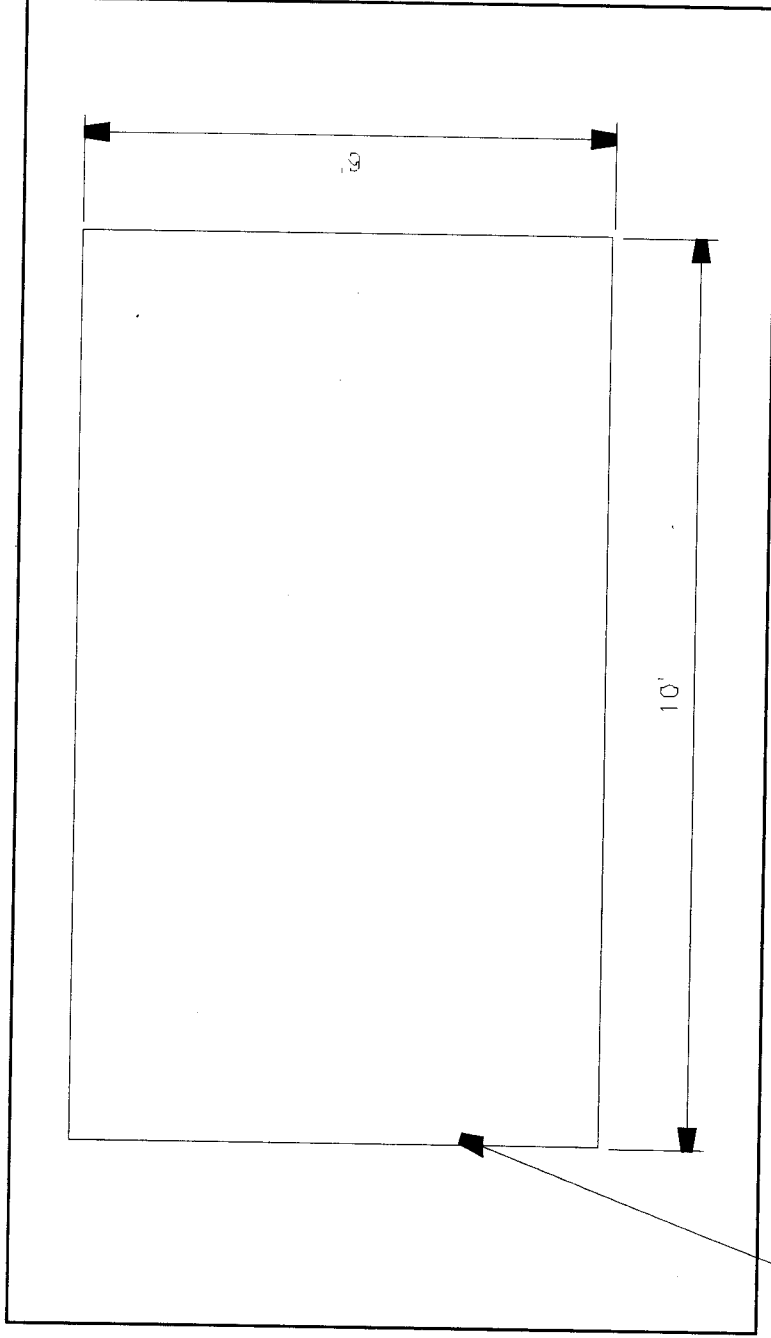
## Attachment A

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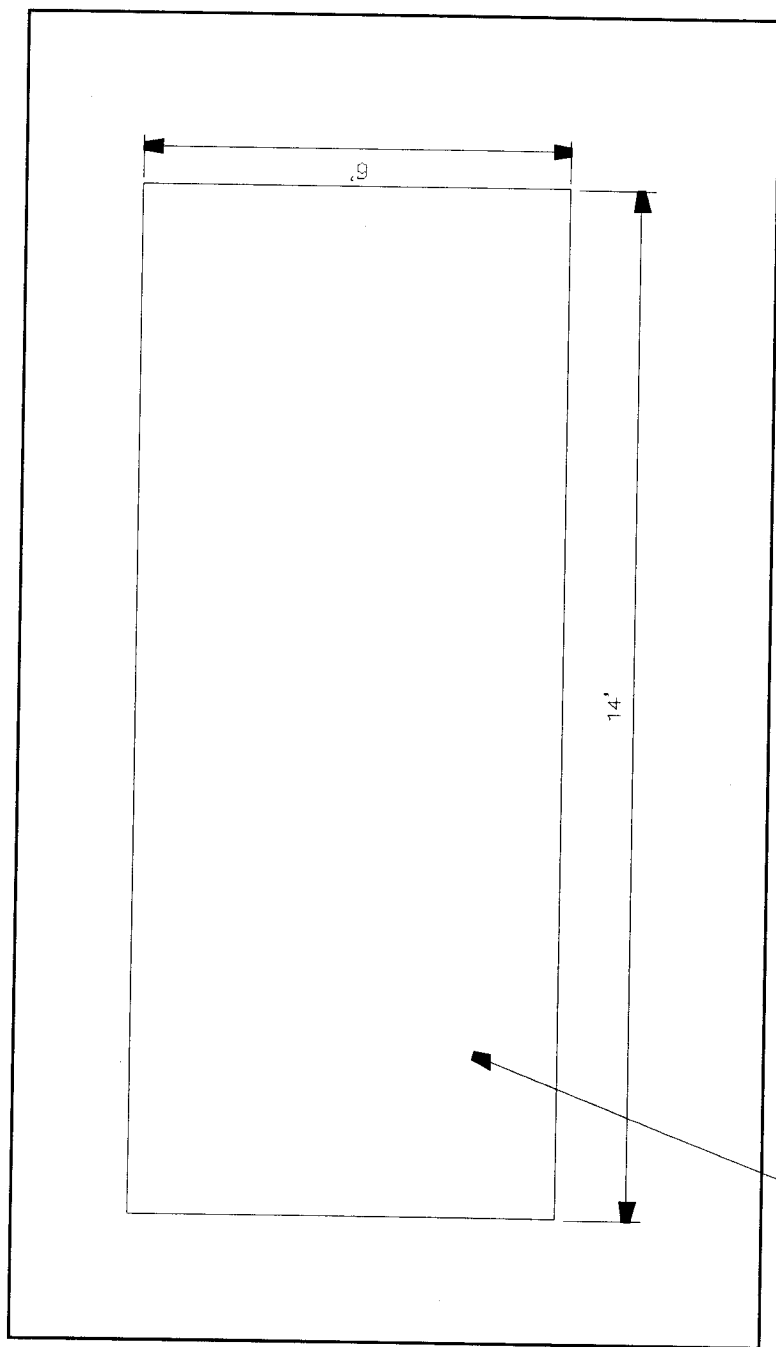
Shelter Pad/ADA Pad  
Figure 1



— CONSTRUCT CONCRETE SHELTER PAD 5.5" MIN. THICKNESS, 3000 PSI PCC WITH 2" COMPACTED AGGREGATE BASE. SLOPE TO DRAIN TO CURB (NOT TO EXCEED 2%).

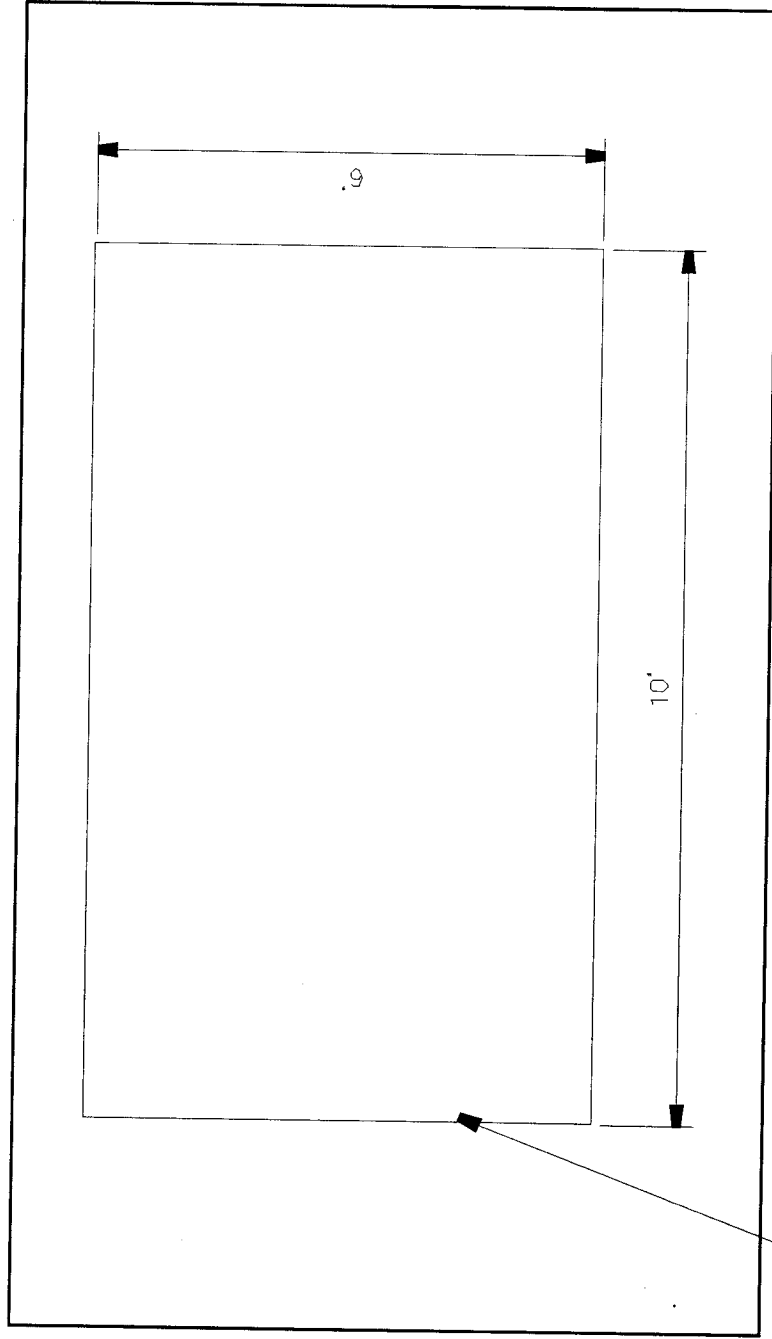
Type "B" Shelter Pad  
Figure 2





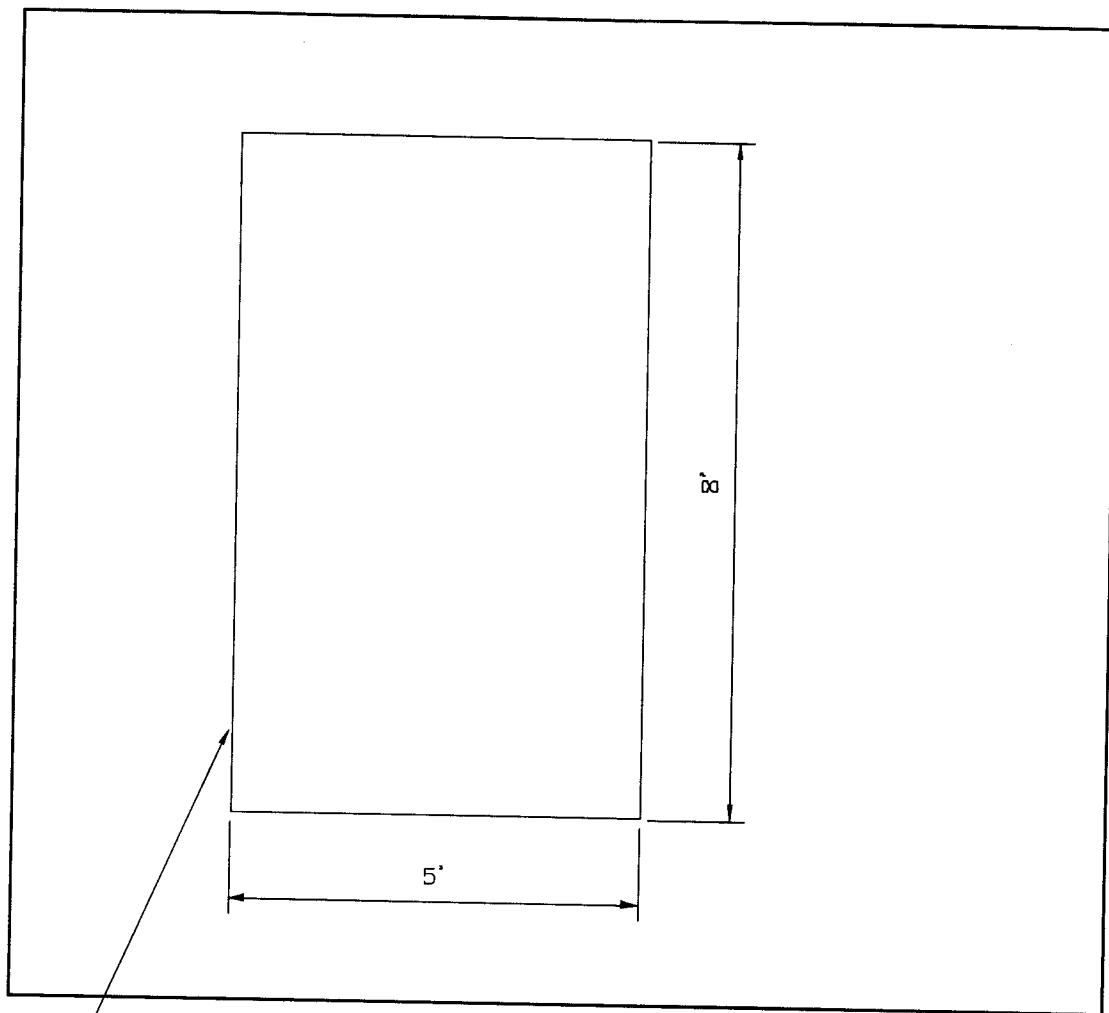
CONSTRUCT CONCRETE SHELTER PAD 8" MIN.  
THICKNESS, 3000 PSI PCC WITH 2" COMPACTED  
AGGREGATE BASE. SLOPE TO DRAIN TO CURB  
(NOT TO EXCEED 2%).

Type "BX" Shelter Pad  
Figure 3



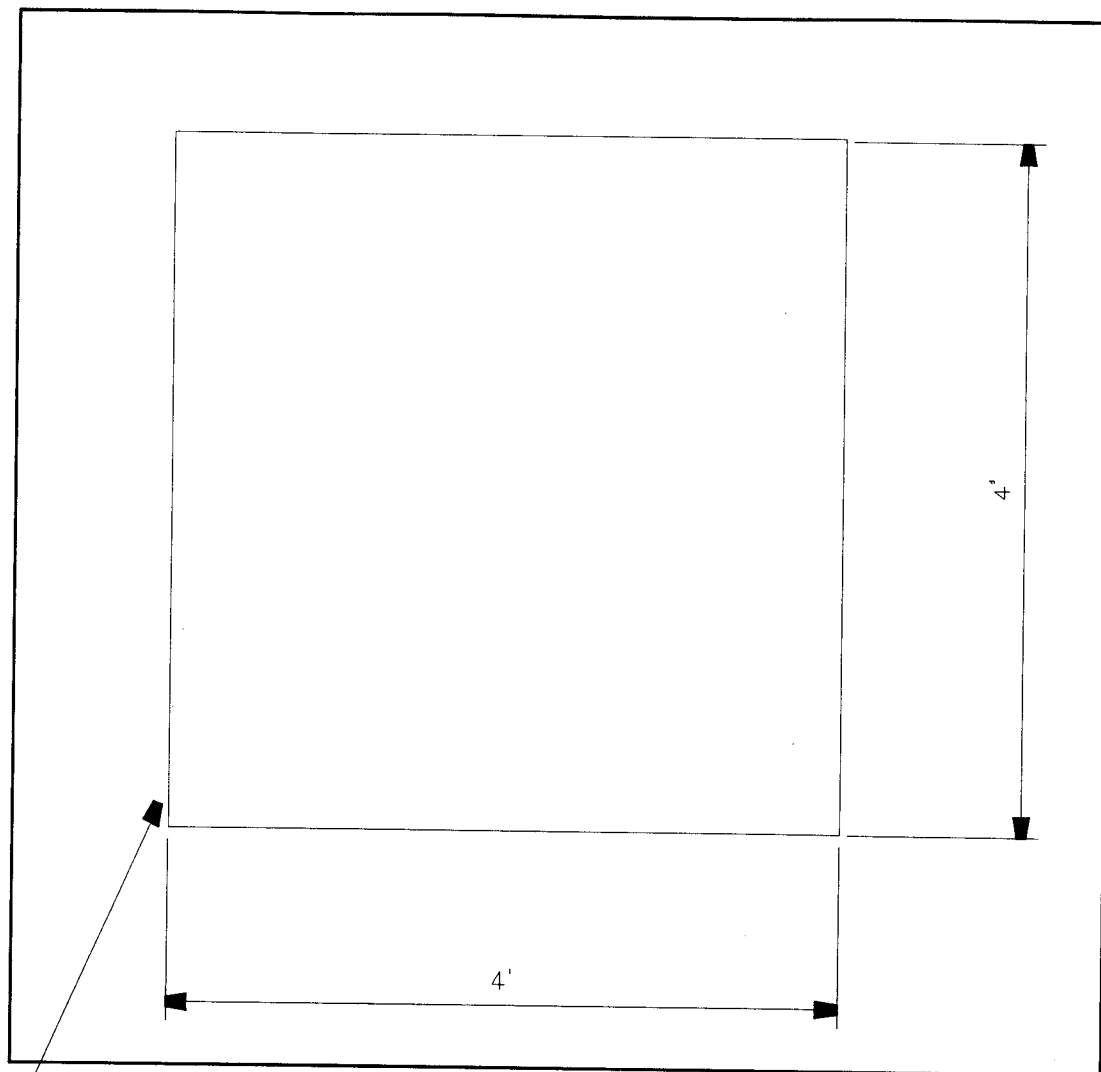
— CONSTRUCT CONCRETE SHELTER PAD 5.5" MIN.  
THICKNESS, 3000 PSI PCC WITH 2" COMPACTED  
AGGREGATE BASE. SLOPE TO DRAIN TO CURB  
(NOT TO EXCEED 2%).

Type "A" Shelter Pad  
Figure 4



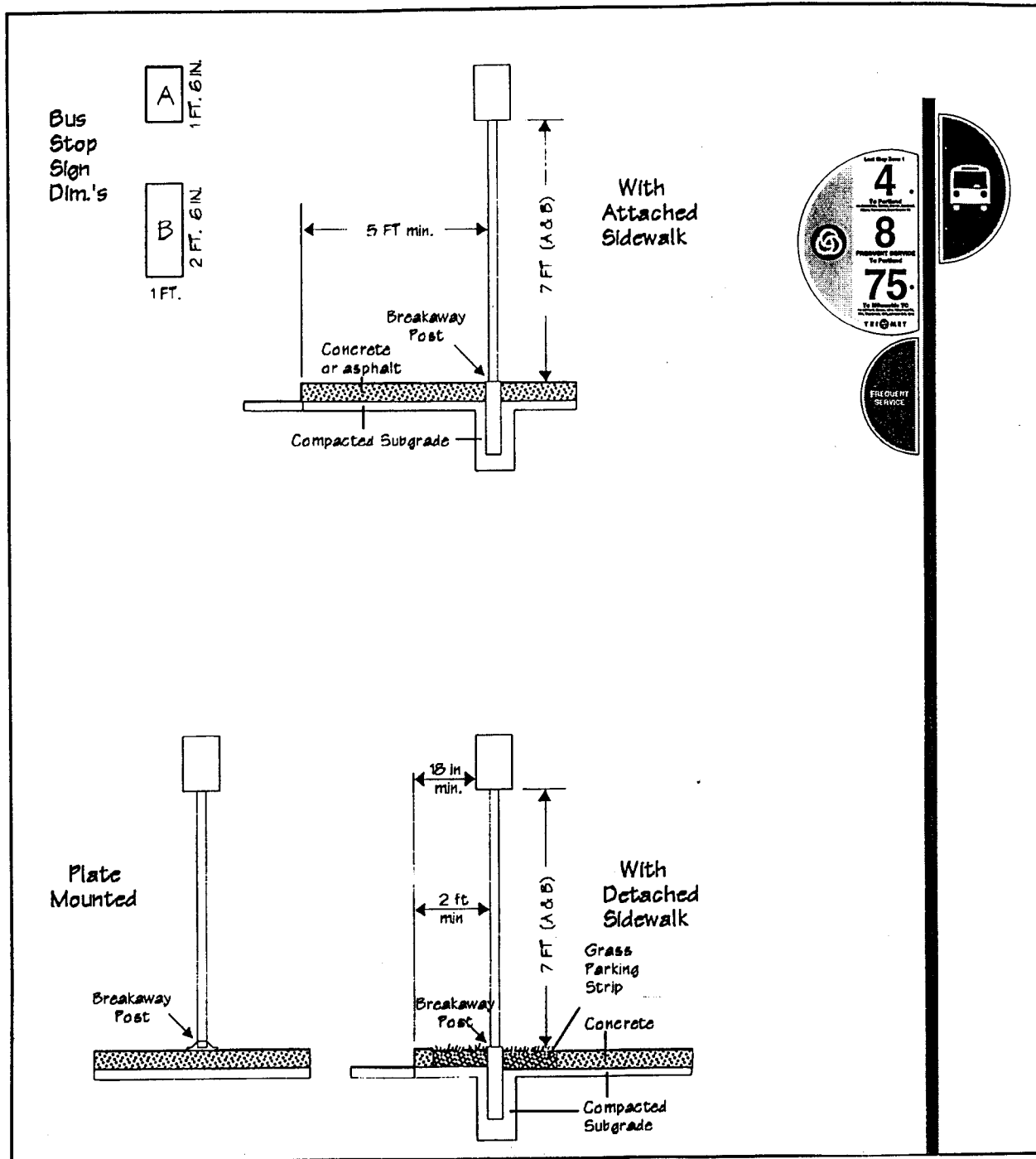
CONSTRUCT CONCRETE SHELTER PAD 4" MIN THICKNESS,  
3000 PSI PCC WITH 2" COMPACTED AGGRERGATE BASE.  
SLOPE TO DRAIN TO CURB (NOT TO EXCEED 2%). CROSS  
SLOPE NOT TO EXCEED 1%.

ADA Landing Pad  
Figure 5

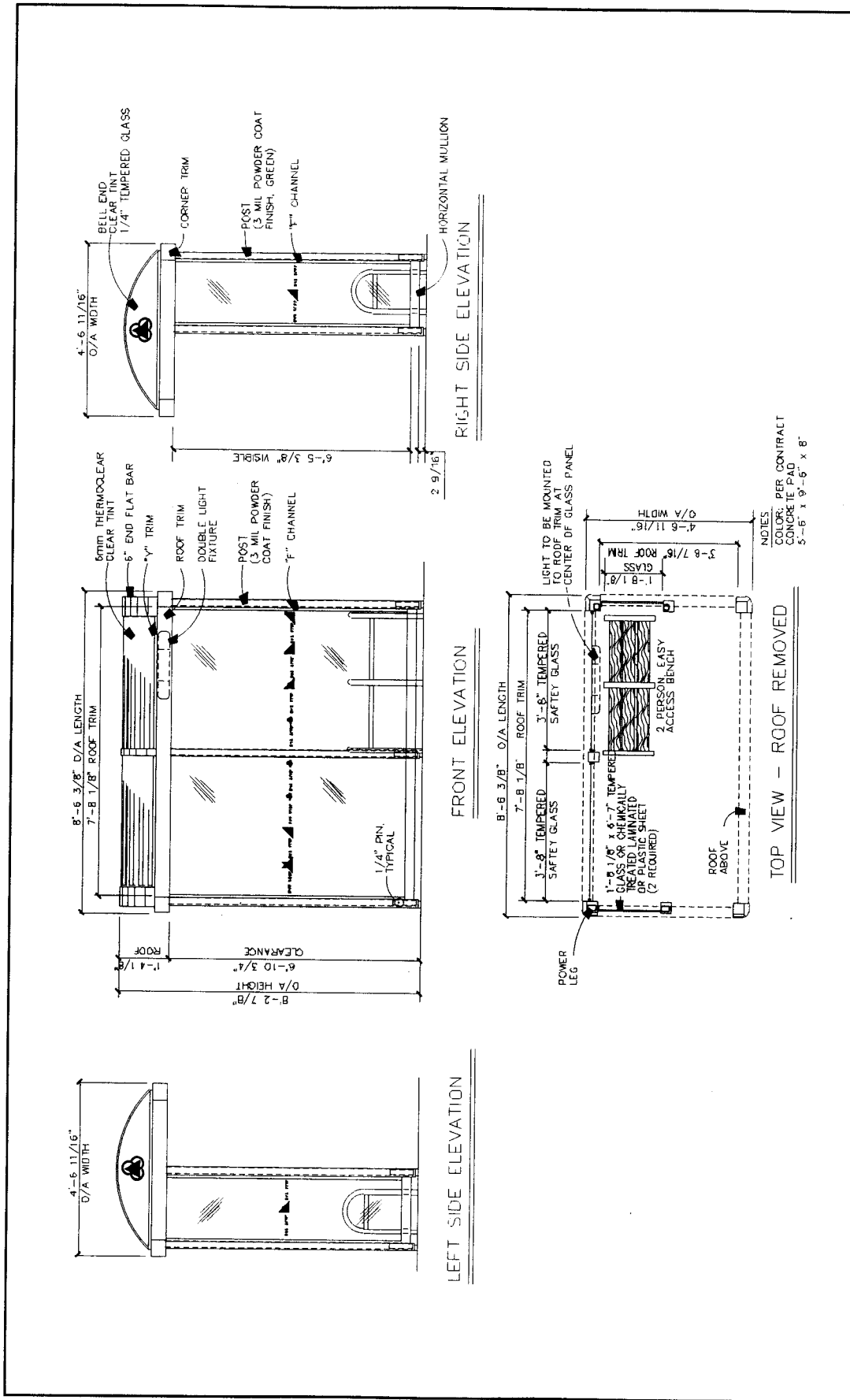


CONSTRUCT CONCRETE WASTE RECEPTACLE PAD 4" MIN. THICKNESS, 3000 PSI PCC WITH 2" COMPACTED AGGRERGATE BASE. SLOPE TO DRAIN TO CURB (NOT TO EXCEED 2%).

Waste Receptacle Pad  
Figure 6



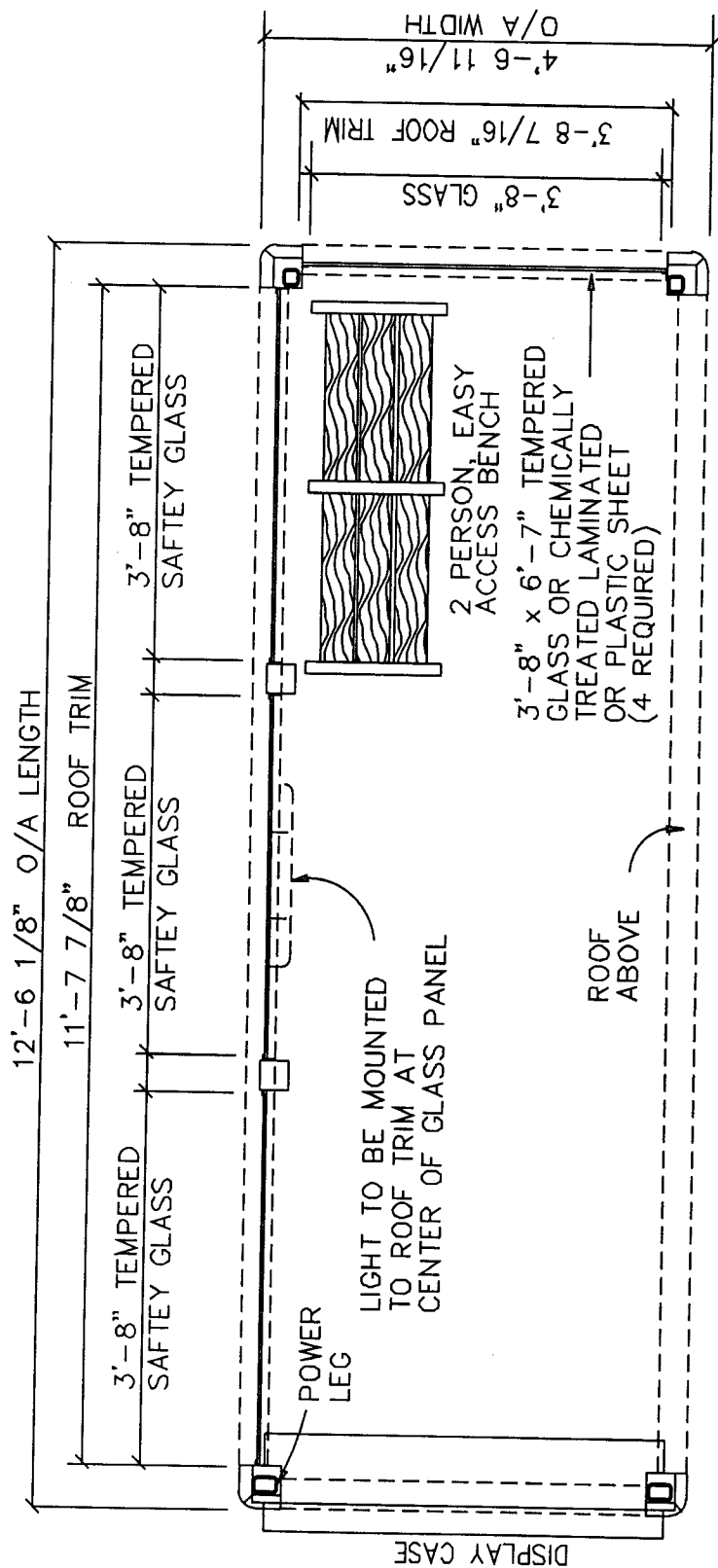
Bus Stop Sign Placement  
Figure 7



Type A Shelter Without Display  
Figure 8

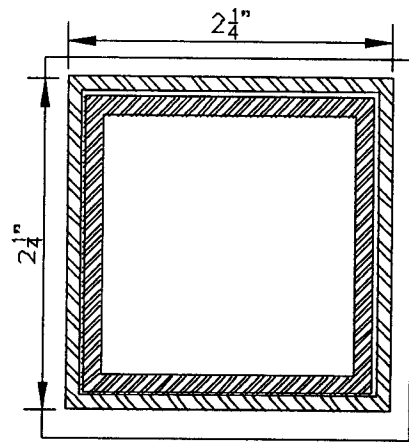
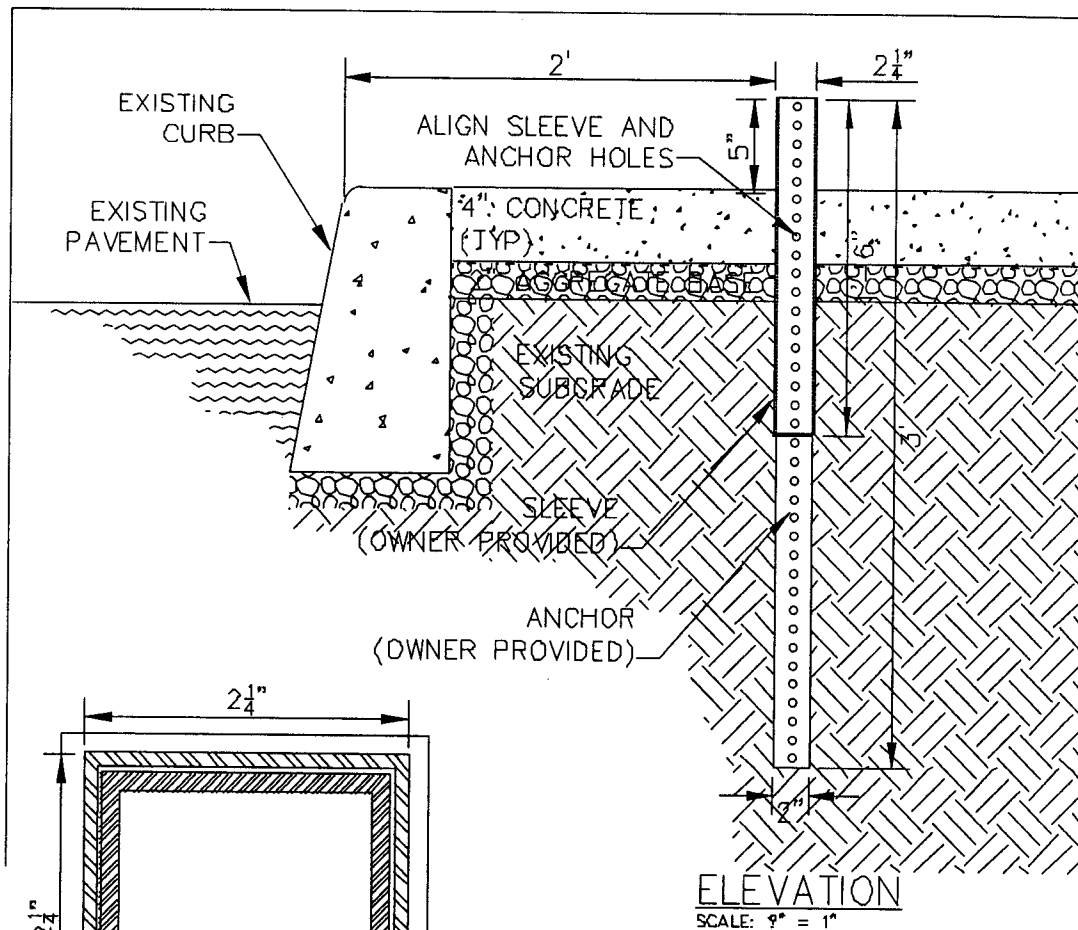






TOP VIEW - ROOF REMOVED

TType "BX" Shelter Without Display  
Figure 10

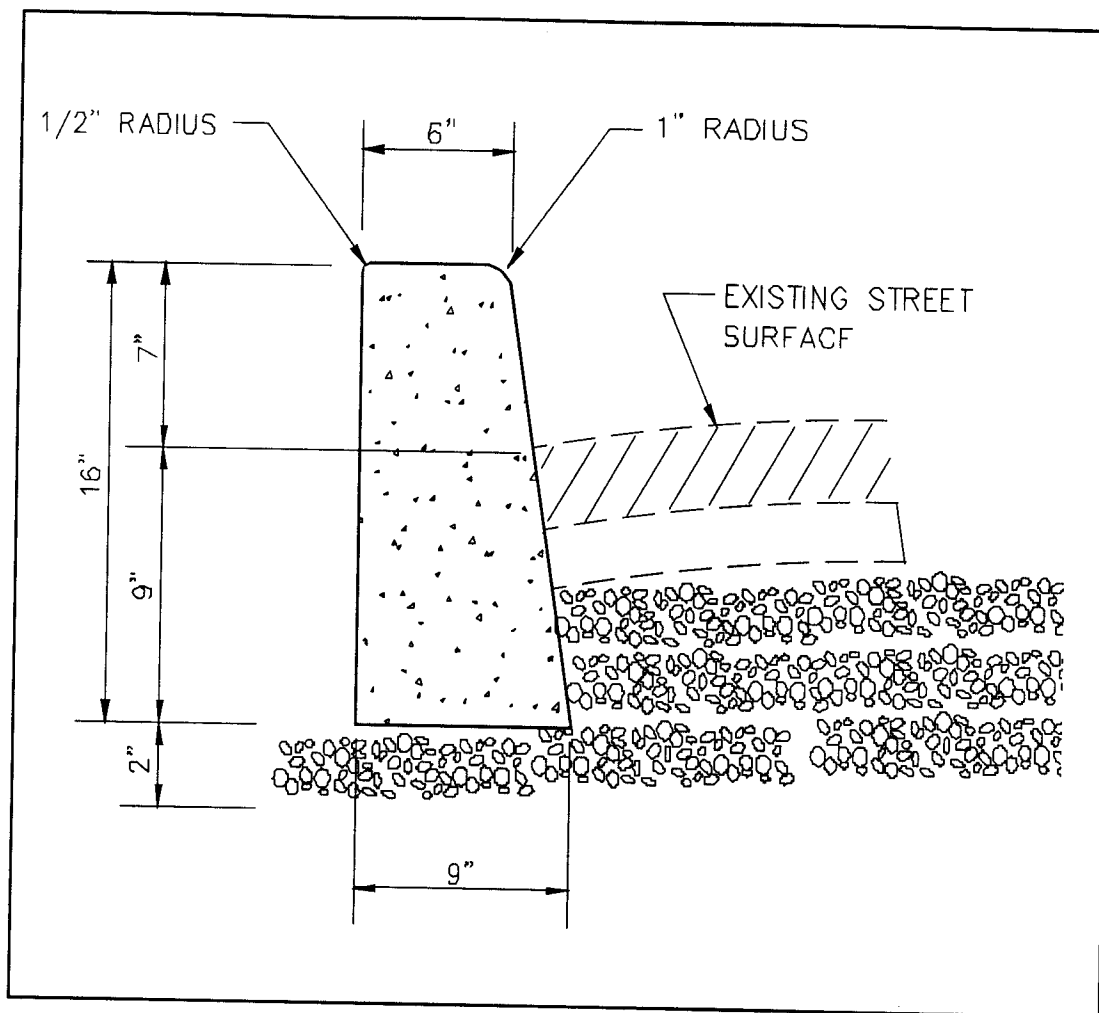


**PLAN**  
SCALE: 1" = 1'

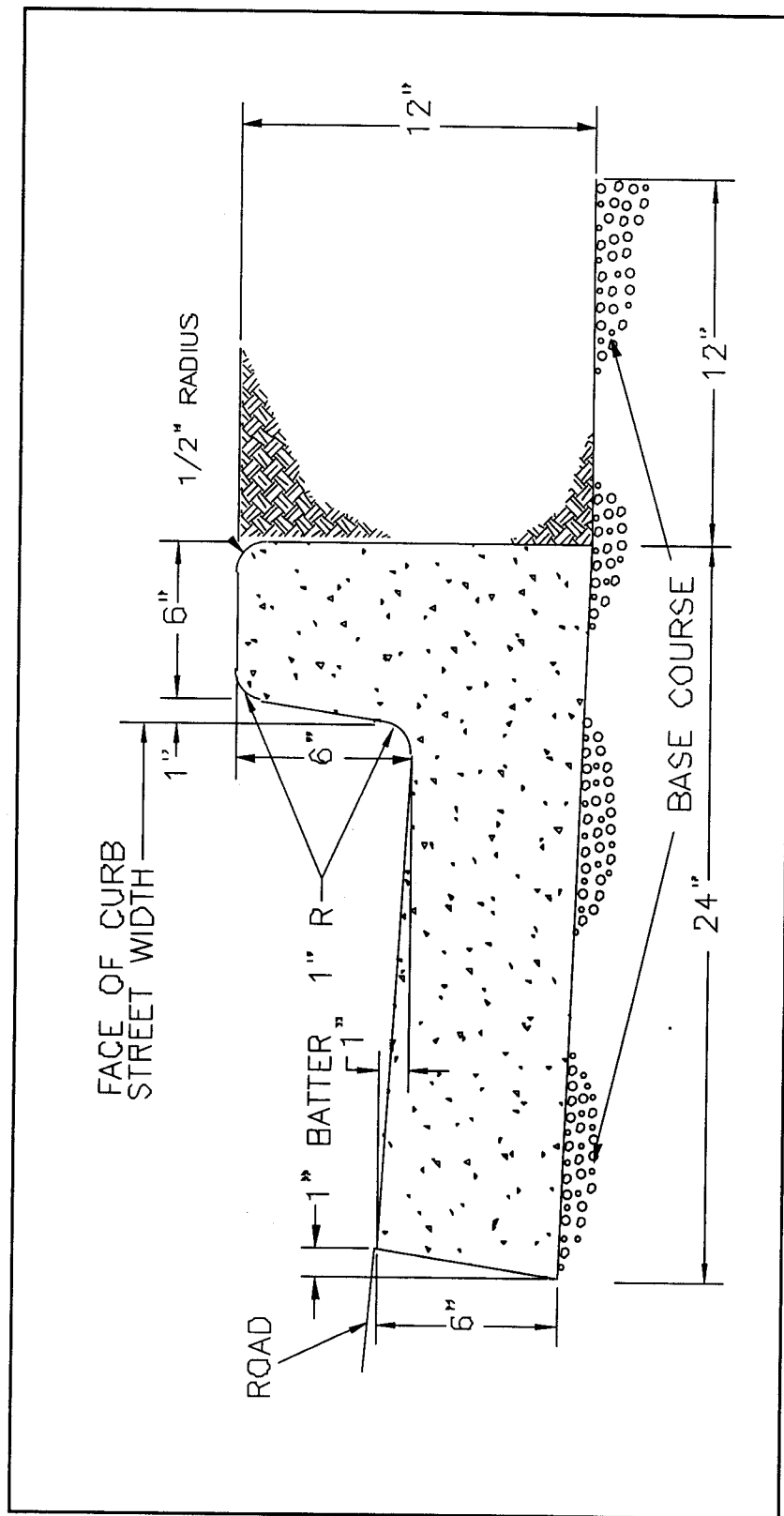
**ELEVATION**  
SCALE: 1" = 1'

- NOTES:**
1. CONTACT DIANA ANDERSON AT (503) 962-4892 TO OBTAIN ANCHOR AND SLEEVE.
  2. EXCAVATE AND INSTALL ANCHOR AND SLEEVE PRIOR TO CONCRETE PLACEMENT.
  3. TIGHTLY WRAP ANCHOR AND SLEEVE WITH VISQUEEN PRIOR TO INSTALLATION.

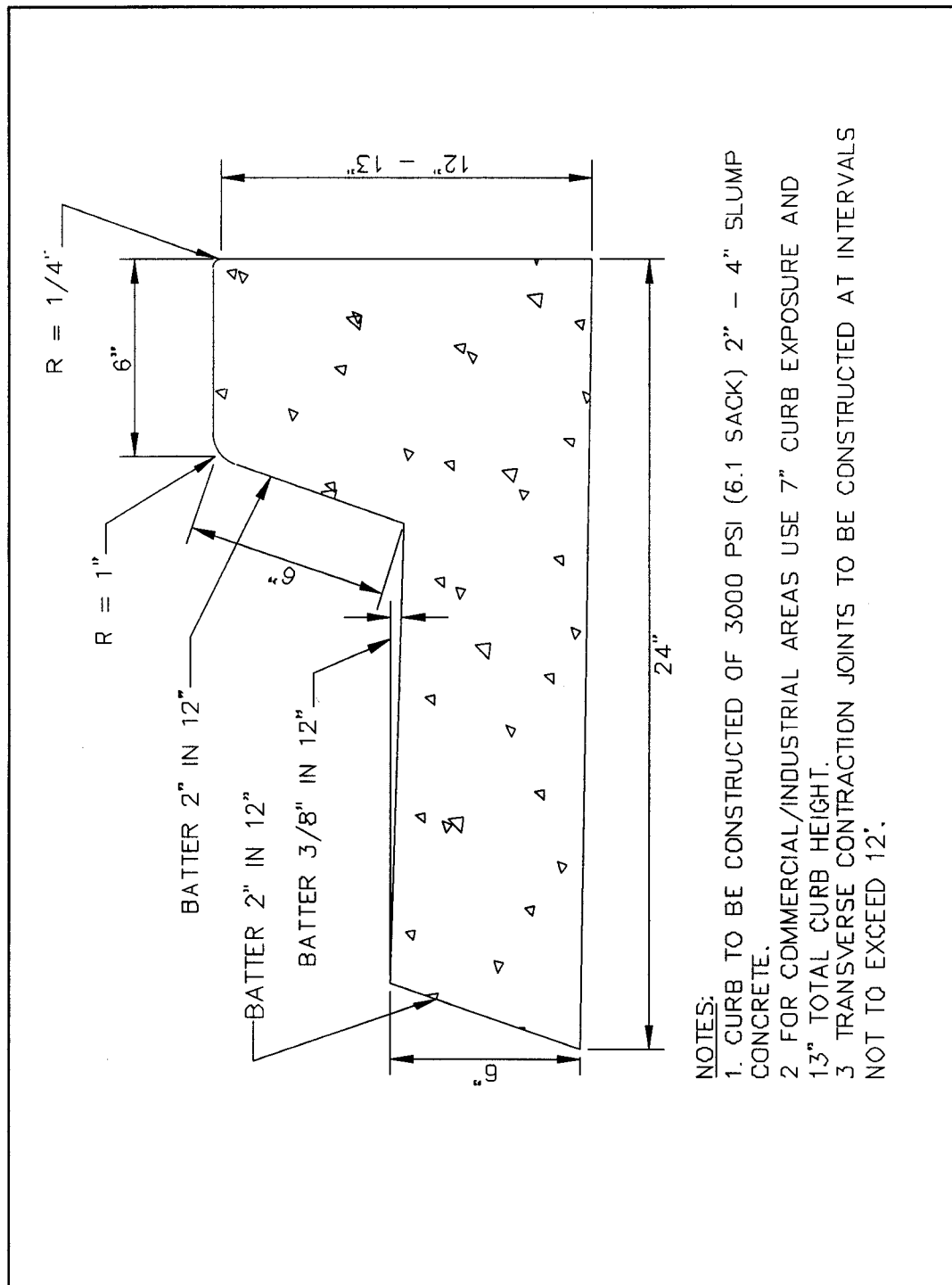
**Pole Anchor & Sleeve**  
**Figure 11**



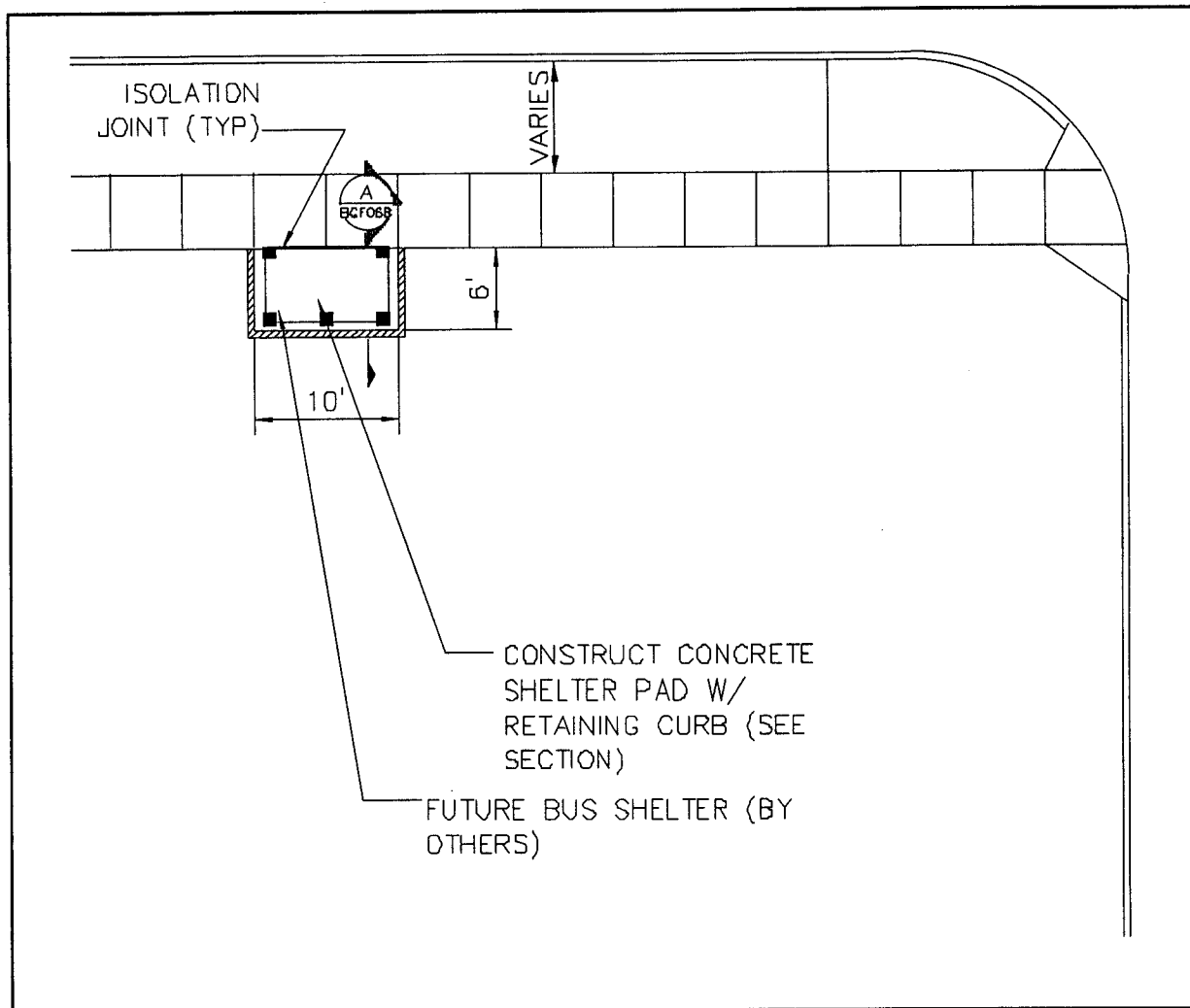
6" Curb  
Figure 12



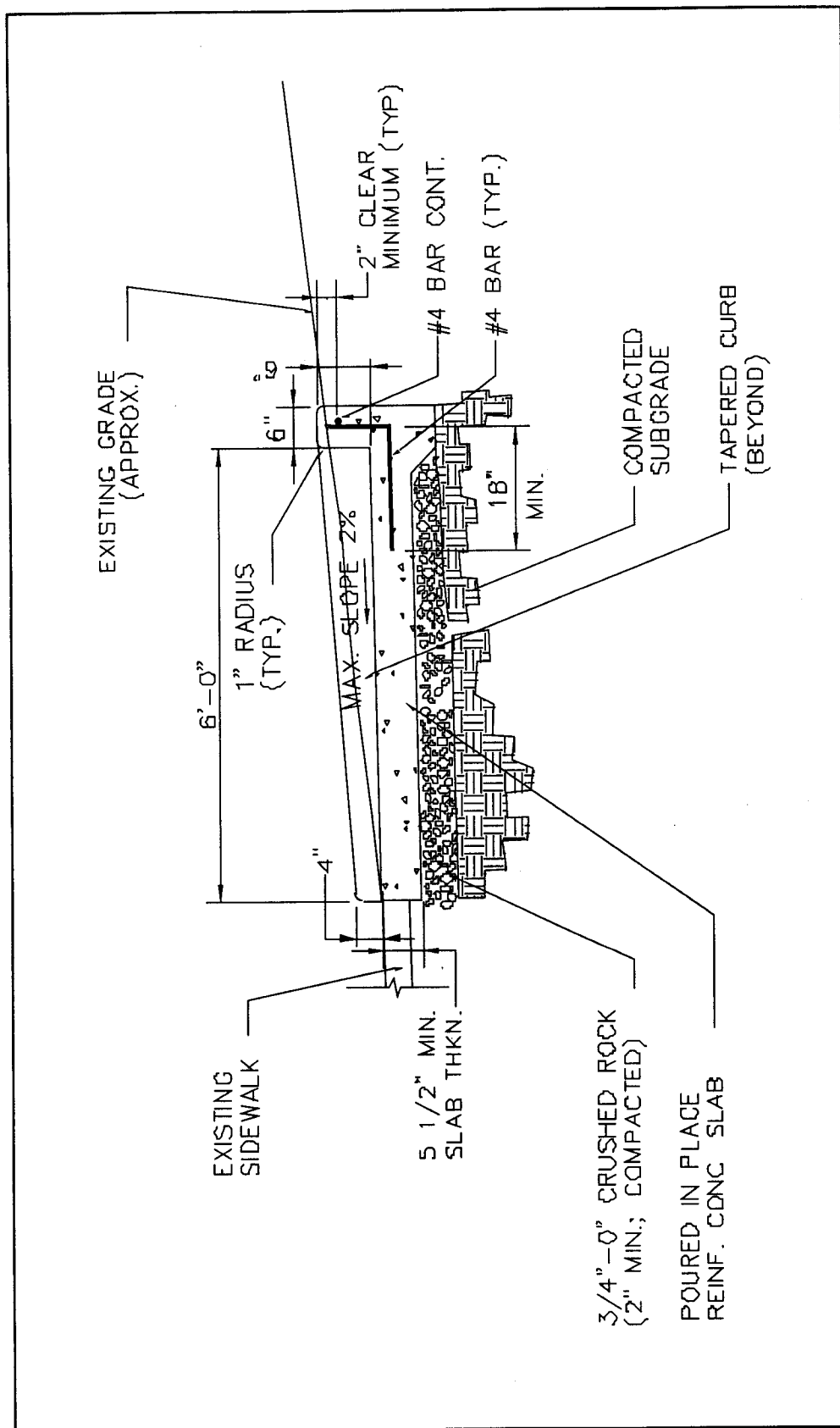
24" Curb & Gutter  
 Figure 13



24" Combination Curb & Gutter  
Figure 14

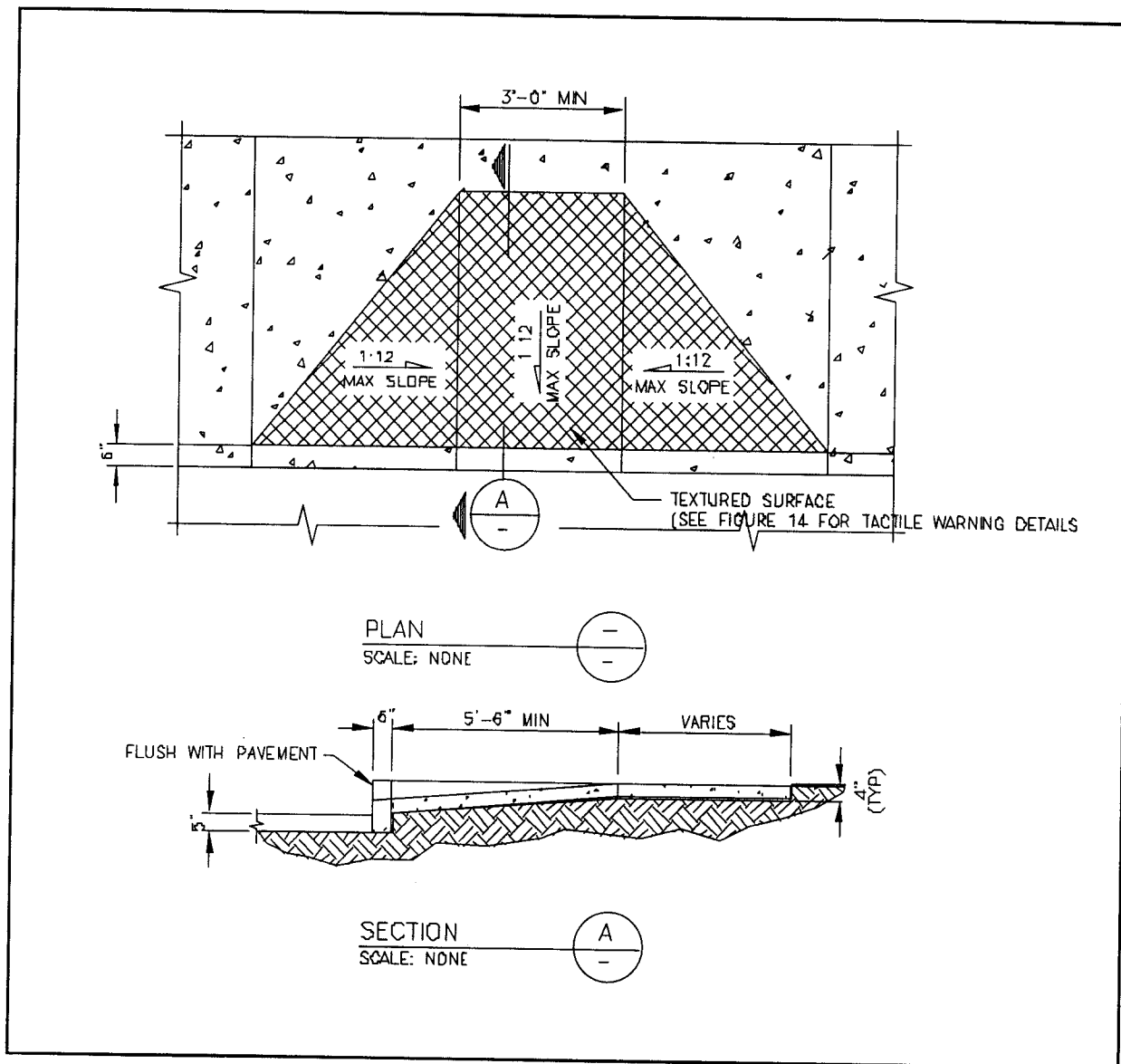


Retaining Curb  
Figure 15

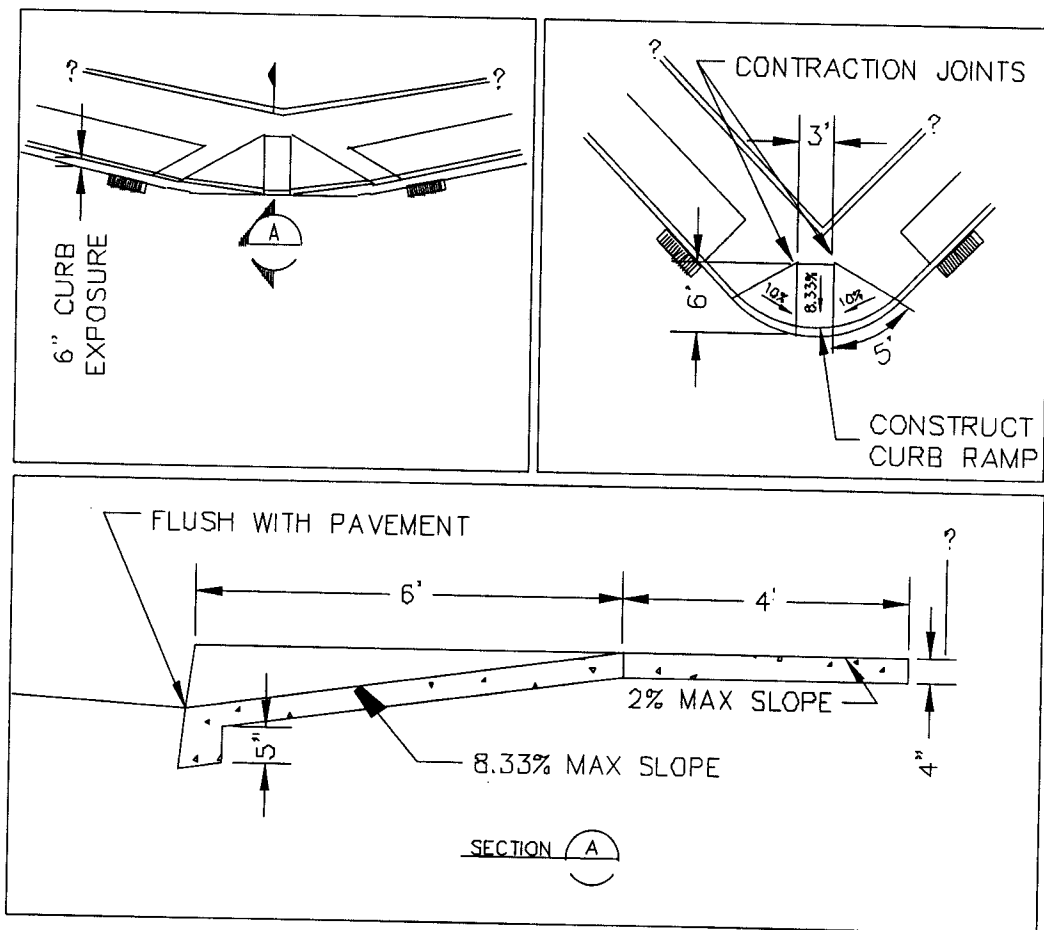


Retaining Curb  
 Figure 16



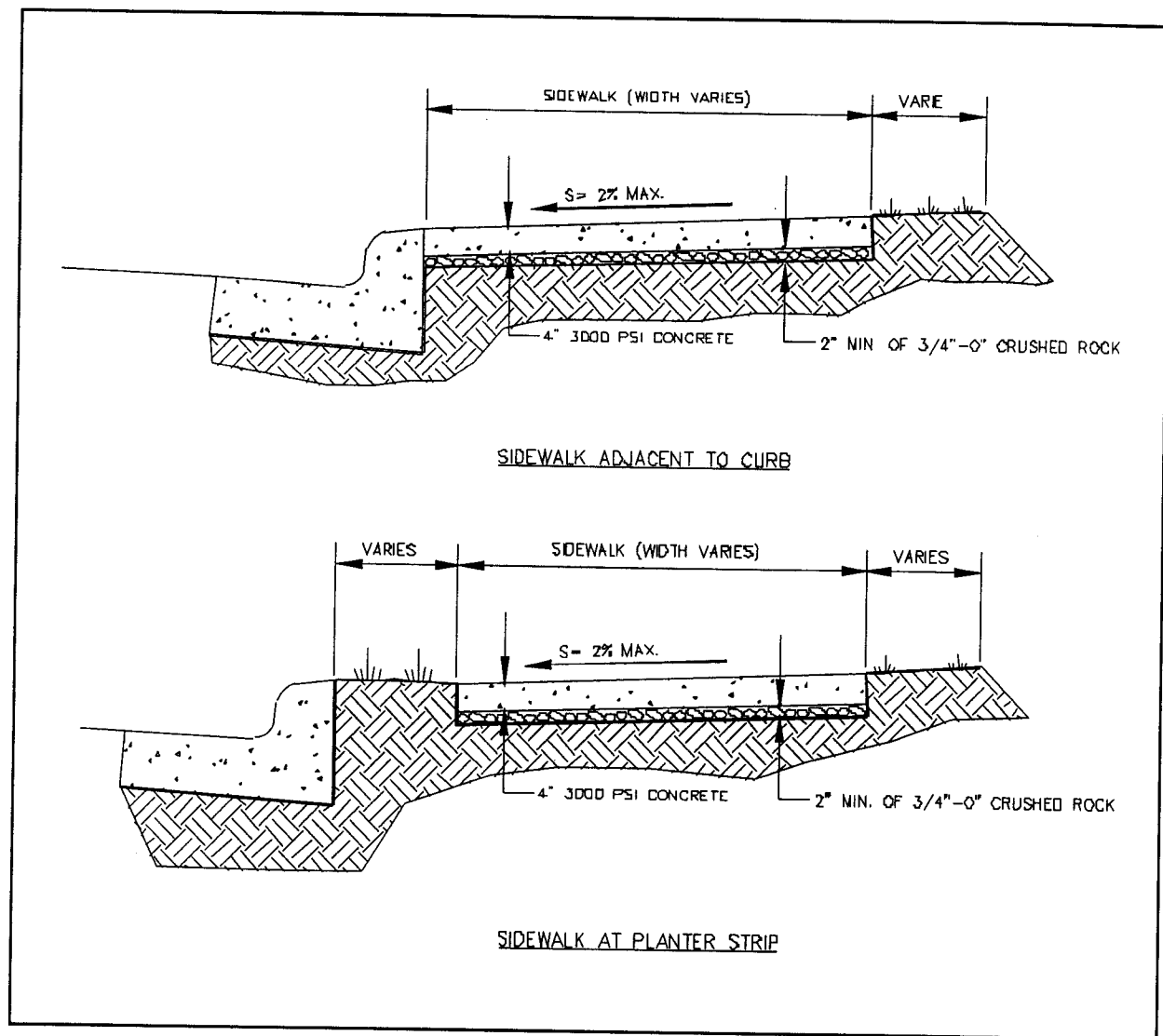


Curb Ramp  
Figure 17

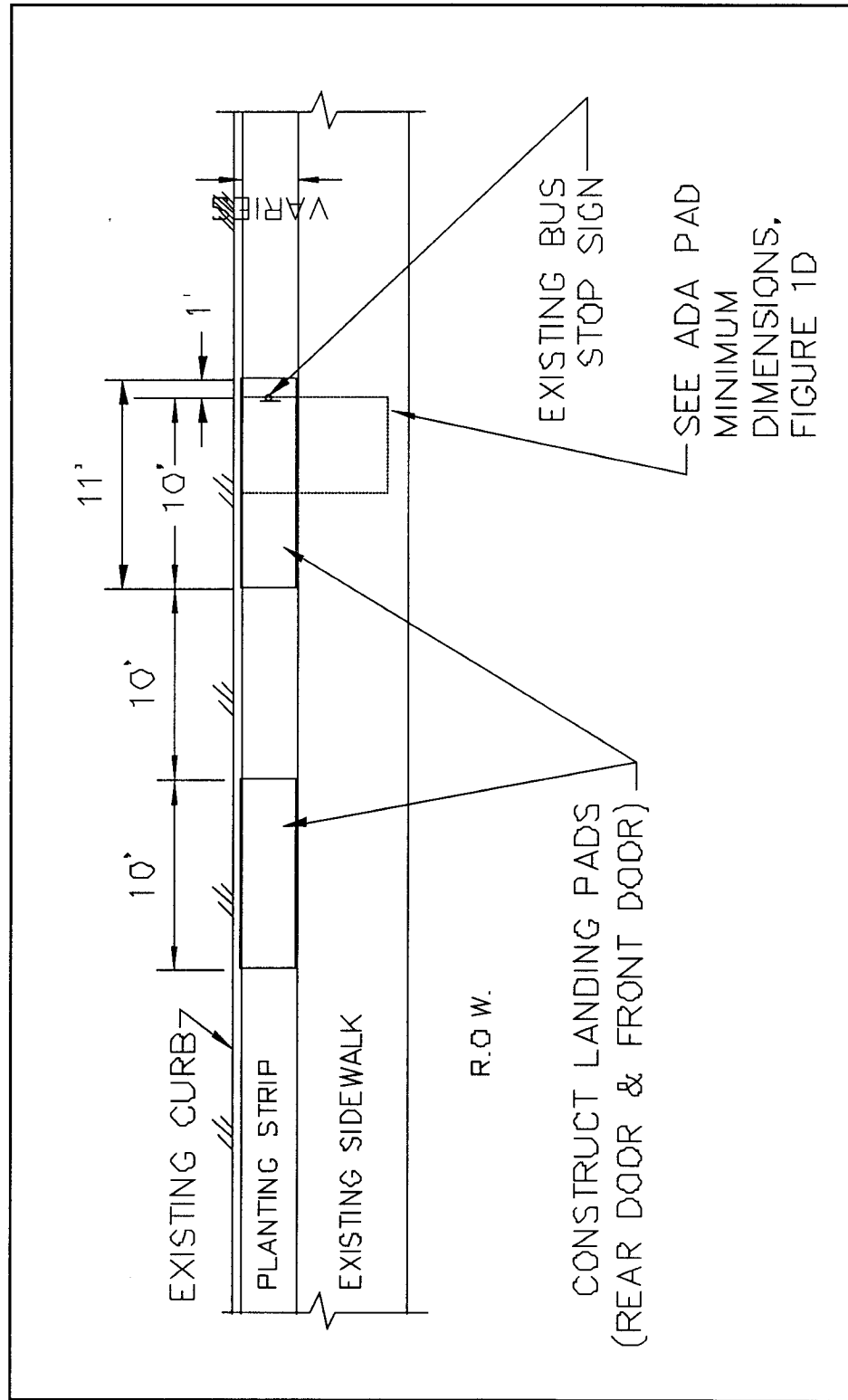


1. PROVIDE BROOM TEXTURE AND DIAMOND TEXTURE ON RAMP AS REQUIRED BY LOCAL JURISDICTION.
2. USE 3000 PSI CONCRETE WITH 2" TO 4" SLUMP.
3. SAWCUT A MINIMUM OF 2' FROM CURBFACE AND REPLACE PAVEMENT SECTION WITH CLASS 'B' AC IN 2" LIFTS TO MATCH EXISTING.
4. PLACE CONTRACTION JOINTS AS SHOWN ABOVE

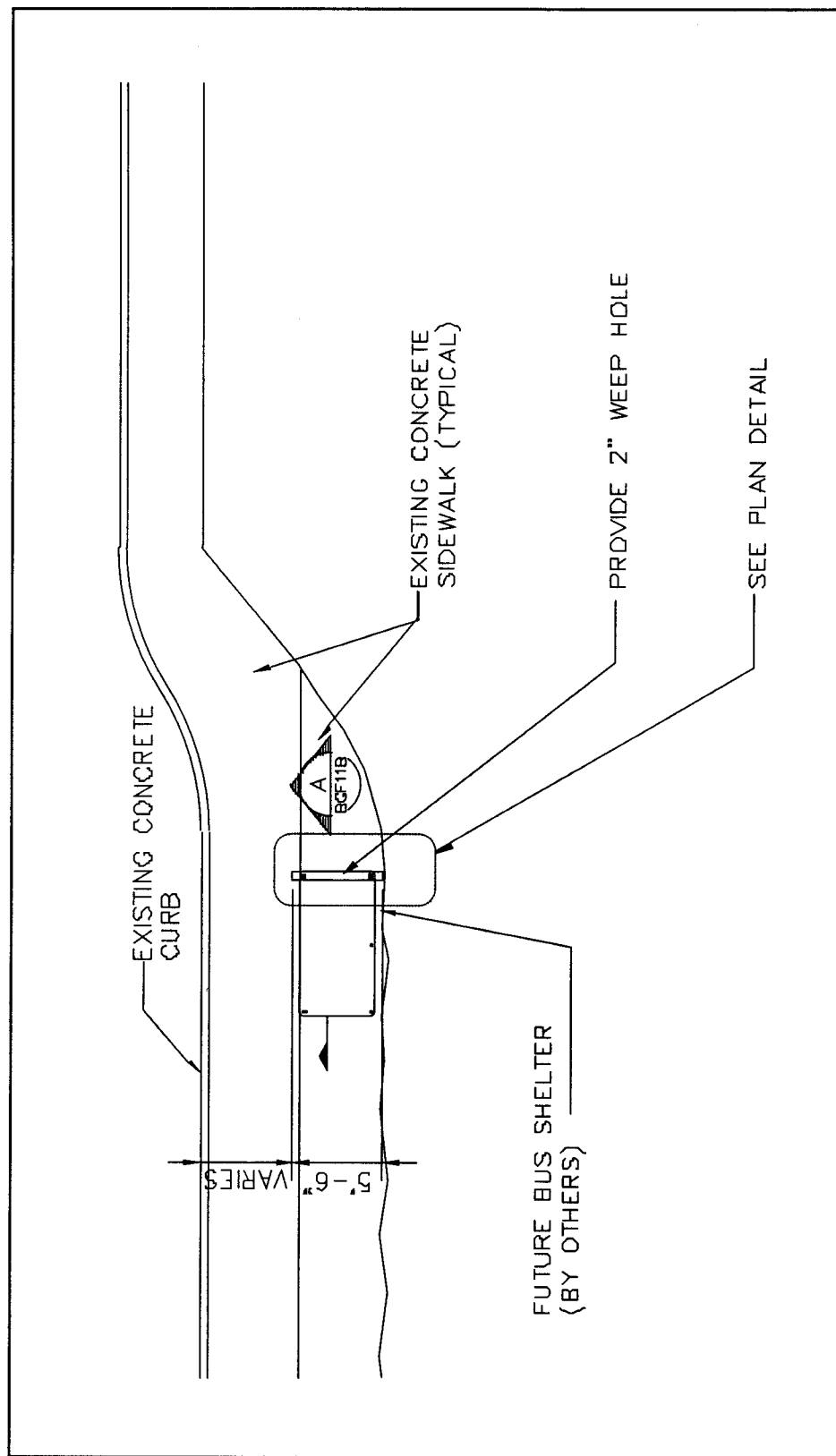
Diagonal Curb Ramp  
Figure 18



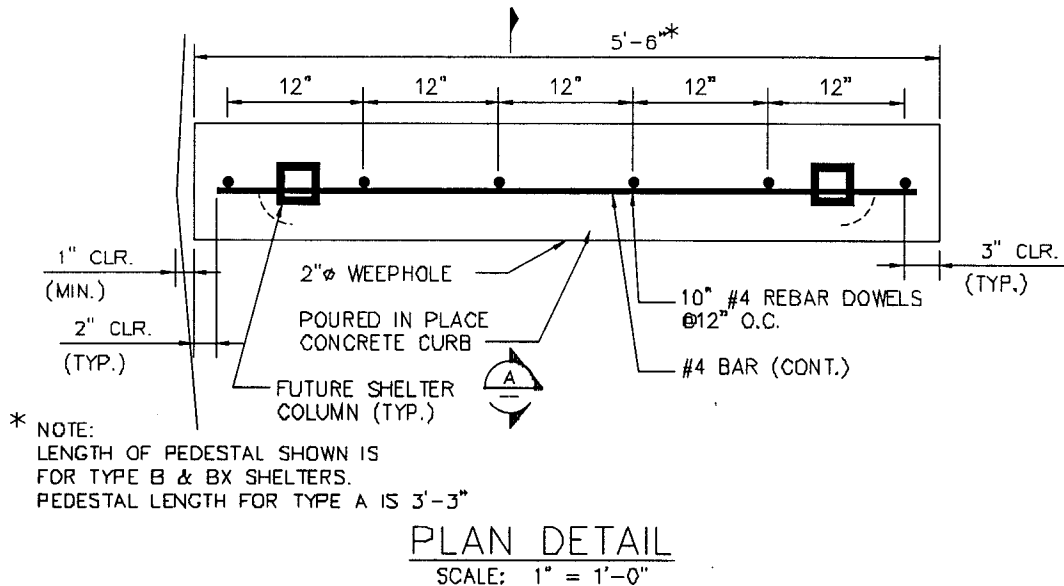
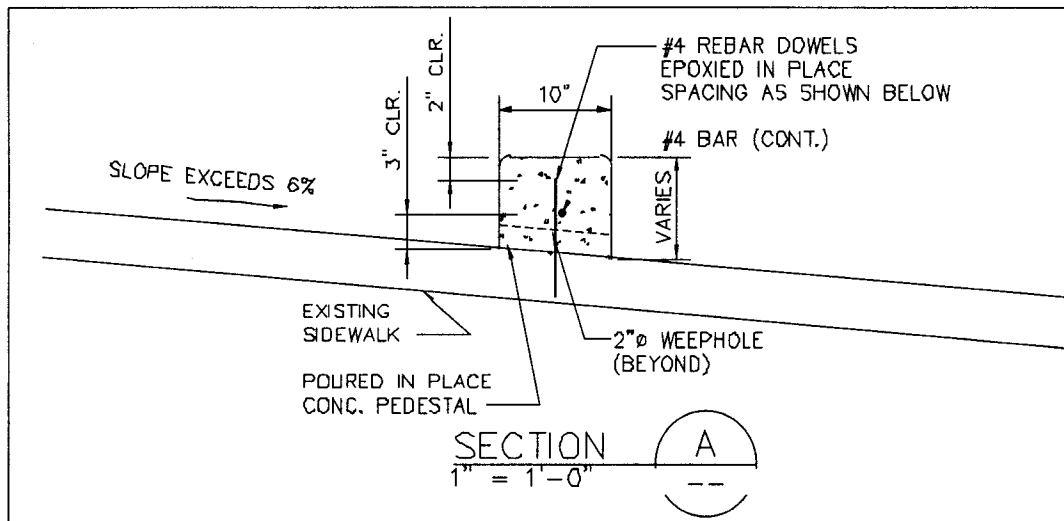
4" Sidewalk  
Figure 19



Front & Rear Door Landing Pads  
 Figure 20

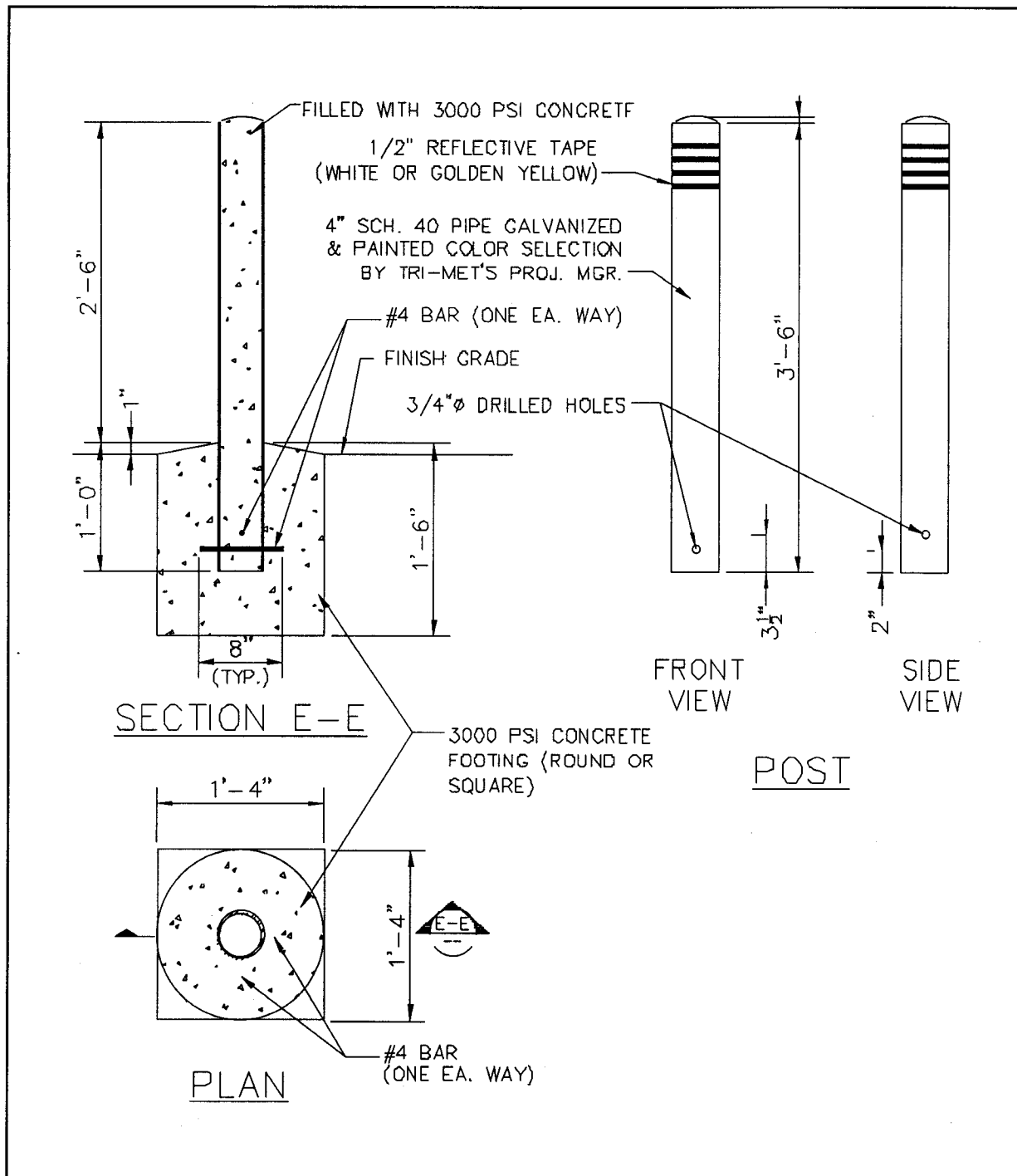


Leveling Pedestal  
Figure 21



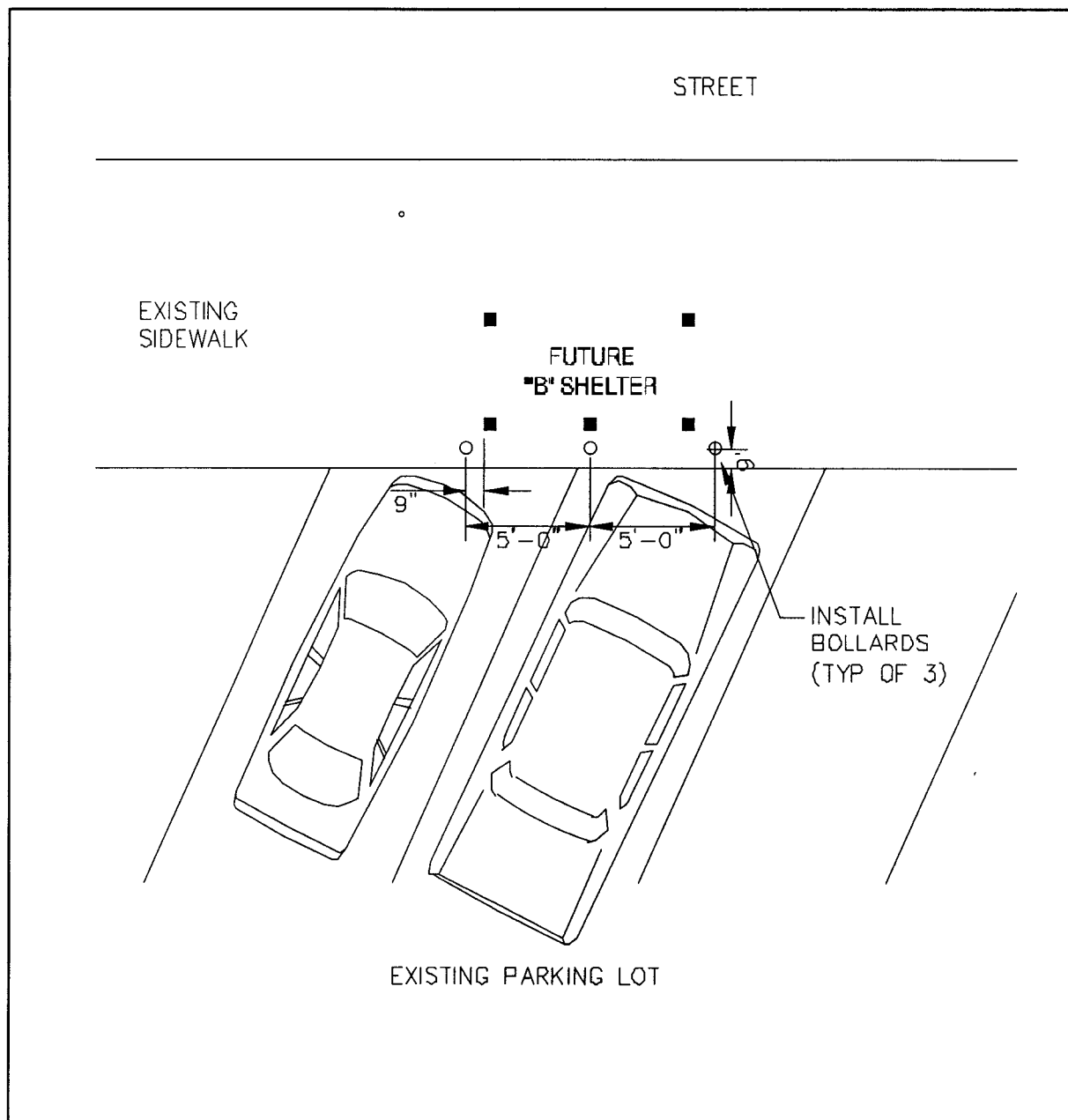
\* NOTE:  
 LENGTH OF PEDESTAL SHOWN IS  
 FOR TYPE B & BX SHELTERS.  
 PEDESTAL LENGTH FOR TYPE A IS 3'-3"

Leveling Pedestal  
 Figure 22

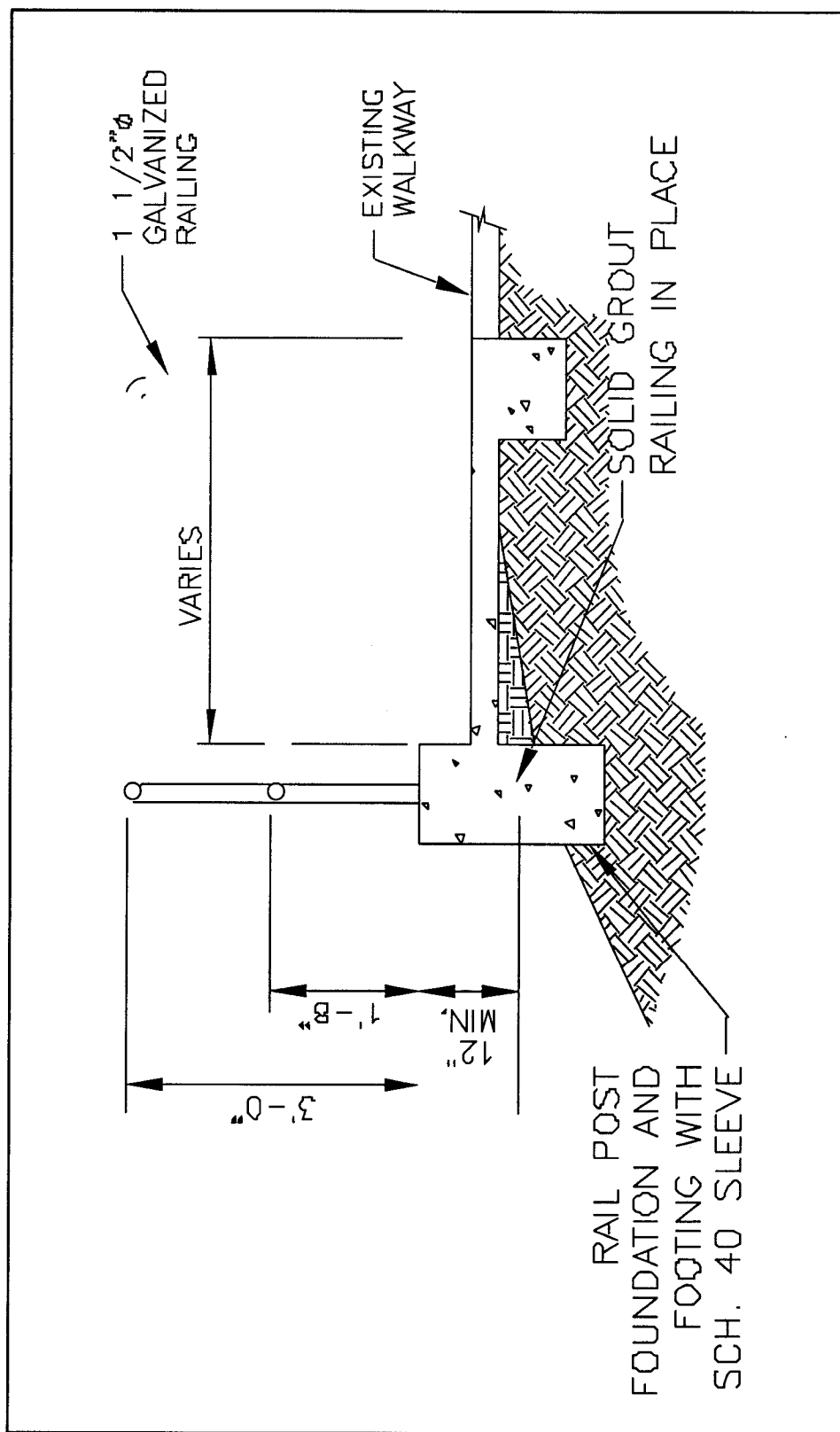


Bollard  
 Figure 23

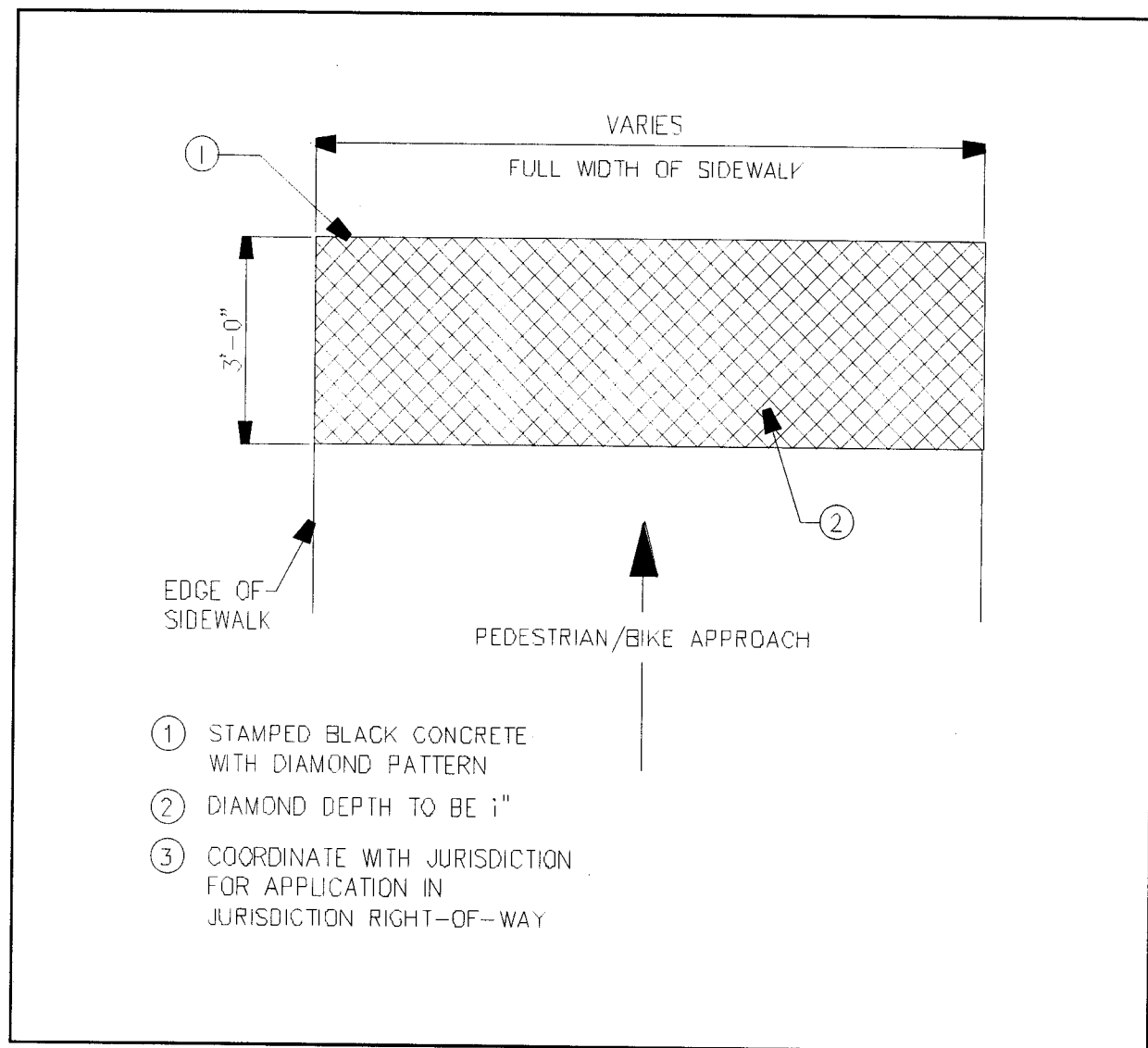




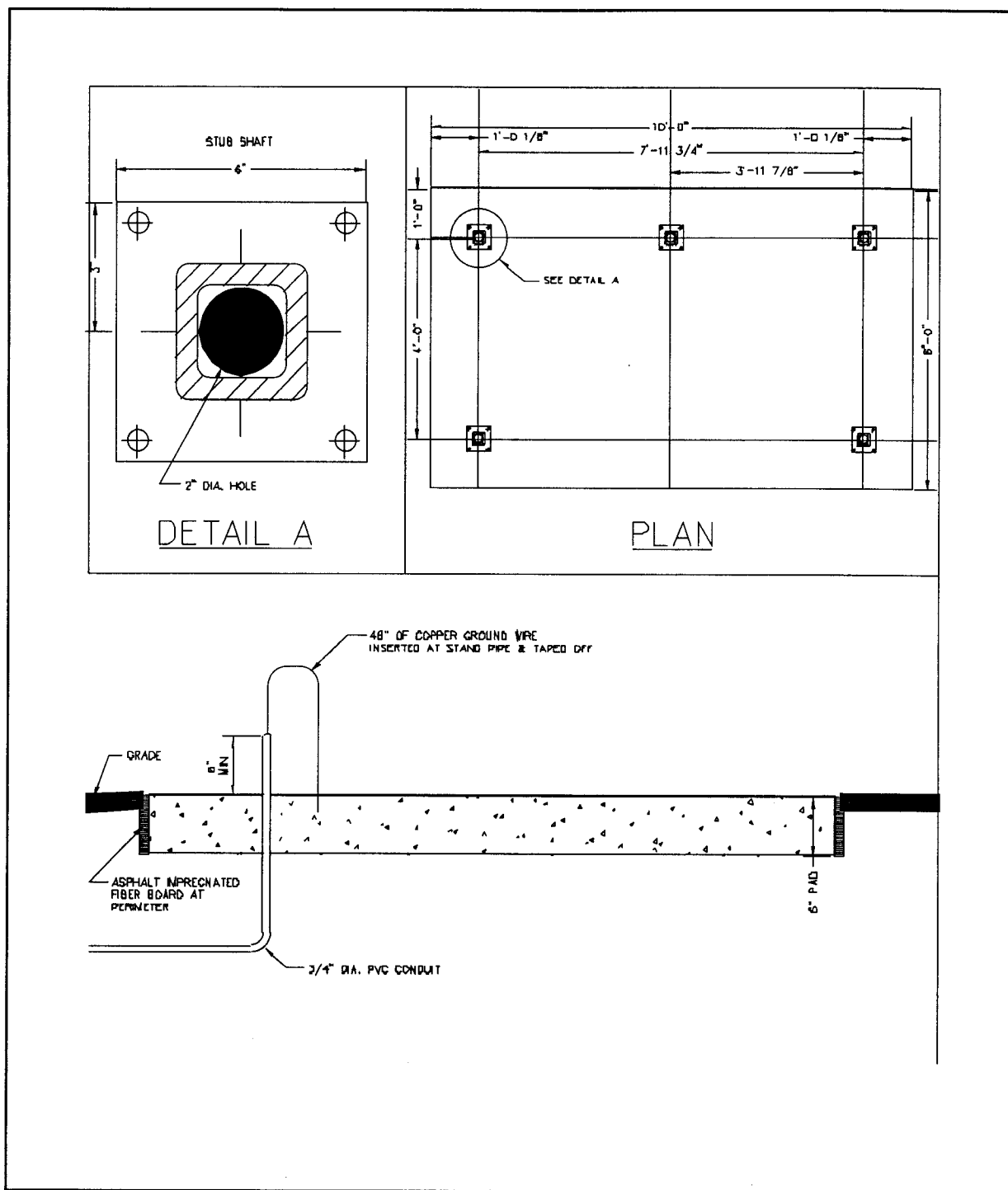
Bollard Installation  
Figure 24



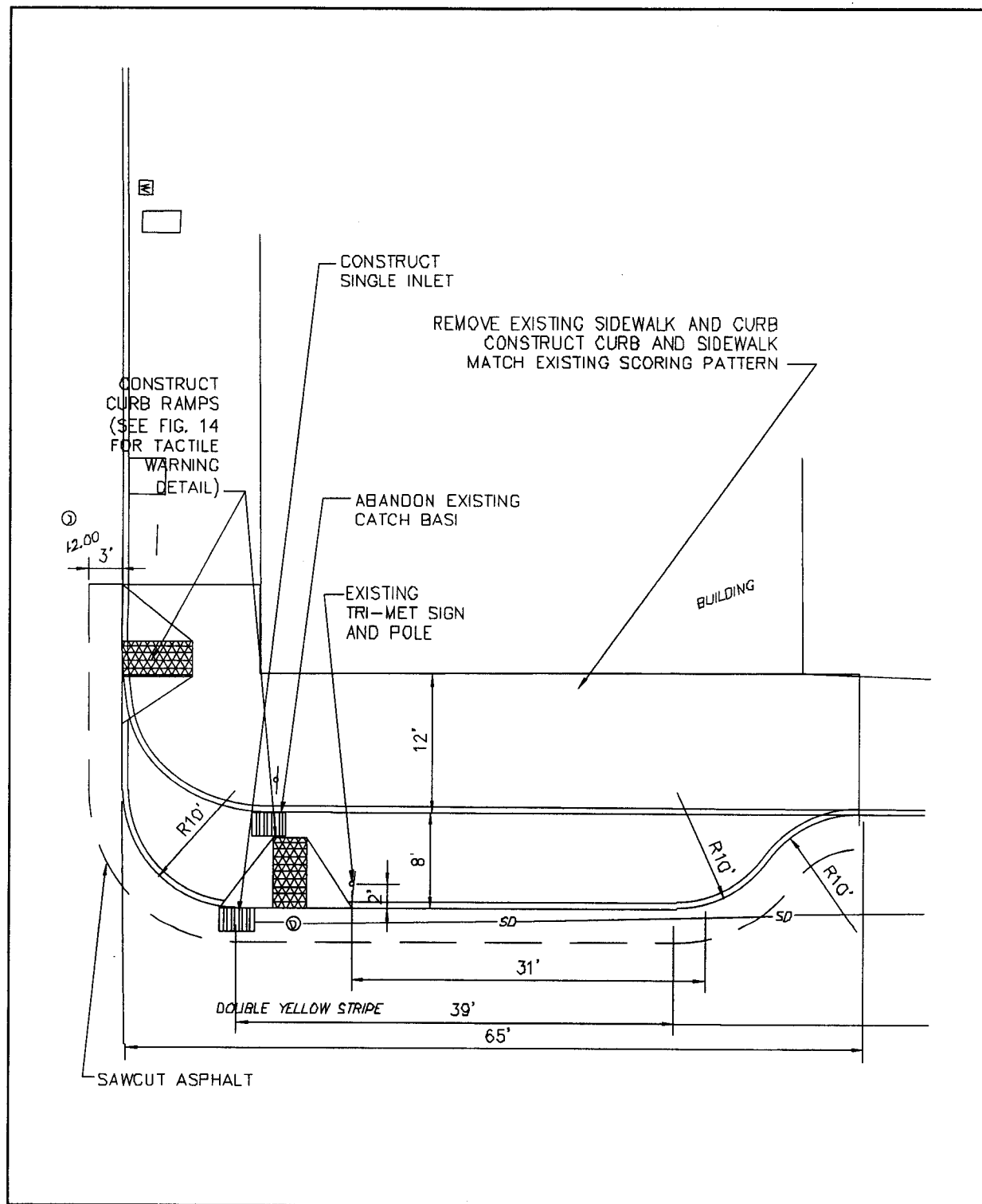
Railing  
 Figure 25



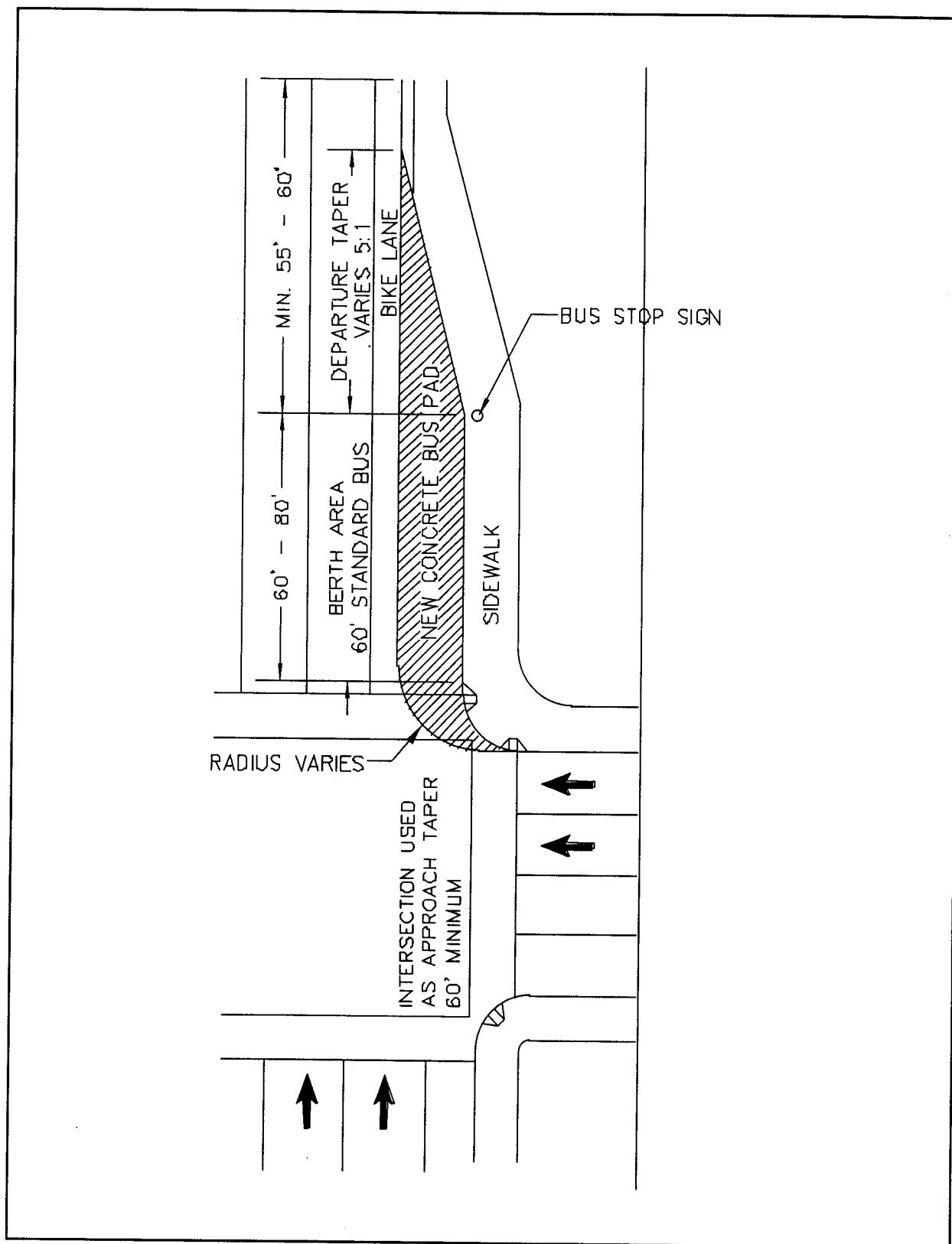
Tactile Warning  
Figure 26



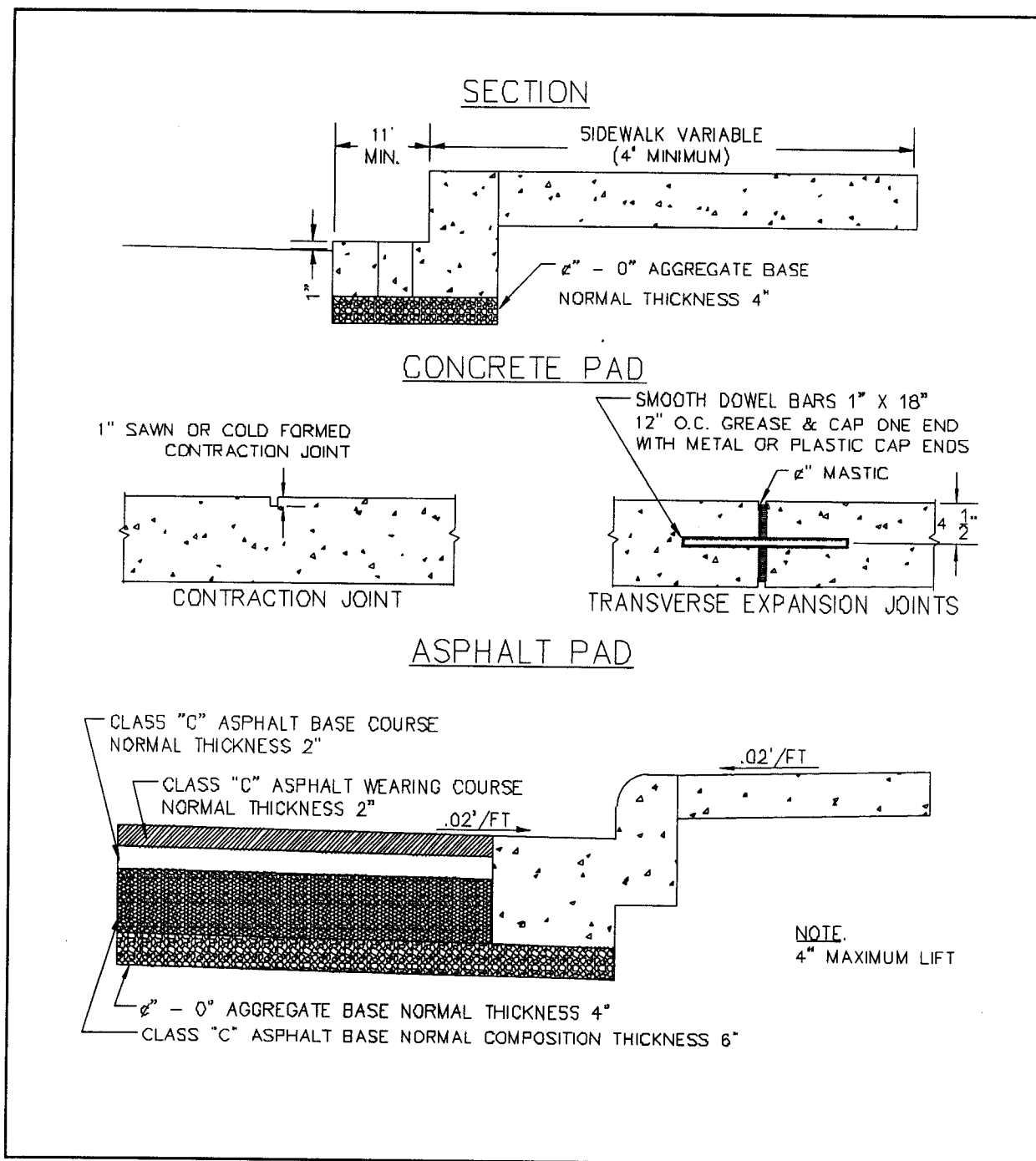
Shelter Pad Conduit Location  
Figure 27



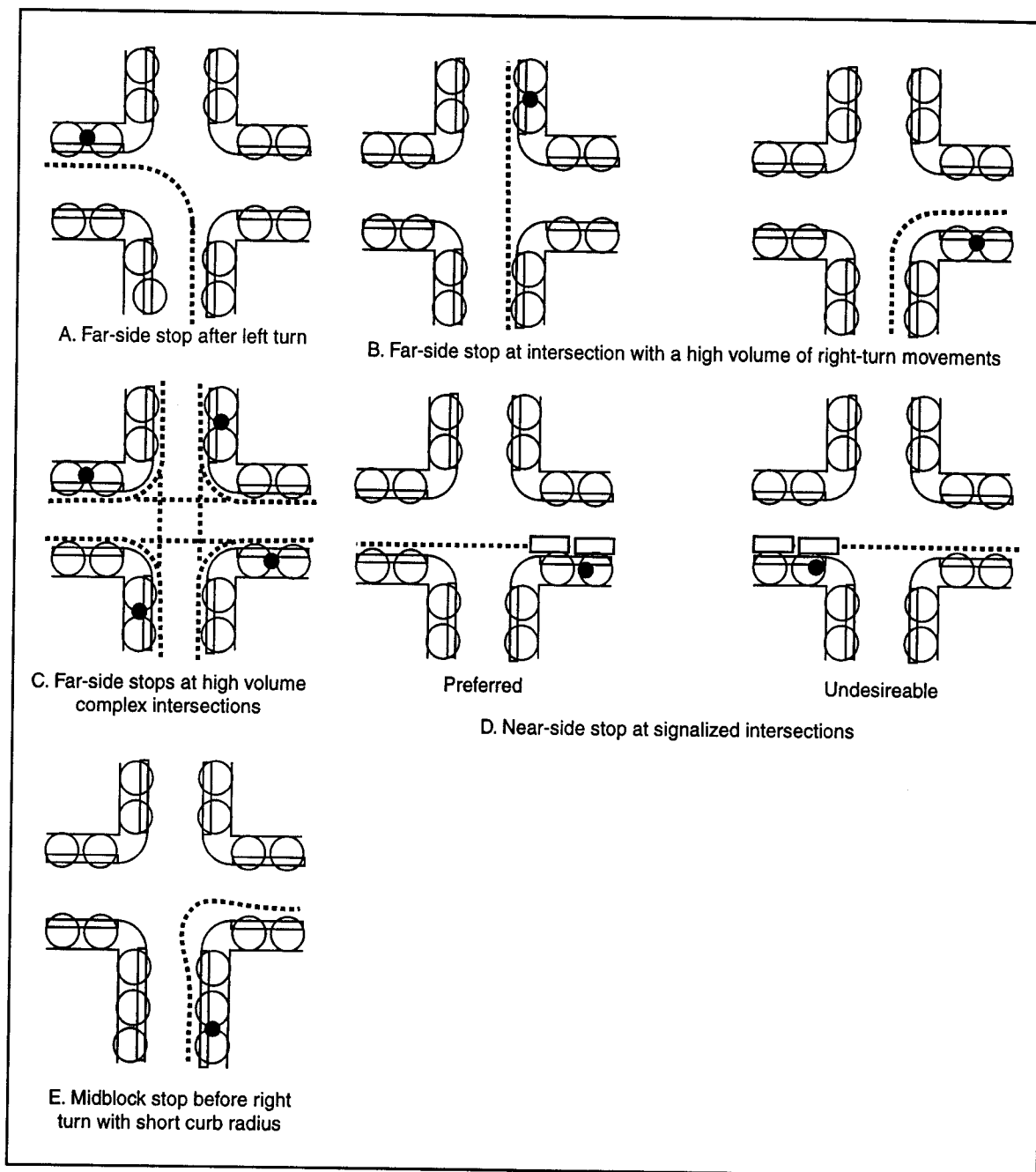
Full Curb Extension  
Figure 28



Bus Pull Out & Bus Pad  
 Figure 29



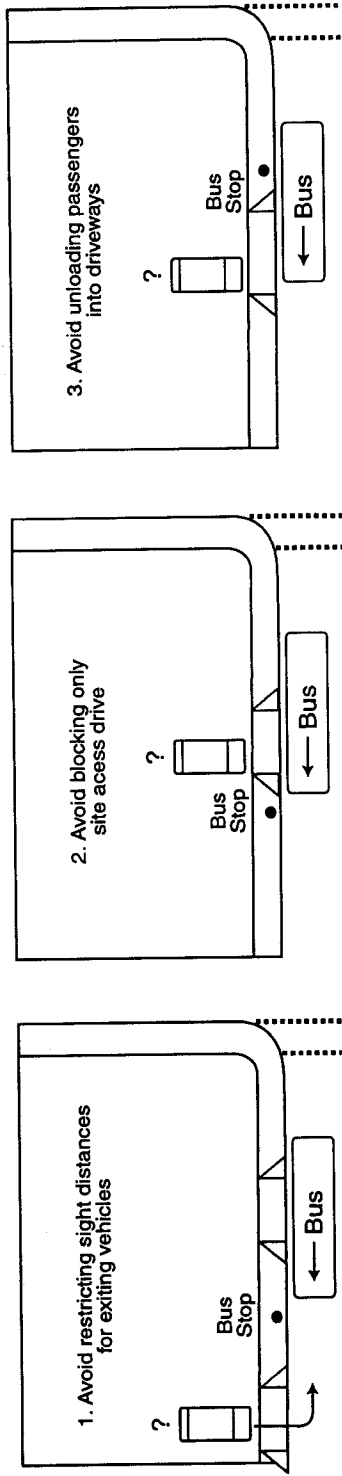
Bus Pad Section  
Figure 30



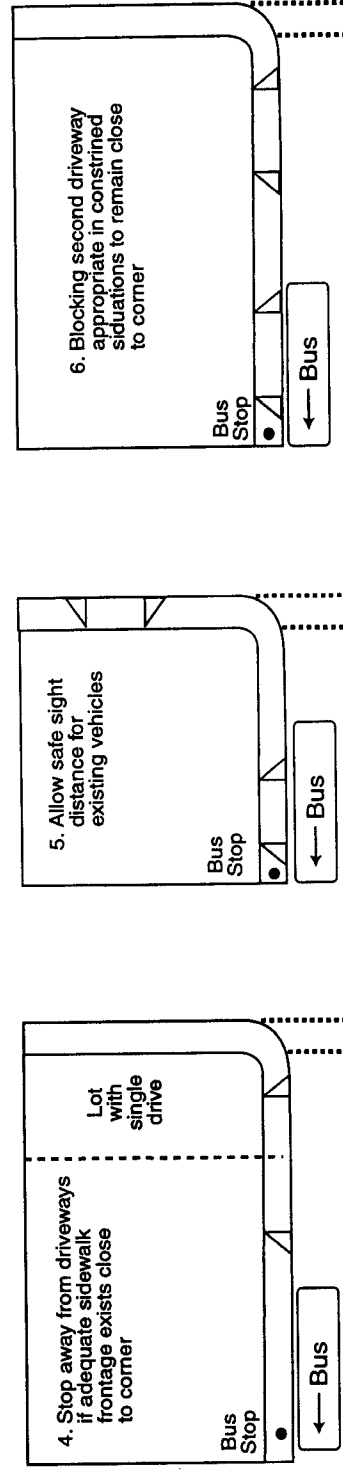
Stop Locations  
Figure 31



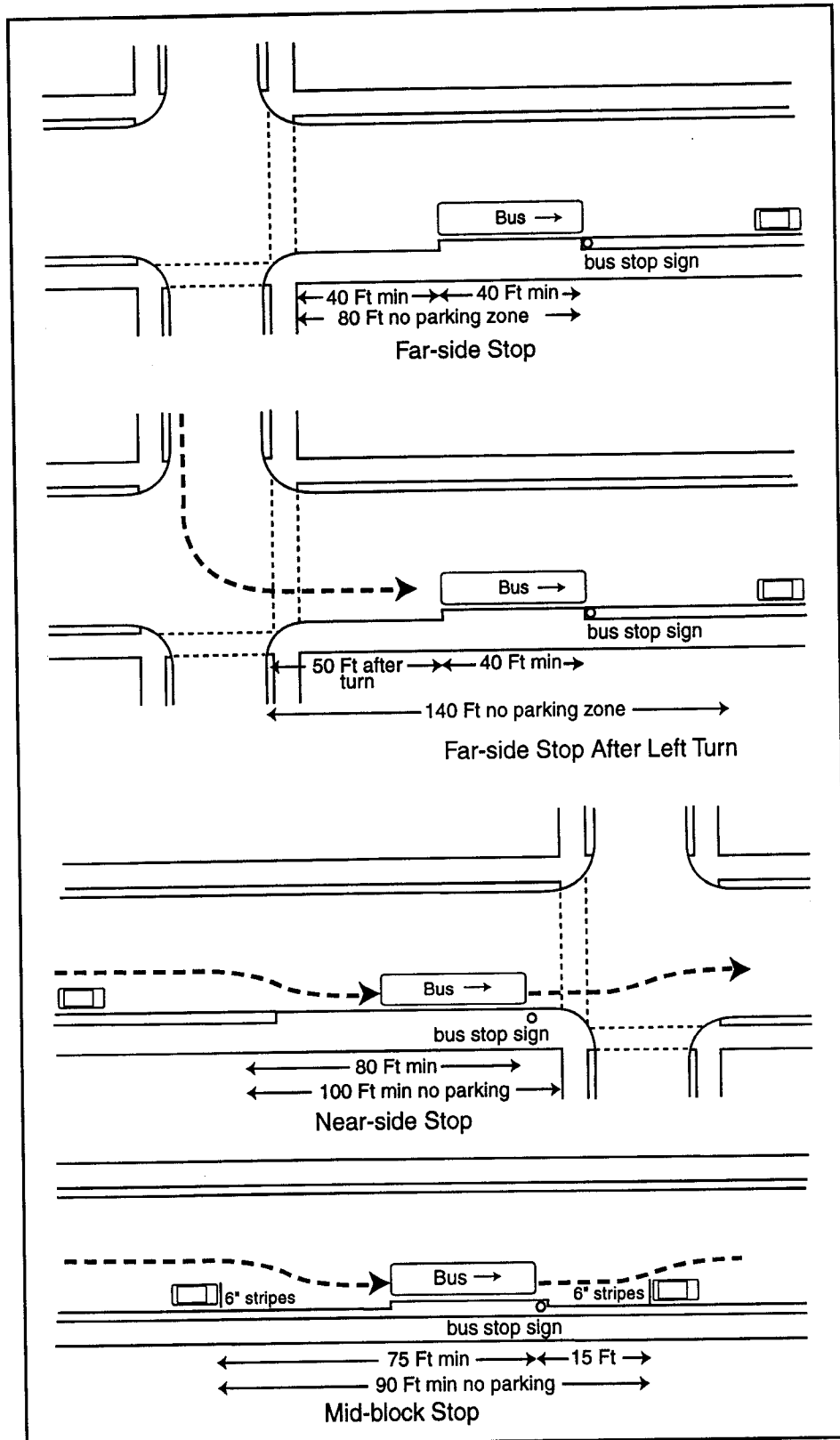
### Undesirable Driveway Arrangements



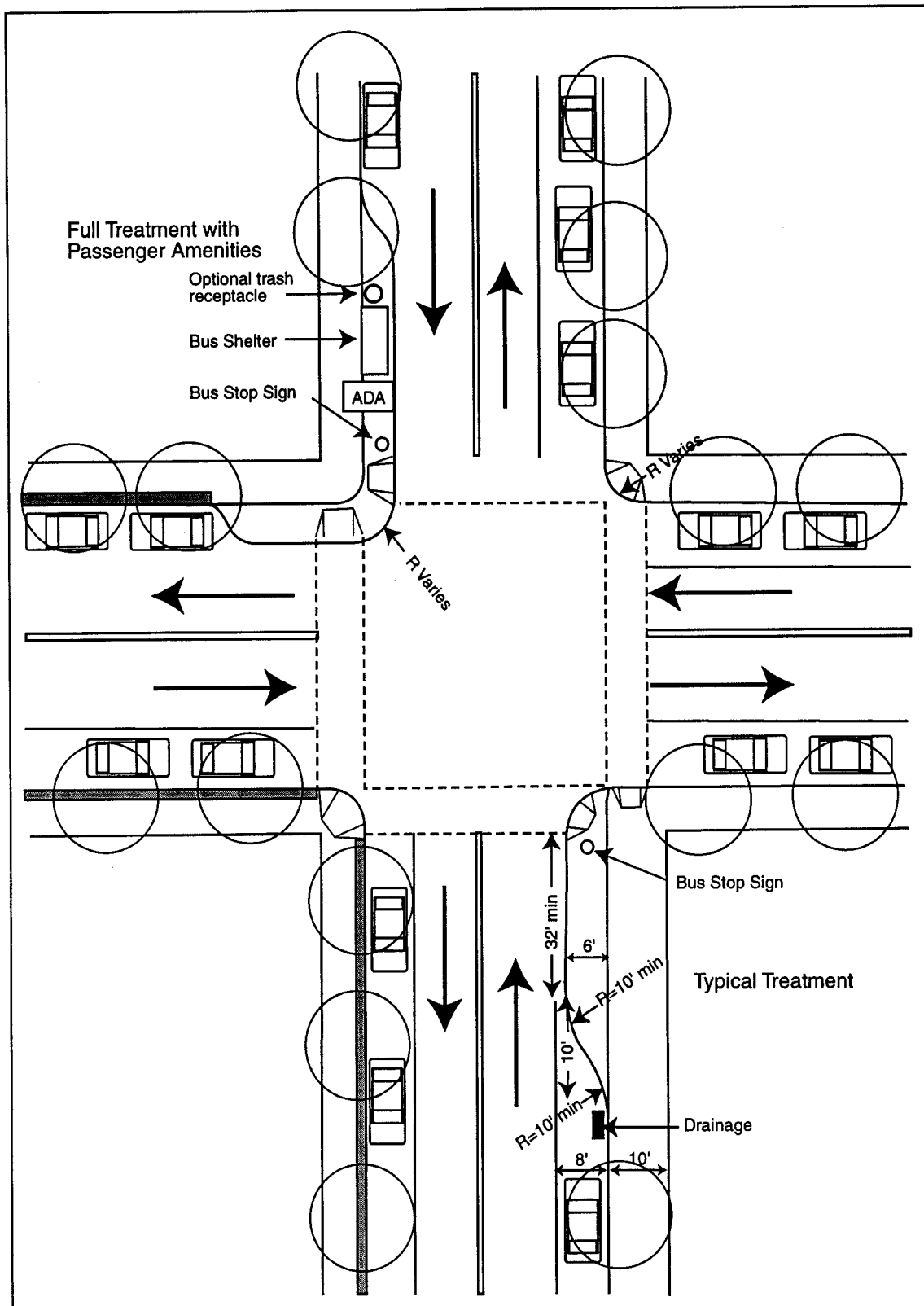
### Acceptable Driveway Arrangements



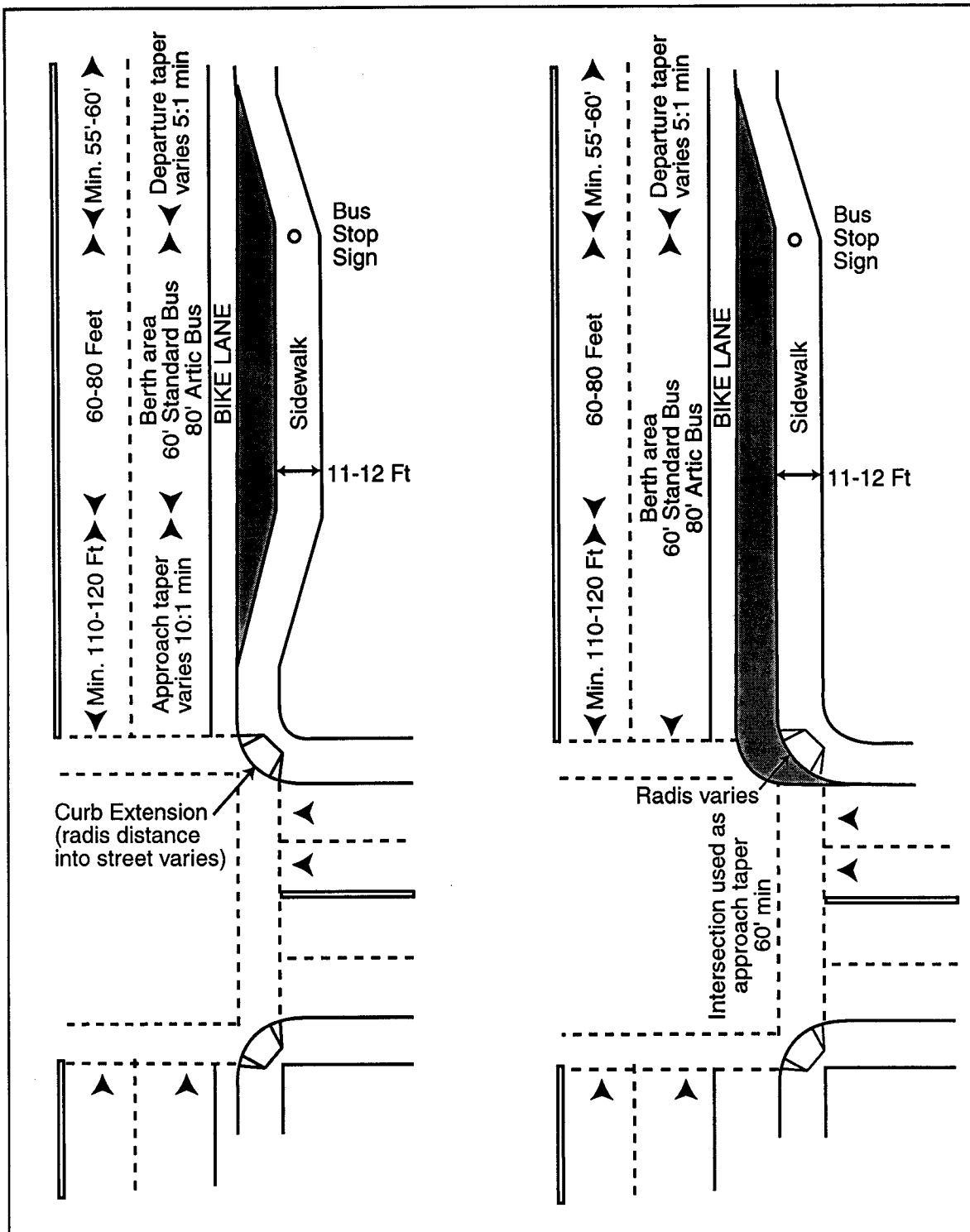
Driveway Locations near Bus Stops  
Figure 32



Recommended Bus Stop/Zone Placement  
Figure 33



Curb Extension Treatment  
Figure 34



Bus Pullout Design Options  
Figure 35