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Bus Platform Accessibility Solutions

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User Guide & Installation Manual

Table of Contents

P-03	Introduction	P-22	Bus Platform Materials
P-04	Modular Design of the Bus Platform	P-25	Resources, Equipment & Materials Necessary for the Installation of the Bus Platform
P-05	Bus Platform Configurations	P-32	Installing the Bus Platform
P-14	Bus Platform Components	P-55	Removal and Reinstallation the Bus Platform
P-19	Properties of the Bus Platform	P-56	Bus Platform Certificates and Awards

1. Introduction

People who live in cities, especially the elderly, parents with baby strollers and even more so people with reduced mobility, face accessibility problems that manifest themselves noticeably at bus stops. Bus stops are located between the street and sidewalk - forming a strategic link where it is necessary to guarantee accessibility by facilitating the easy approach of the bus to the sidewalk curb. When the bus lacks sufficient space to perform the correct maneuver to approach the sidewalk, accessibility problems arise for bus users and passenger loading times increase.

Typically, the solution to this problem has always been to extend the sidewalk toward the road by means of public works. However, the most novel solution developed in recent years has been the installation of semi-permanent platforms that achieve the same results without permanently compromising the use of the road.

As an accessibility solution, ZICLA developed the modular Bus Platform in 2010 - which is a system of flexible and self-connecting components that allow for building a variety of platform configurations with differing shapes and dimensions. This results in substantial improvement in accessibility for bus users in general and, in particular, for people with reduced mobility.

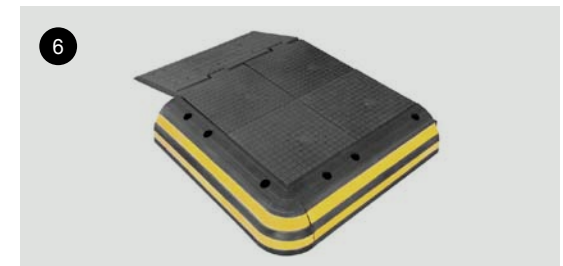
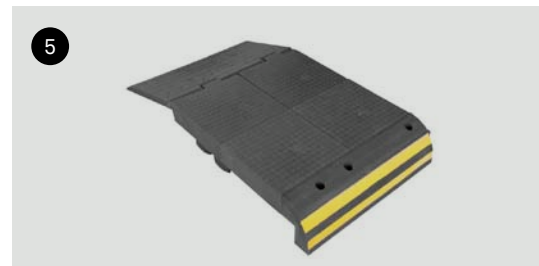
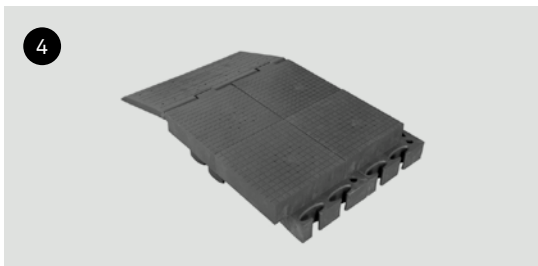
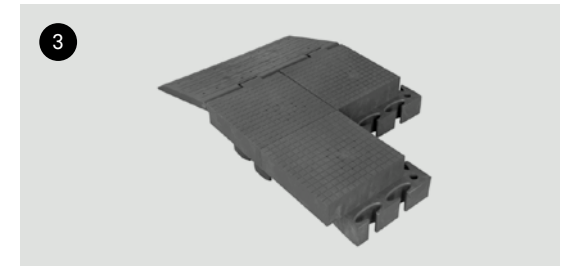
ZICLA's experience shows that in locations where the Bus Platform has been installed, average boarding times are reduced and traffic flow improved as a result. The sidewalks are uncongested as users generally wait for the bus on the PLATFORM, without blocking the way of pedestrians using the sidewalk. This allows the city to provide a faster, safer, accessible and more integrated bus service.



2. Modular Design of the Bus Platform

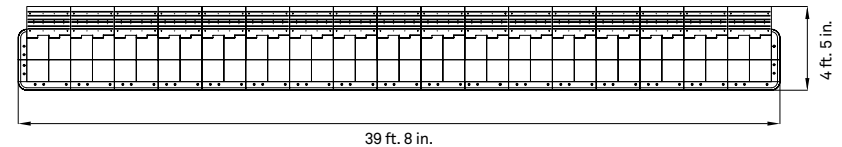
The Bus Platform is made up of a series of components that combine and fit together like pieces of a puzzle to create a great variety of possible configurations.

The following images show how a small platform can be constructed by starting with two MAIN MODULES (with ramp connection) then adding a sidewalk ramp, followed by two other MAIN MODULES (without ramp connection) and finally a CURB and CURB END.



3. Bus Platform Configurations.

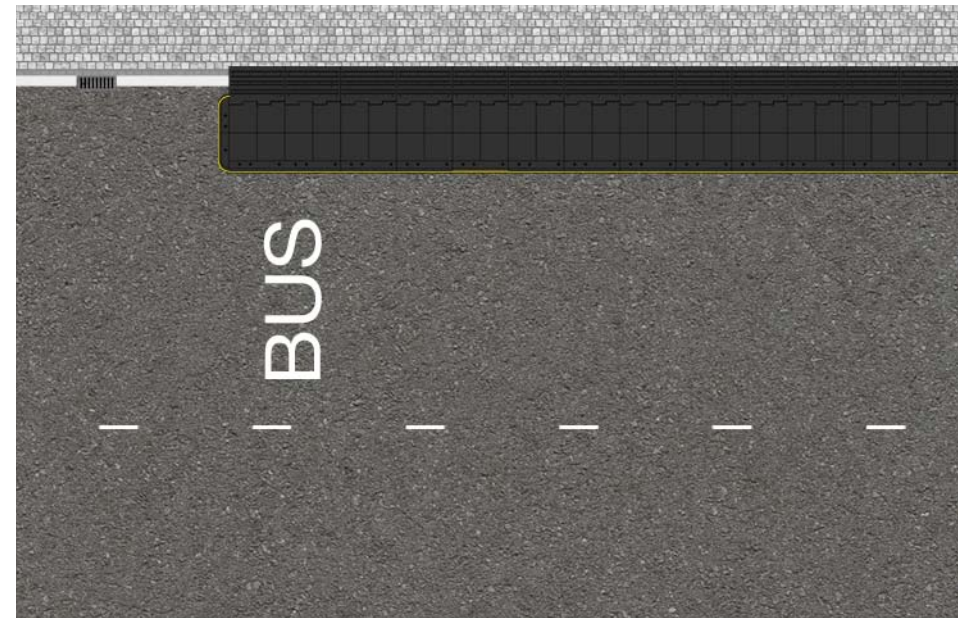
The Bus Platform components allow for creating multiple configurations of different widths and lengths. The WIDTH OF THE Bus Platform is defined by the conditions of the surroundings such as the sidewalk's width, the dimensions of the dock if there is one, the presence of garbage containers nearby, or of diagonally or parallel parked vehicles. The length of the bus determines the LENGTH OF THE Bus Platform.



Most frequent configurations depending on the conditions of the surroundings:

Narrow sidewalk or end of bus route

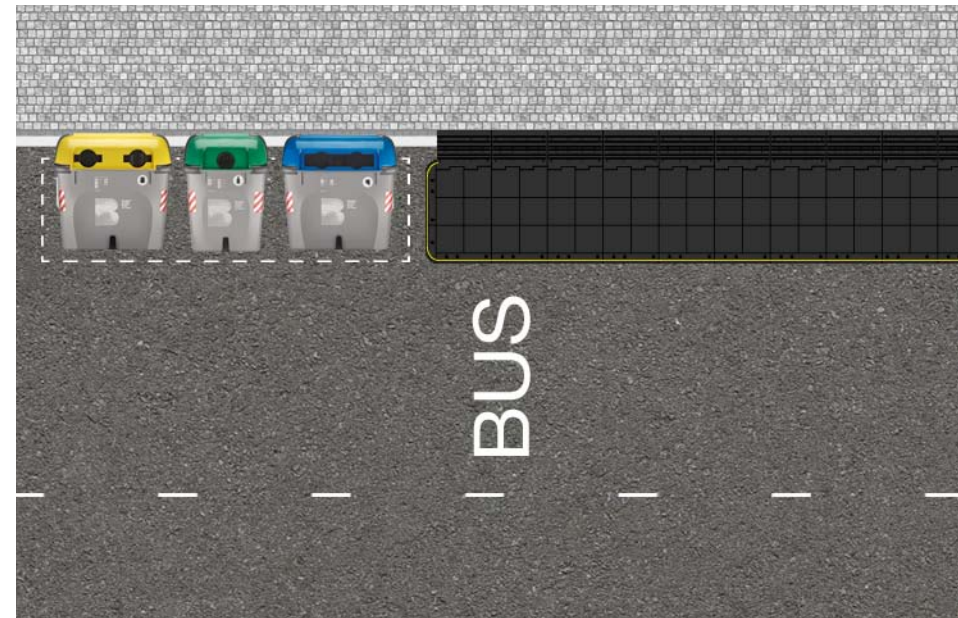
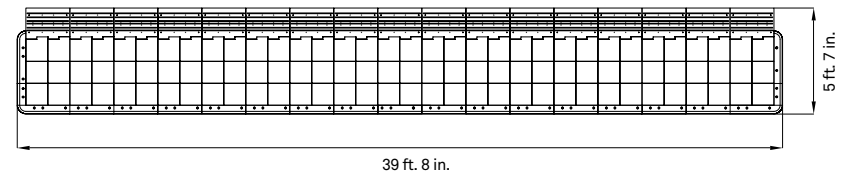
Small platform: two modules wide. The platform is used to widen the space reserved for bus stops. This application is useful when the space is too narrow for a certain number of people to wait comfortably for the bus.



3. Bus Platform Configurations.

Bus stop next to garbage containers

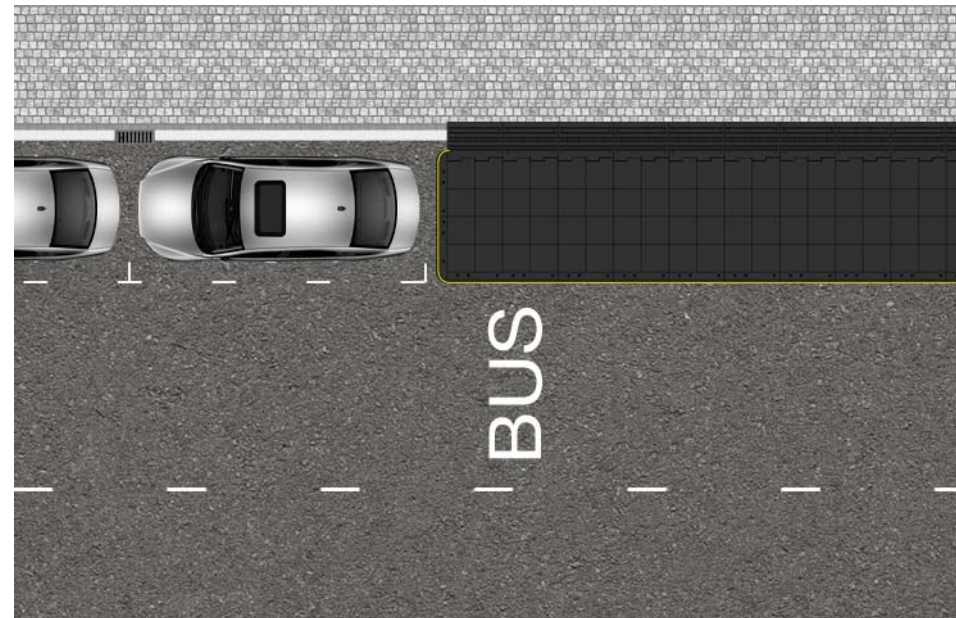
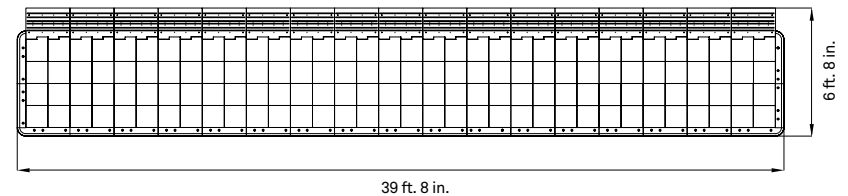
This platform has a width of three MAIN MODULES. Its function is to prevent the presence of garbage containers hindering the approaching maneuver of the bus to the sidewalk curb. It has the necessary width to come in line with the containers.



3. Bus Platform Configurations.

Bus stop next to parallel parked vehicles

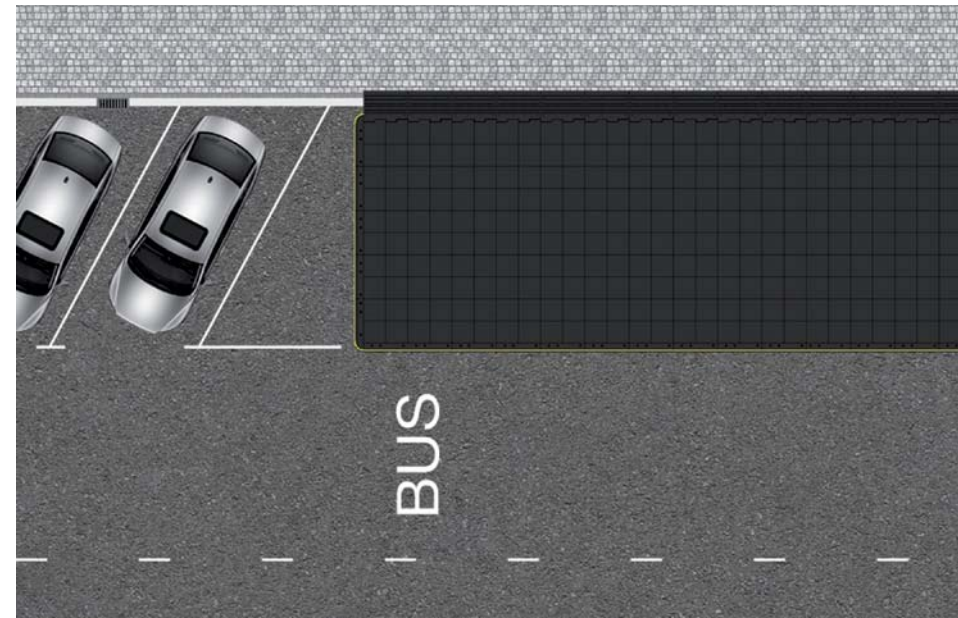
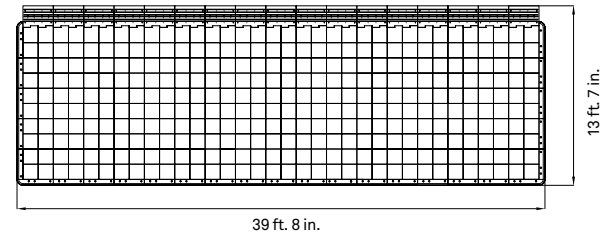
This platform has a width of four MAIN MODULES. Its function is to prevent the presence of parallel parked vehicles from hindering the approaching maneuver of the bus to the sidewalk curb. It has the necessary width to come in line with the parked vehicles.



3. Bus Platform Configurations.

Bus stop next to diagonally parked vehicles

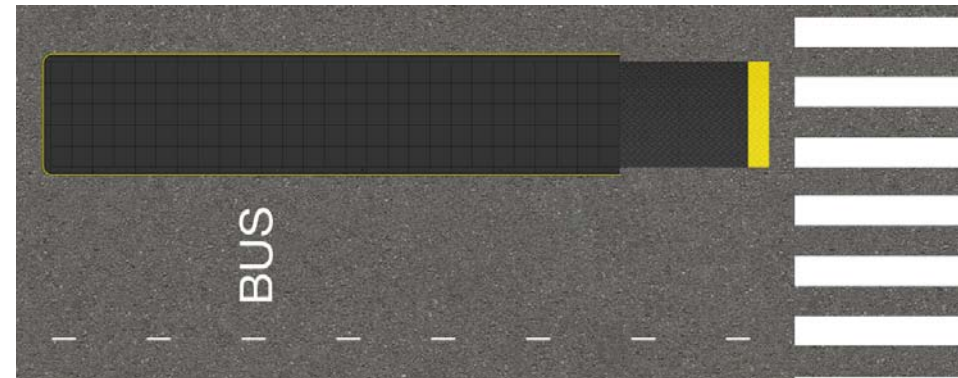
This platform has a width of ten MAIN MODULES. Its function is to prevent the presence of parallel parked vehicles from hindering the approaching maneuver of the bus to the sidewalk curb. It has the necessary width to come in line with the diagonally parked vehicles.



3. Bus Platform Configurations.

Isolated bus stop

This formation is useful when the stop is not connected to the sidewalk, that is, when it is isolated. Access takes place from ground level by means of an additional component called RAMP TO ROAD.

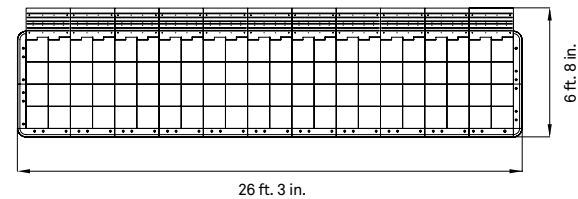


3. Bus Platform Configurations.

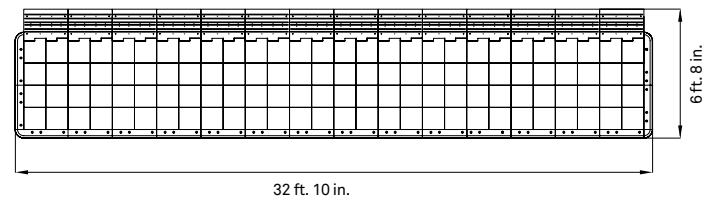
Most frequent configurations depending on length of the bus

The length of the bus determines the total length of the platform, to ensure that all the vehicle's doors are accessible.

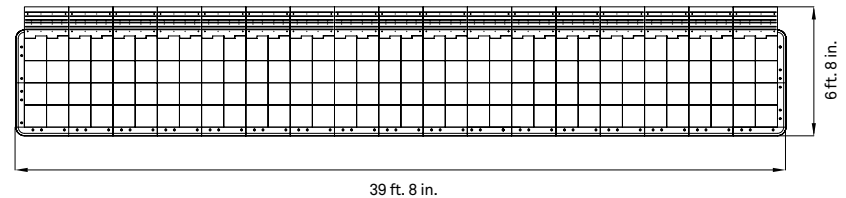
Platform for minibuses
Configuration for small buses (between 22 ft and 26 ft long).



Platforms for midibuses
Configuration for medium-size buses (between 26 ft and 36 ft long).



Platform for standard buses
Configuration for 39 ft long buses

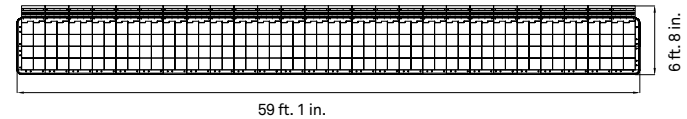


3. Bus Platform Configurations.

Most frequent configurations depending on length of the bus

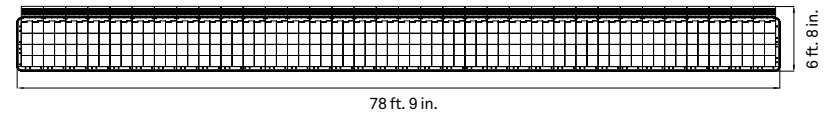
Platform for articulated buses

Configuration for 59 ft long buses.



Platform for bi-articulated buses

Configuration for 78 ft long buses.

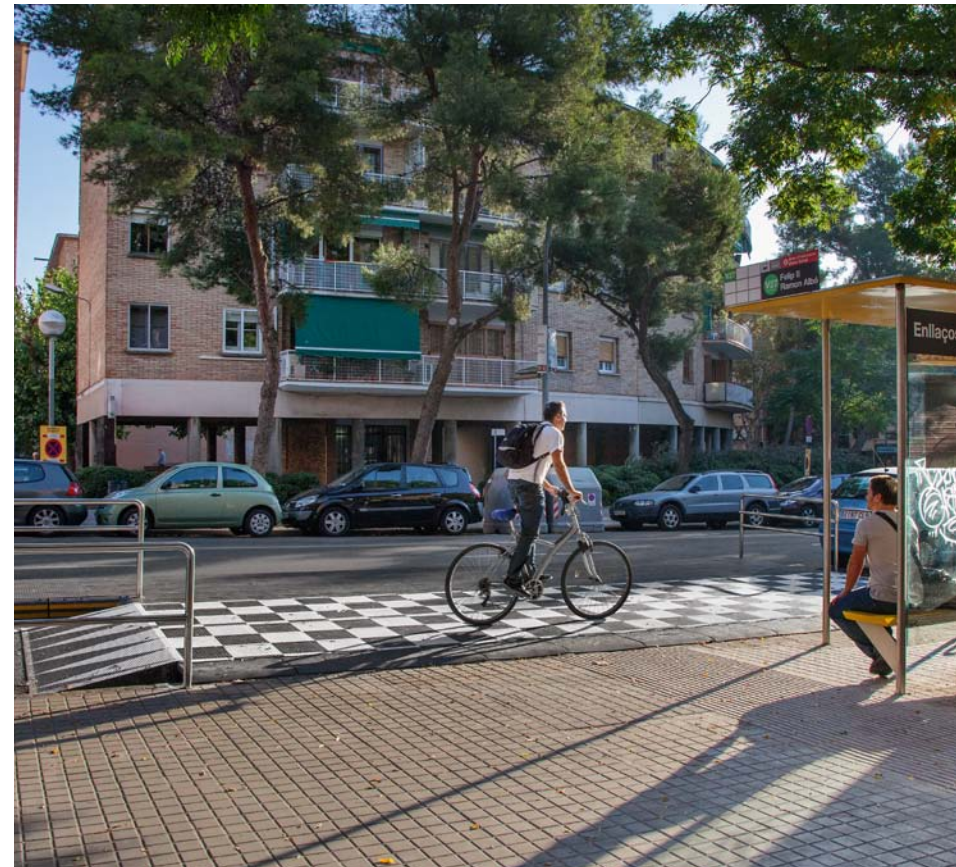


3. Bus Platform Configurations.

Configurations adapted to the presence of bicycle lanes

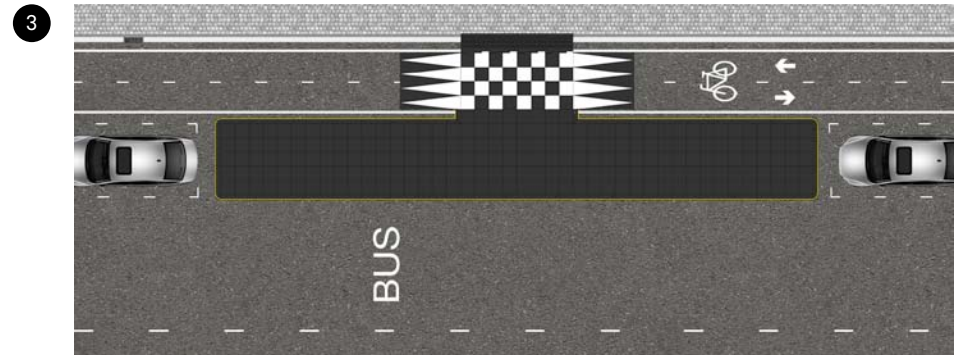
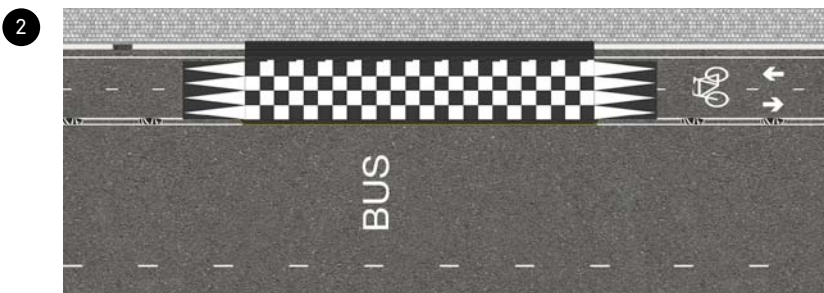
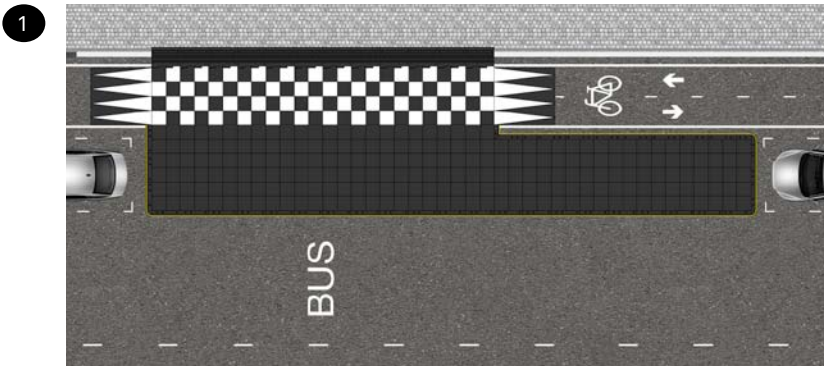
In locations where a bus stop coexists with a bicycle lane, an integrated flow area is built. There will be a conflict zone between pedestrians and cyclists, but cyclists will not have the right of way.

This flow area is exclusively an access area, so that the shelter remains on the sidewalk. However, other solutions for the location of the shelter can be examined. In the conflict zone between pedestrians and cyclists, ramps are built to resolve the level difference and yield signs are painted for cyclists. As a warning measure to remind cyclists that they do not have the right of way, the conflict zone can be painted like a chessboard or checkerboard.



3. Bus Platform Configurations.

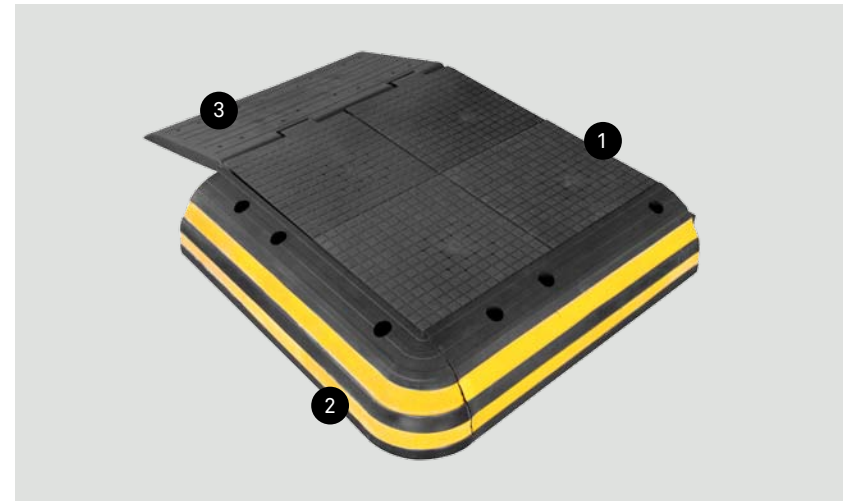
Configurations adapted to the presence of bicycle lanes



4. Bus Platform Components

The Bus Platform is made up of the following components:

1. MAIN MODULE
(With or without connection)
2. CURBS
3. RAMP TO SIDEWALK - PLUS STEEL ROD.
4. RAMP TO ROAD
(only required for certain types of platform)



4. Bus Platform Components

Main Module

The MAIN MODULE has a cubic form with hollow sections and ribs to reduce weight and improve its behavior against static and dynamic stresses. Each module is linked to the next by means of a series of interconnecting locks and can be anchored to the road when necessary. For the design of the MAIN MODULE, a static load equivalent to that transmitted by a bus tire that mounts the platform (accidentally or out of necessity) was taken into consideration.

Main Module with ramp connection

This is a main component that is used to attach the sidewalk ramp to the platform by means of a galvanized steel rod that is inserted in the ramp connection.

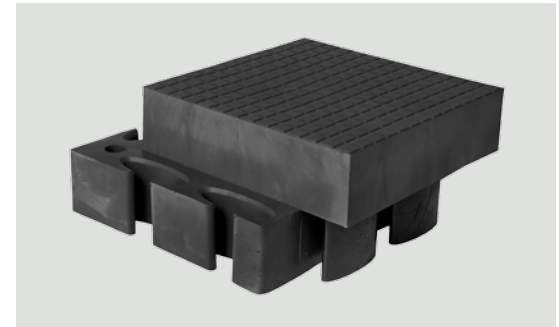
Product Name:

MAIN MODULE

Measurements: 13 25/32
x 13 25/32 x 7 3/32 in.

Weight: 24 lb. 11 oz./unit

Color: Dark Grey



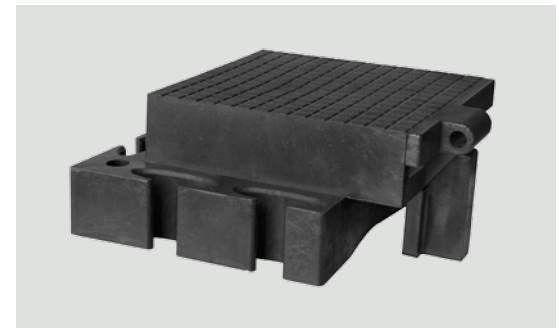
Product Name:

MAIN MODULE WITH
RAMP CONNECTION

Measurements: 13 25/32
x 13 25/32 x 7 3/32 in.

Weight: 25 lb. 12 oz./unit

Color: Dark Grey



4. Bus Platform Components

Curbs

The CURB is elongated and twice as long as the MAIN MODULE. It is also hollow for reduced weight and is linked to the main modules by means of a series of locks. When the curb was designed, the impact of a bus tire was factored in as the most frequent stress. The CURB is anchored to the road surface and its function is to evenly distribute the lateral loads transmitted by bus tires to all of the Bus Platform, as well as guaranteeing the stability and inalterability of installed components.

Each curb has two longitudinal sunken grooves covered with a layer of reflective paint. Reflectance is achieved by glass beads incorporated in paint surface.

Product Name: CURB
Measurements: 27 9/16 x 5 25/64 x 7 3/32 in.
Weight: 20 lb. 4 oz./unit
Color: Dark Grey



Product Name: LEFT CURB
Measurements: 32 61/64 x 5 25/64 x 7 3/32 in.
Weight: 22 lb. 1 oz./unit
Color: Dark Grey



Product Name: RIGHT CURB
Measurements: 32 61/64 x 5 25/64 x 7 3/32 in.
Weight: 20 lb. 4 oz./unit
Color: Dark Grey



4. Bus Platform Components

Ramp to sidewalk

The RAMP TO SIDEWALK is a hinged ramp of a length equivalent to two MAIN MODULES. Its function is to bridge the gap between the sidewalk and the platform and grant access to the latter. It is linked to the MAIN MODULE WITH RAMP CONNECTION by means of a galvanized steel rod.

It has a thickness of $1 \frac{37}{64}$ in. and a steel core that allows it to absorb a load equivalent to that transmitted by the tire of a van or another vehicle of similar gross weight.

This RAMP TO SIDEWALK component allows for the free flow of rainwater underneath it, leaving a clear horizontal space of $19 \frac{11}{16}$ in. In addition, this is a hinged ramp - which can be lifted so as to facilitate the cleaning of leaves and other types of residue that may accumulate underneath and obstruct the flow of water.

Product Name:

RAMP TO SIDEWALK

Measurements: $27 \frac{9}{16} \times 19 \frac{11}{16} \times 1 \frac{37}{64}$ in.

Weight: 26 lb. 7 oz./unit

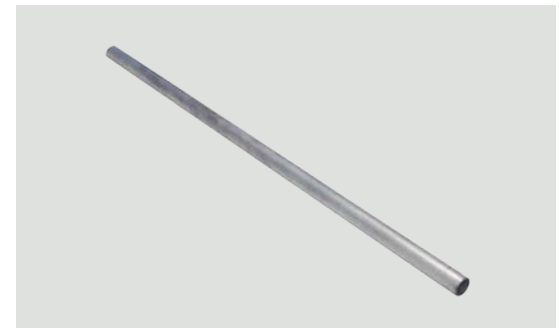
Color: Dark Grey



Product Name: Rod

Measurements: $78 \frac{47}{64} \times D 2 \frac{11}{64}$ in.

Weight: 2 lb. 13 oz./unit



4. Bus Platform Components

Ramp to road

The hingeless RAMP TO ROAD is an accessory for the standard Bus Platform. This component is made of sheet metal and is anchored to the road surface. It allows for access to the platform from ground level and it is useful in cases of isolated bus stops - where there is no sidewalk or as well as hinged ramps, there is a need to provide an additional access for the user. It is custom-made depending on the incline required by local regulations.

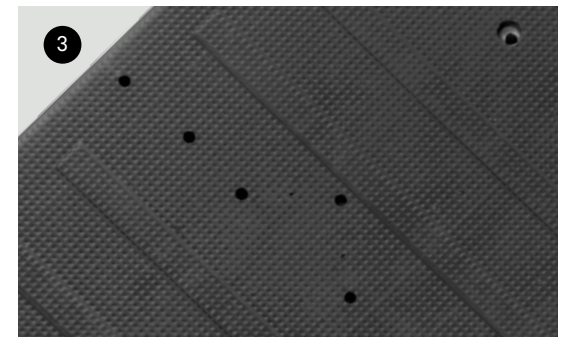
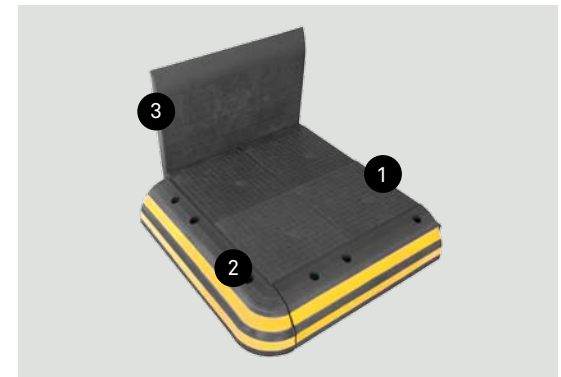


5. Properties of the Bus Platform

Textured surface of the exposed sections of the Bus Platform

All exposed elements of the platform have a textured non-slip surface. The test performed on it following regulation UNE-ENV 12633:2003 results in a surface categorized as CLASS 3, the one required for wet exterior areas for pedestrian use.

1. MAIN MODULE
2. CURB
3. RAMP TO SIDEWALK

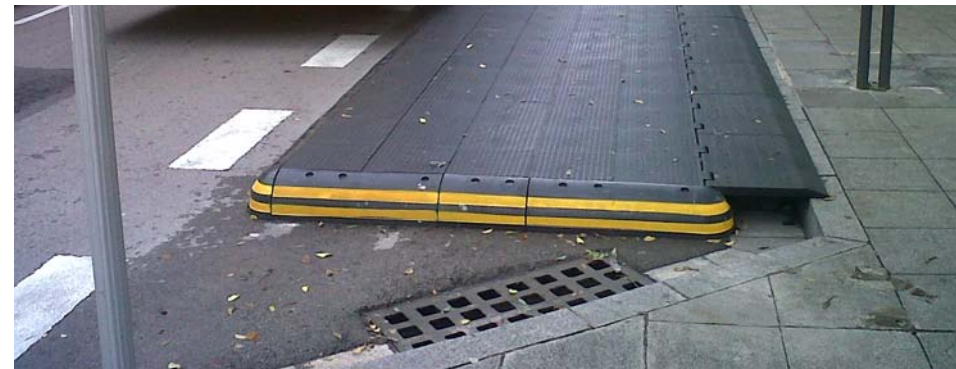
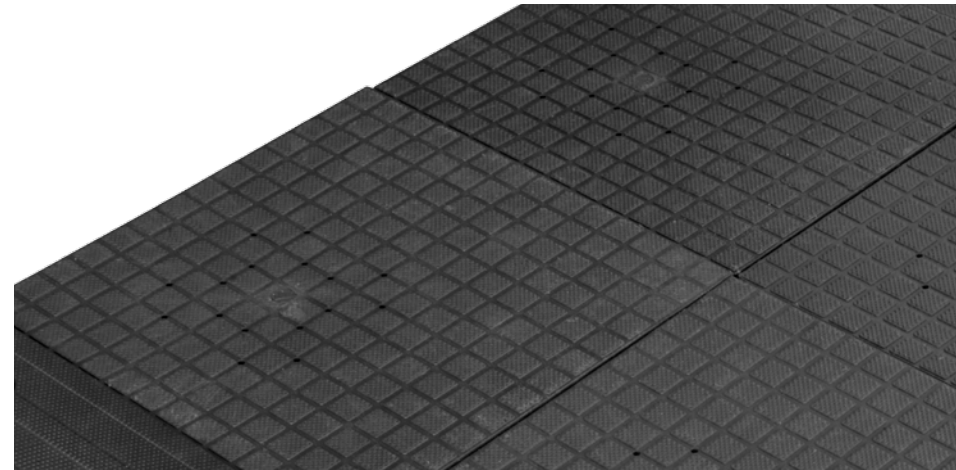


5. Properties of the Bus Platform

Water drainage

Rainwater or excess water from cleaning processes do not accumulate on the Bus Platform's surface because they drain towards the road in three different ways: on the surface toward the perimeter, through the drains of each MAIN MODULE, and through the joints between components. Also, water flows underneath the MAIN MODULES and CURBS towards the street's sewers through the spaces between the base of these modules and the road surface.

In addition, the RAMP TO SIDEWALK that is linked to the MAIN MODULE WITH RAMP CONNECTION by means of the ROD, allows for a free flow of rainwater underneath - with a clear horizontal space of 19 11/16 in. Furthermore, this is a swinging ramp, which facilitates the cleaning of leaves and other types of residues that may accumulate under the ramp and could obstruct the flow of water.

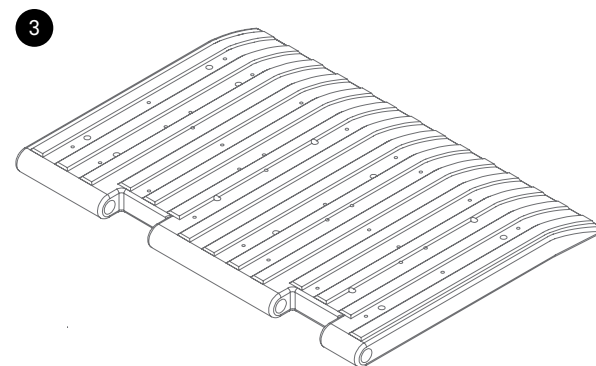
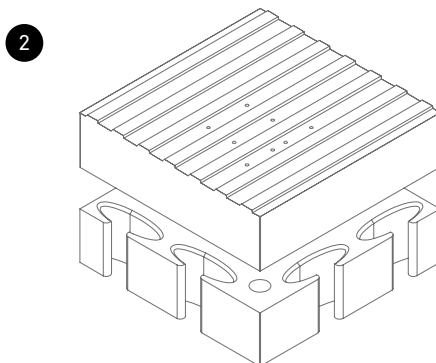
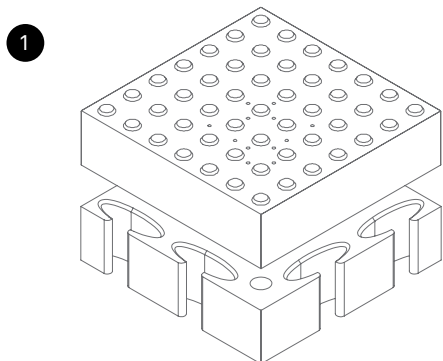
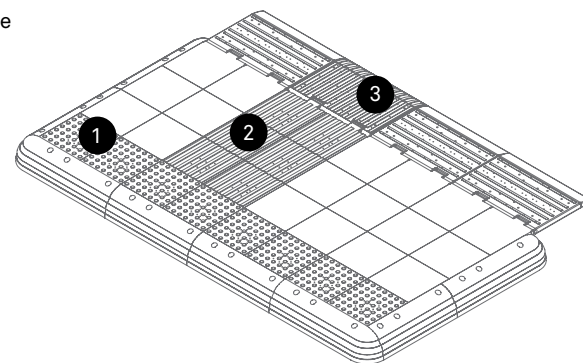


5. Properties of the Bus Platform

Adaptation of the surface

The MAIN MODULE surface of the Bus Platform can be adapted to create a contrast with the conventional flooring, thus complying with the requirements of accessibility regulations in each location. Here are several types of tactile surfaces that can be reproduced on the Bus Platform surface.

1. Warning tactile surface
2. Directional tactile surface
3. Directional tactile surface



6. Bus Platform Materials.

The material used to produce the Bus Platform is made from 100% recycled PVC, of post-consumer and post-manufacturing origin. The post-consumer element comes from the recovery of copper from old electrical cables. This is then mixed with other PVC residues from manufacturing industries in order to achieve a repeatable, certifiable material that complies with the design requirements it was conceived for.

All the pieces of the Bus Platform are manufactured with this recycled material except the RAMP TO SIDEWALK, which includes an integrated steel core and the ROD, which is made of galvanized steel.

Properties of the material:

A. HIGH LEVEL RESISTANTANCE TO ABRASION

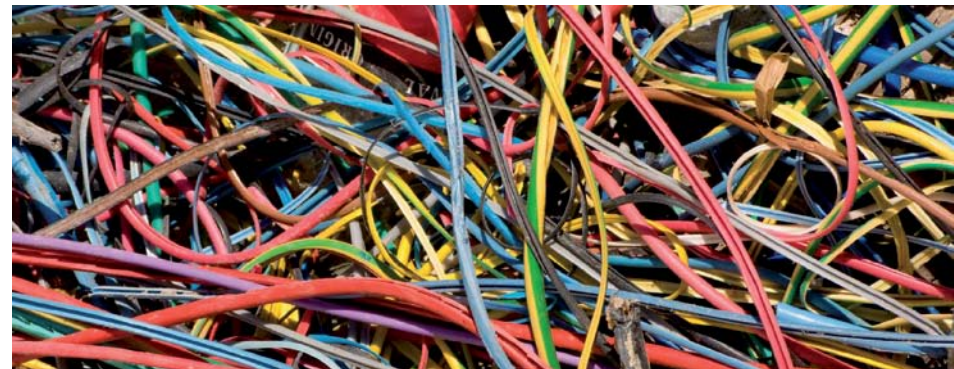
B. GOOD MECHANICAL & IMPACT RESISTANCE: It has been used for many years in the construction industry, especially for door and window frames.

C. ADAPTABLE TO DIFFERING CLIMATES & MECHANICAL DEMANDS:

The mix of different PVC types, recycled from various industries, allows for adjusting the rigidity and flexibility of the components against mechanical stress and temperature changes.

D. STABLE & INERT: The PVC is noteworthy because it is ductile and tough, demonstrating dimensional stability and weathering resistance.

E. GREAT DURABILITY: As demonstrated when used on installations that hold up over the years, such as water pipes. In addition, PVC is the plastic par excellence that replaces traditional metallic carpentry in exterior enclosures.



6. Bus Platform Materials.

F. ELECTRICAL INSULATION: Efficiently used to insulate and protect electrical cables.

G. RESISTANT TO CORROSION

H. EXCELLENT BEHAVIOR WITH REGARD TO UV RAYS

I. GOOD REACTION AGAINST FIRE: This is a EUROCLASS BFL-s1 material. Due to the polymer's chlorine atoms, the PVC does not burn or combust spontaneously. Furthermore, it stops burning once the heat source has been removed.

J. INFINITE RECYCLABILITY

The characterization of the recycled material used to manufacture the Bus Platform is as follows:

Properties	Unit	Regulation	Value
Hardness	ShA	DIN 53505	92
Tensile strength	MPa	UNE EN ISO 527-2527-2	12
Elongation at break	%	UNE EN ISO 527-2527-2	130
Tear resistance	kN/m		36
Taber abrasion loss	mg/1,000 cycles	UNE 135203	109
Lightfastness		UNE 4892-3	Excellent
Resistance to acids			Excellent
Resistance to bases			Excellent
Reaction to fire		Euroclass	B _{FL} -s1
Density	g/cm ³	UNE EN ISO 1183-1A	1.29
Crush resistance	kN		200

6. Bus Platform Materials.

Environmental value

The fact that the Bus Platform components are manufactured with recycled PVC results in a series of environmental benefits:

- A. Less pressure on landfills**
- B. Savings in the consumption of natural resources**

In addition, if a PVC Bus Platform is compared via Lifecycle Analysis methodology to a precast concrete platform, the former performs better environmentally per surface unit, as evidenced by:

- A. Less consumption of resources**
- B. Less ocean acidification**
- C. Less eutrophication**
- D. Less impact on global warming**
- E. Less destruction of ozone layer**
- F. Less human toxicity**



7. Resources, Equipment & Materials Necessary for the Installation of the Bus Platform

Site management

The site will require standard warning signs and traffic management. At least one week before, a sign must be set up giving information about the period of time the works will occupy the road area. This sign must indicate that during that period, no parking (including stopping) will be allowed.

Although highway safety measures should be followed there will be minimal disruption to road users and pedestrians.



Moving the components

One person can easily handle each component (in the design stage, it was that each part should not exceed 26 lb. 7 oz.). This convenience avoids the use of special lifting equipment.

A van or boom trucks for larger installations can be used to move the platform sections to the site.



7. Resources, Equipment & Materials Necessary for the Installation of the Bus Platform

Tools required to install the platform:

1. 15/32 in. diameter drill



3. Resin dispenser gun



2. Air compressor to clean the holes



4. Circular saw for cutting the CURB sections when necessary



7. Resources, Equipment & Materials Necessary for the Installation of the Bus Platform

6. Socket wrench for nuts



Tools required to install the access ramp from the street:

1. 25/64 in. diameter drill
2. 3 5/32 in. diameter and 3 5/32-3 15/16 in.-long rods



Other materials recommended to install the platform:

1. Lubricant for the ROD.
2. Rubber mallet
3. Builders Line (string) for alignment.



7. Resources, Equipment & Materials Necessary for the Installation of the Bus Platform

Recommended type of anchor

When choosing the type of anchor, a series of mechanical criteria should be kept in mind. The Bus Platform components must be able to withstand impact and the friction loads of the bus wheels. As these sections are anchored to the road surface, any impact or friction is transmitted to the asphalt through the anchoring system. For this reason, it is important that these anchors, as well as the road surface, are capable of withstanding the aforementioned stresses.

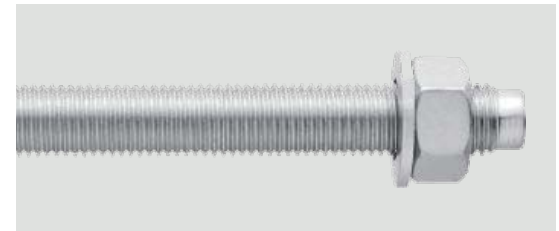
ZICLA's experience indicates that chemical anchoring has better results, regardless of the type of surface and its state of repair. However, metal expansion anchors only work correctly on concrete surfaces.

Below is a detailed description of the minimum conditions with which chemical anchoring must comply:

25/64 in. diameter galvanized steel threaded bolt (rod) + M10 nut + epoxy, polyester or mixed resin, styrene-free.

The resins with better performance for exterior applications are the epoxy type and the polyester type. It is advisable that they be styrene-free, as they emanate fewer odors and are considered less dangerous in case of deep inhalation.

Product: Threaded bolt (rod) HIT-V 8.8
Measurements for main module: 5 29/32 x D25/64 in.
Measurements for curb: 8 21/32 x D25/64 in.
Quality: 8.8 carbon steel
Bolt end: With removable bolt head



Product: Chemical anchor
Conditions of the base material: Humid, dry
Fixing elements: Stem nut HIS-N, threaded rods HIT-V 8.8



7. Resources, Equipment & Materials Necessary for the Installation of the Bus Platform

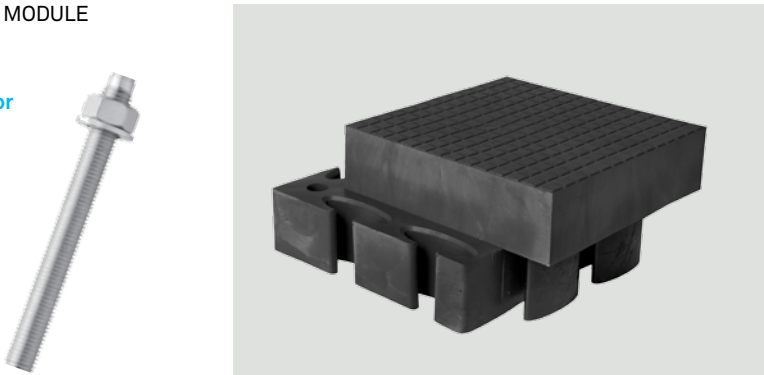
Two different lengths are needed to anchor the platform sections. One for the MAIN MODULE and another for the CURB.

5 29/32 in. anchor for the MAIN MODULE

For the MAIN MODULE, the recommended length is 5 29/32 in. (2 ¾ in. inserted inside the module + 3 5/32 in. below the road surface)

MAIN MODULE

x1
anchor



8 21/32 in. anchor for the CURB

For the CURB, the recommended length is 8 21/32 in. (5 33/64 in. inserted inside the section (inside the piece) + 3 5/32 in. below the road surface).

CURB

x3
anchors



7. Resources, Equipment & Materials Necessary for the Installation of the Bus Platform

Chemical anchoring requires special attention in two regards. The first one is that both the rods and the holes must be clean. The second is that the hardening time varies depending on climate conditions. The resin manufacturers' instruction manuals usually provide information regarding these matters. In any case, it is advisable to consult the fact & safety sheet issued by the manufacturer of the chosen resin before using it. It is very important not to use expired resins.

1. Drilling



2. Cleaning the holes.



3. Filling with resin



4. To ensure that the rod is correctly anchored, it should be rotated while being inserted into the hole (full of resin) so that the thread is packed completely with resin



7. Resources, Equipment & Materials Necessary for the Installation of the Bus Platform

The calculation of required quantities of resin is made based on the volume formula of one cylinder:

$$\text{Resin volume} = (\pi / 4) \times D^2 \times L \text{ [mm}^3\text{]}$$

Where D is the drill's diameter and L is the depth of the anchoring.

The following table shows the volume of resin and the quantity of minimum anchors needed for the most common configurations of the Bus Platform.

Bus Platform's dimensions (feet and inches)	No. of 5 29/32 in. anchors	No. of 8 21/32 in. anchors	in ³ resin
Dimensions in different widths:			
39 ft. 8 in. x 4 ft. 5 in.	34	59	102.6 in ³
39 ft. 8 in. x 5 ft. 7 in.	34	61	104.8 in ³
39 ft. 8 in. x 6 ft. 8 in.	45	63	119.2 in ³
39 ft. 8 in. x 13 ft. 7 in.	67	81	163.4 in ³
Dimensions in different lengths:			
39 ft. 8 in. x 4 ft. 5 in.	10	24	37.5 in ³
39 ft. 8 in. x 5 ft. 7 in.	29	45	81.7 in ³
39 ft. 8 in. x 6 ft. 8 in.	37	54	100.4 in ³
39 ft. 8 in. x 13 ft. 7 in.	45	63	119.2 in ³
59 ft. 1 in. x 6 ft. 8 in.	69	90	175.5 in ³
78 ft. 9 in. x 6 ft. 8 in.	90	114	225.2 in ³
Dimensions in isolated bus stops:			
39 ft. 8 in. x 6 ft. 8 in.	27	110	164.8 in ³

8. Installing the Bus Platform

The Bus Platform is very easy to install. No special leveling operations are needed, only a simple reassessment. The interconnecting design is error or deviation free. Each component has to connect to the next one in a clear sequence.

Installing the platform next to the sidewalk

1. Reviewing the state of the road surface.

Even though the Bus Platform adapts very well to surface texture and road topography, it is important to inspect beforehand whether there are potholes or bumps - since they could alter the connection of the components. In most cases, potholes or bumps can be fixed with a leveling layer of cold or hot asphalt or with concrete. No major resurfacing work is needed.



8. Installing the Bus Platform

2. Assessment

When doing the assessment, aspects regarding the bus stop's surroundings need to be kept in mind. These are:

COEXISTENCE OF THE BUS PLATFORM WITH OTHER URBAN ELEMENTS:

Containers and parked vehicles

The Bus Platform is usually installed next to containers or parked vehicles. In this case, it must be perfectly aligned with these elements so as not to cause problems for the bus when performing the maneuver to approach the bus stop.

Rainwater sewers

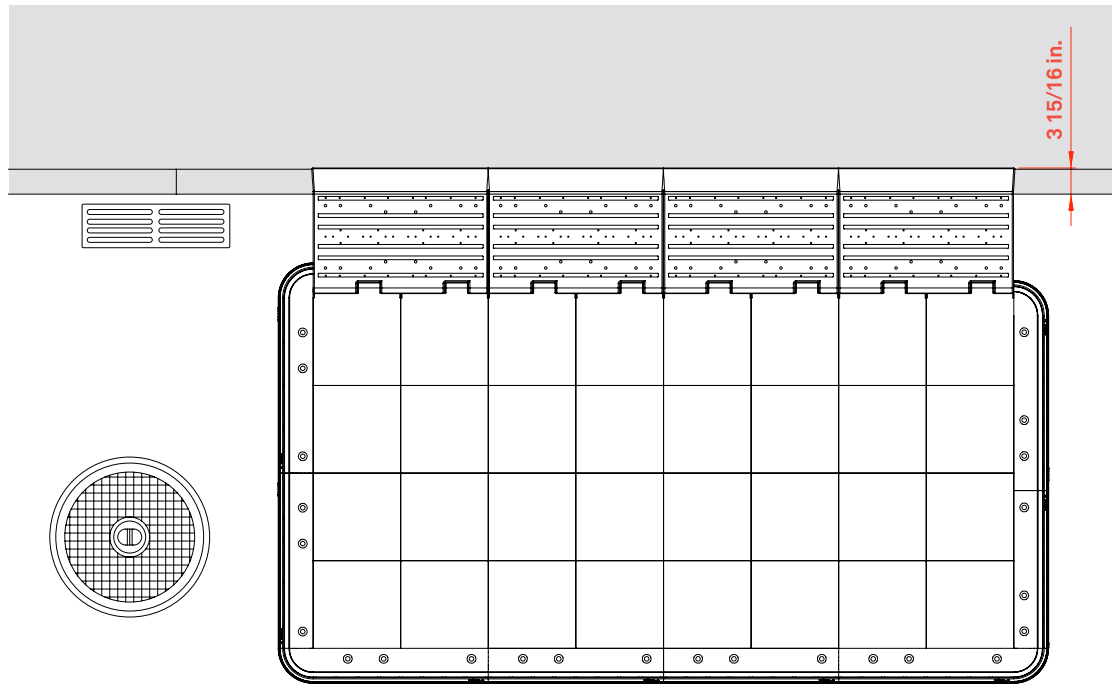
Rainwater sewers, in the majority of cases, are located next to the curbs, receiving the water from the sidewalk and the road, but there are occasions in which these are located in the middle of the street. On such occasions, it is advisable to move the bus stop the necessary distance so as not to cover the sewers with the Bus Platform.

Access lids

Access lids to public works must never be covered by the Bus Platform. Thus, if necessary, the bus stop must be moved.

8. Installing the Bus Platform

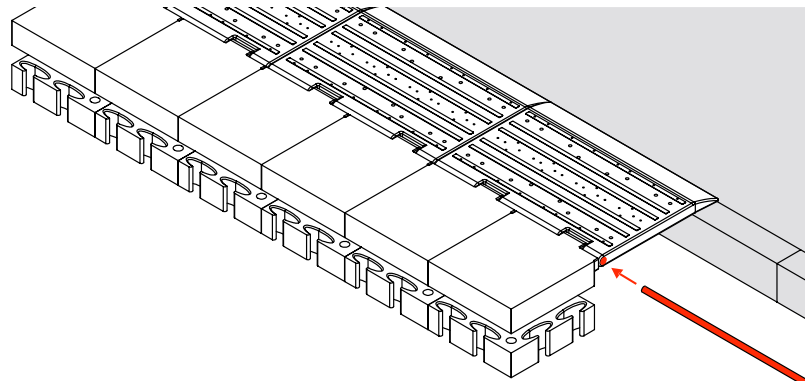
At least $3 \frac{15}{16}$ in. of the RAMP TO SIDEWALK must be set on the sidewalk for adequate support.



8. Installing the Bus Platform

3. Installation of the first row of MAIN MODULES with the RAMP TO SIDEWALK

As seen in the first image, after connecting 6 MAIN MODULES WITH RAMP CONNECTION, a 6 ft. 7 in.-ROD must be inserted. This must be repeated until the complete length of the Bus Platform has been completed. To facilitate the insertion of the ROD, it is advisable to use lubricant so that it slides in more easily.



x6
MAIN MODULE WITH
RAMP CONNECTION



x3
RAMP TO SIDEWALK

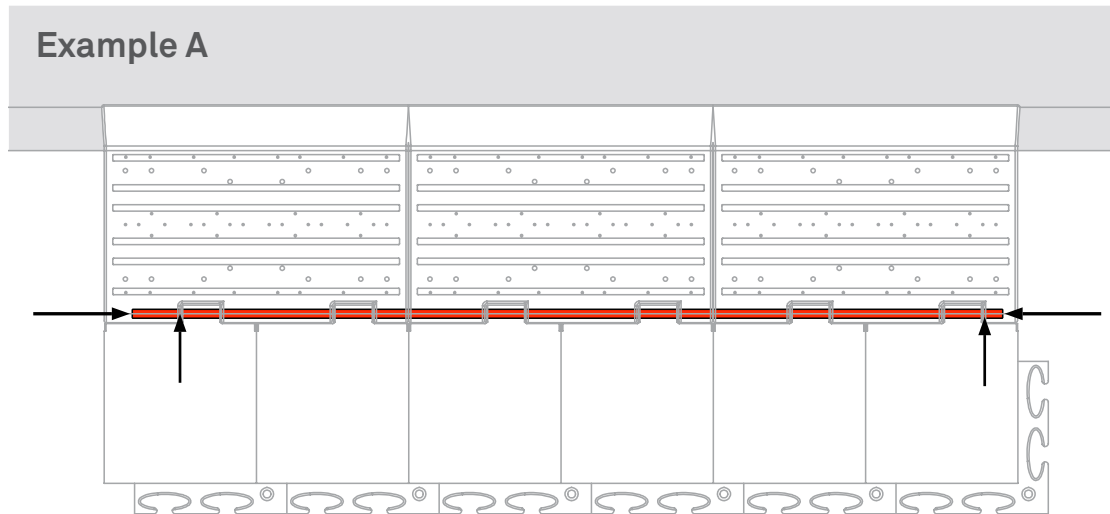


x1
ROD
for every 3 ramps to
sidewalk



8. Installing the Bus Platform

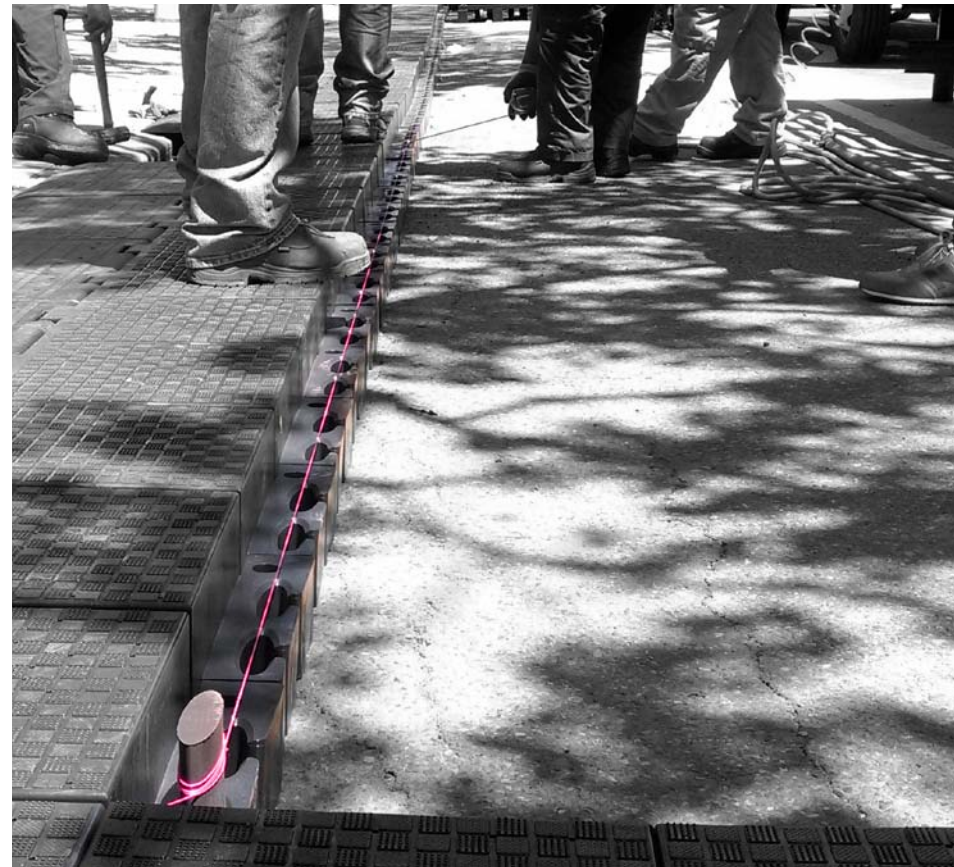
As seen in Example A, the end of the ROD and the hinge slot should never coincide.



8. Installing the Bus Platform

4. Alignment of the first row of MAIN MODULES WITH RAMP CONNECTION

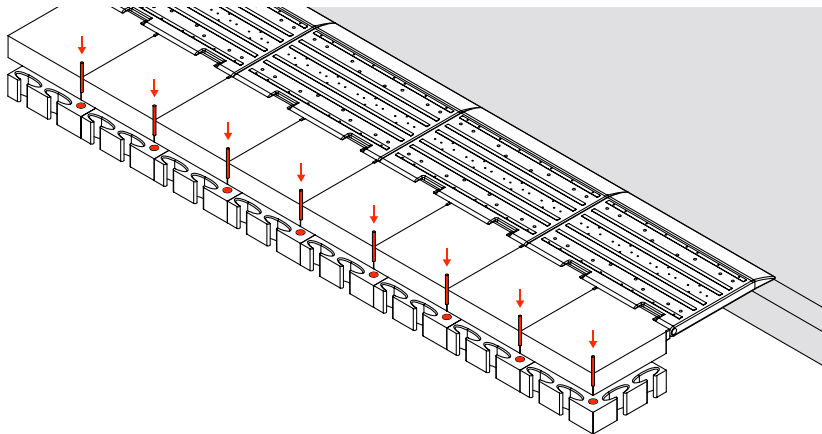
Once the first row of MAIN MODULES WITH RAMP CONNECTION and the RAMPS TO SIDEWALK are installed, it is important to verify the alignment of the pieces. For that reason it is useful to use builders line, as seen in the next image.



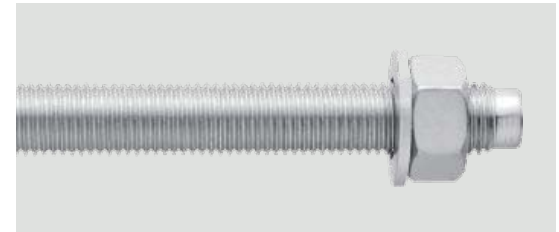
8. Installing the Bus Platform

5. Anchoring the first row of MAIN MODULE WITH RAMP CONNECTION

Once the alignment has been confirmed, the anchors of the first row of MAIN MODULES WITH RAMP CONNECTION can be installed. In this first row of MAIN MODULES WITH RAMP CONNECTION, one anchor per piece must be installed.



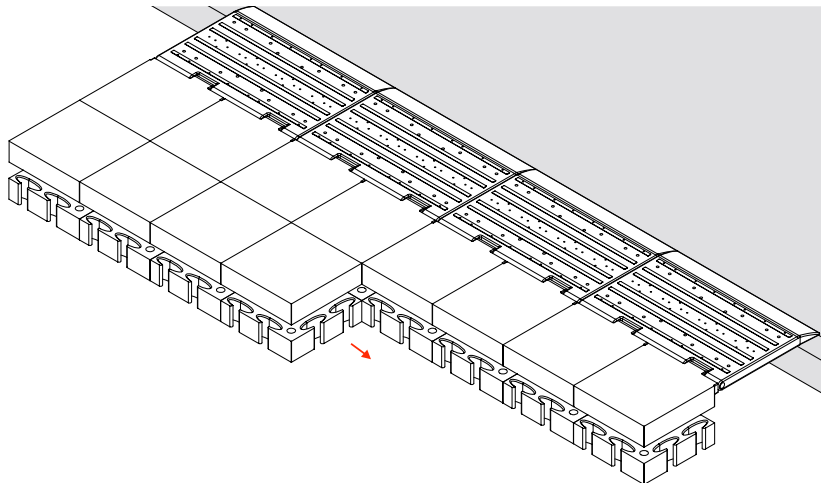
x8
Anchor
5 29/32 in



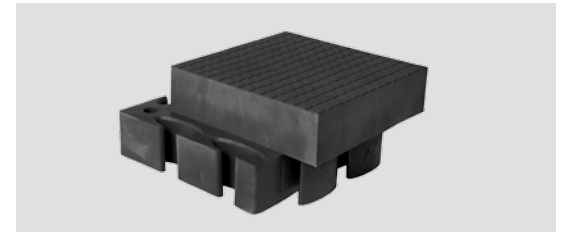
8. Installing the Bus Platform

6. Installing the second, third and following rows of the MAIN MODULES:

The second row of MAIN MODULES is connected to the first line BUT NOT anchored to the road surface.

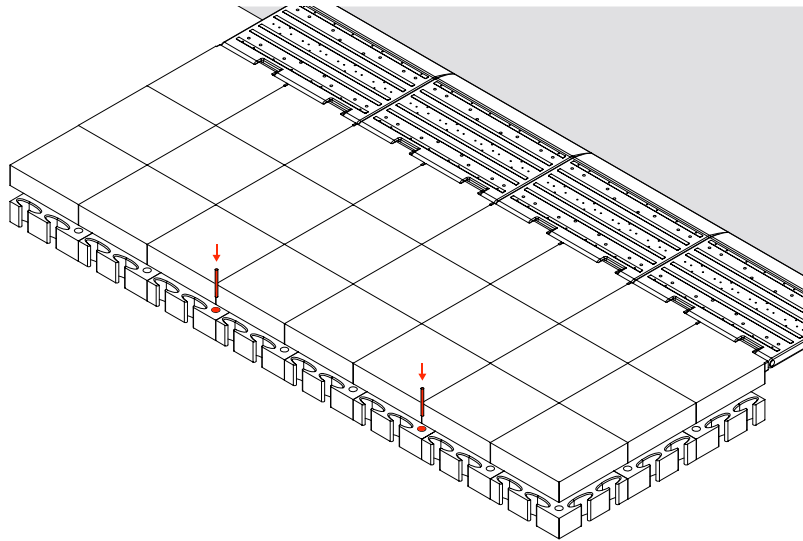


x16
MAIN MODULE

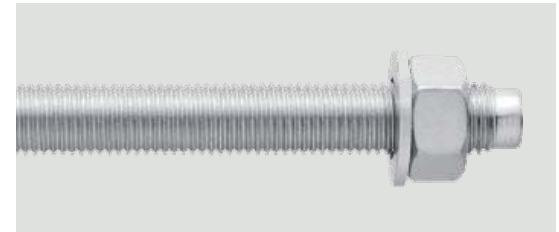


8. Installing the Bus Platform

In the third row, one in every three MAIN MODULE is anchored.
This sequence is repeated until the last row of the Bus Platform.



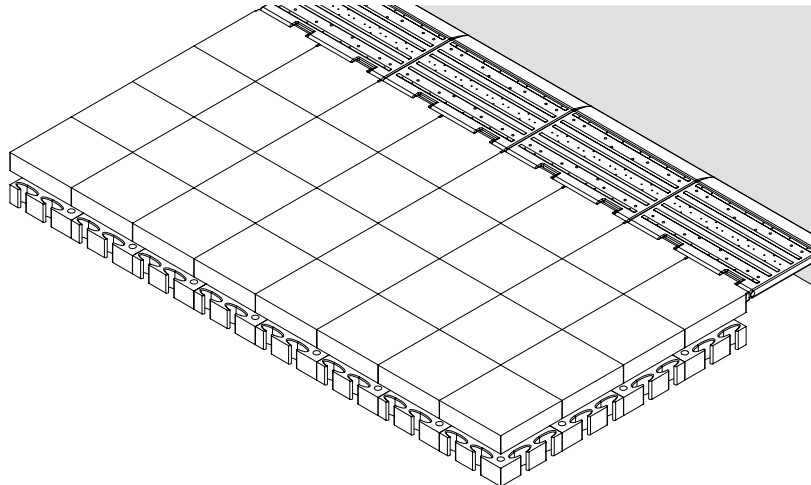
x2
Anchor
5 29/32 in



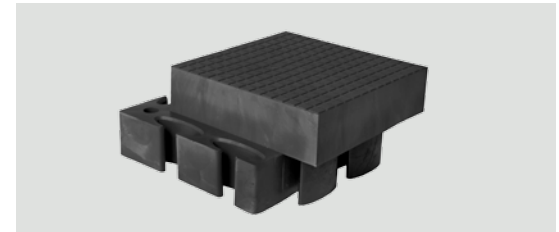
8. Installing the Bus Platform

7. Installing the last row of MAIN MODULES

The last row of **MAIN MODULES** never has anchors. This is valid in all cases, even if the last row is the second, third, fourth or ninth row.



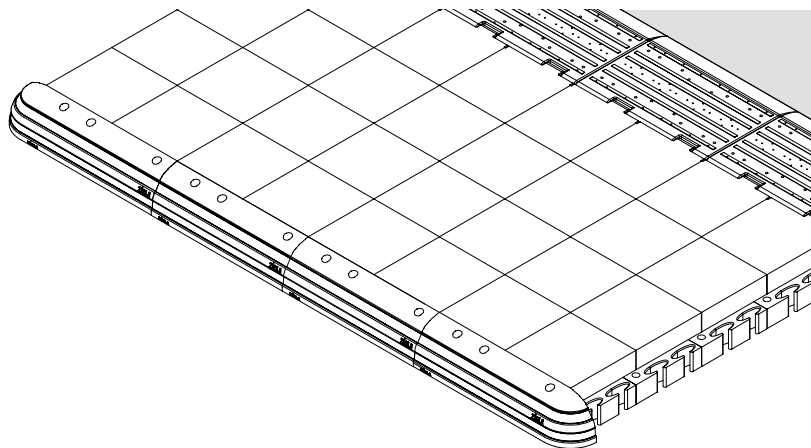
x8
MAIN MODULE



8. Installing the Bus Platform

8. Installing the FRONT FACING CURBS

The FRONT FACING CURBS are connected to the MAIN MODULES in the last row, keeping in mind that on both ends, a RIGHT CURB and LEFT CURB must be placed respectively. Finally, the CURBS are fixed to the road surface with the proper anchors.



MIDDLE CURB SECTION ^{x2}



LEFT CURB SECTION ^{x1}



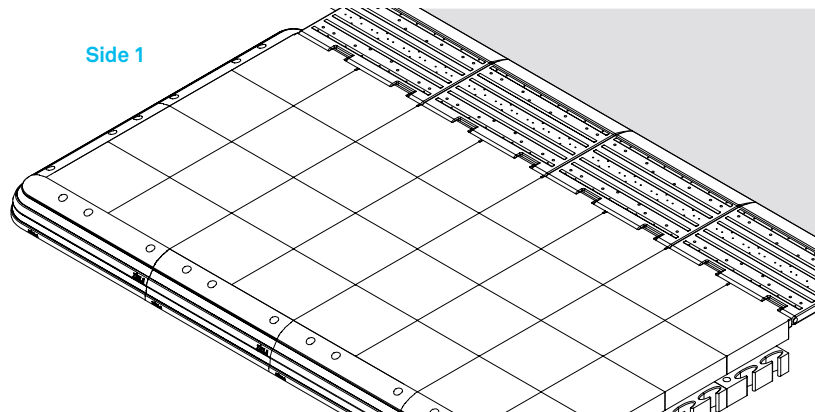
RIGHT CURB SECTION ^{x1}



8. Installing the Bus Platform

9. Installing the CURB SECTIONS on Side 1

The CURB SECTIONS on side 1 do not connect to the MAIN MODULES. They are simply anchored to the road surface. It must be noted that in order to finish the installation of this side, a RIGHT CURB SECTION must always be installed next to the RAMP TO SIDEWALK. Finally, the CURB SECTIONS are fixed to the road surface with the proper anchors.



MIDDLE CURB SECTION ^{x1}



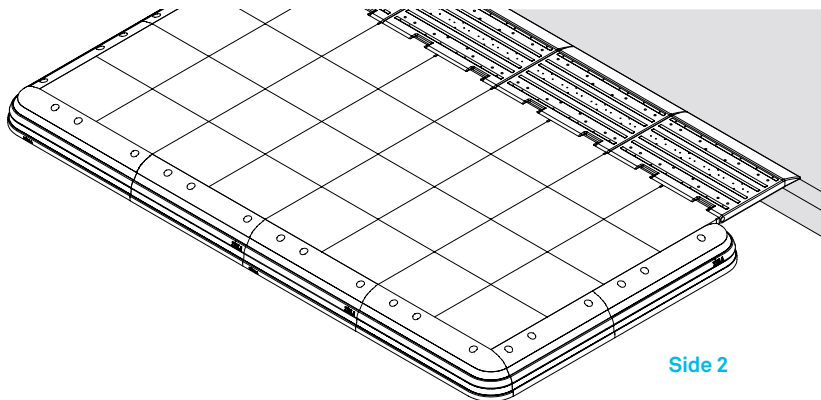
RIGHT CURB SECTION ^{x1}



8. Installing the Bus Platform

10. Installing the CURB SECTIONS on Side 2

The CURB SECTIONS of side 2 are connected to the MAIN MODULES and anchored to the road surface. It must be noted that in order to finish the installation of this side, a LEFT CURB SECTION must always be installed next to the RAMP TO SIDEWALK.



x1
MIDDLE CURB SECTION
cut

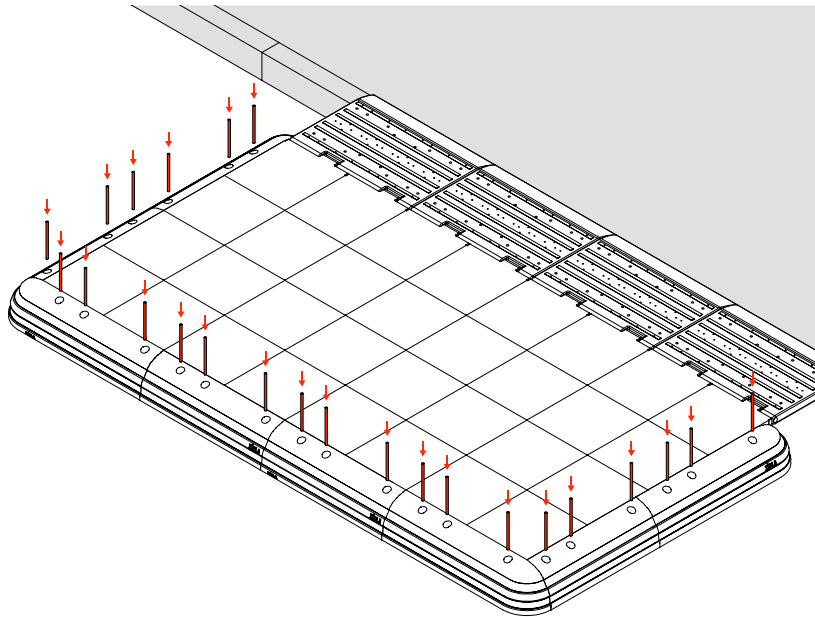


x1
LEFT CURB SECTION

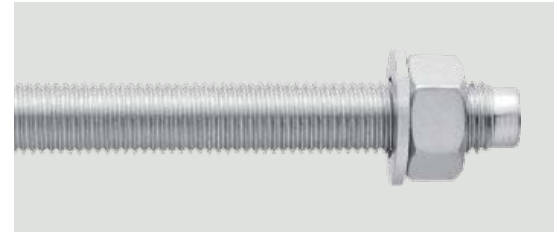


8. Installing the Bus Platform

Finally, the CURB SECTIONS are fixed to the road surface with the proper anchors.



x24
Anchors
8 21/32 in

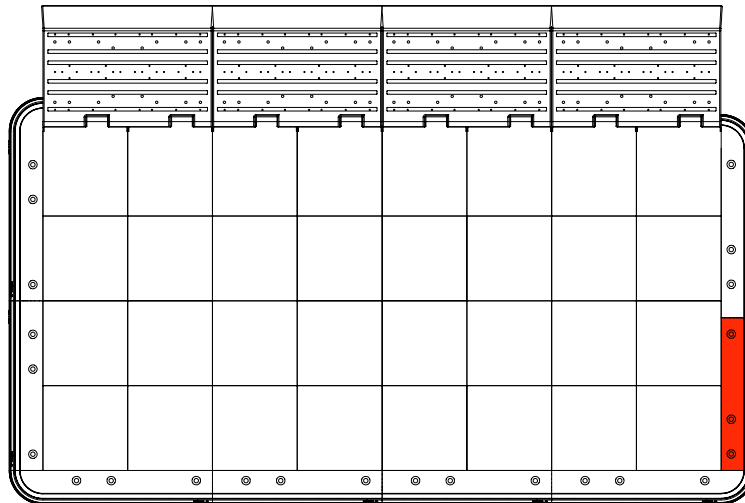


8. Installing the Bus Platform

11. Cutting CURB SECTIONS

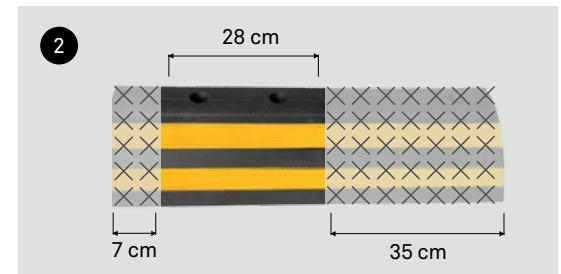
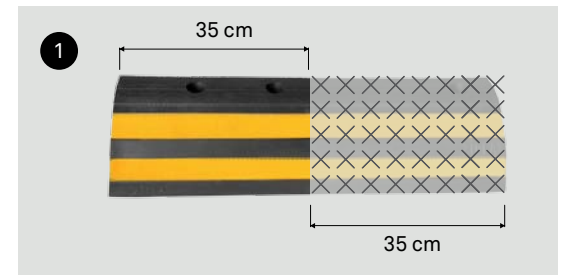
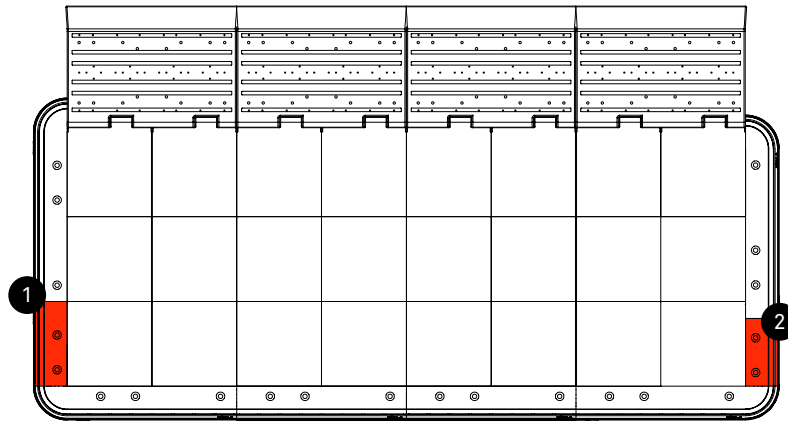
If the number of MAIN MODULES is odd, either lengthwise or widthwise, it will be necessary to cut one of the CURB SECTIONS with a circular saw to enclose the platform correctly.

Bus Platform with an even number of rowst



8. Installing the Bus Platform

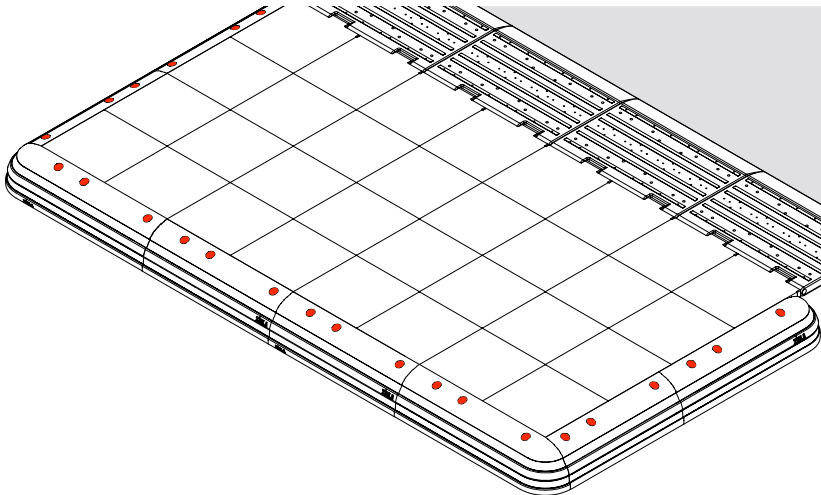
Bus Platform with an even number of rows



8. Installing the Bus Platform

12. Placing CURB anchors tops

Once the CURB anchors have been installed, the anchor holes must be covered up with the tops supplied in order to protect the anchors from corrosion.



x24
Tops

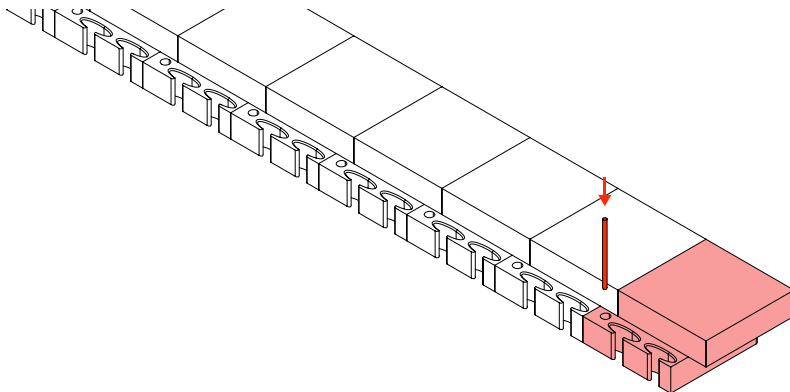


8. Installing the Bus Platform

Installing the isolated Bus Platform with RAMP TO ROAD

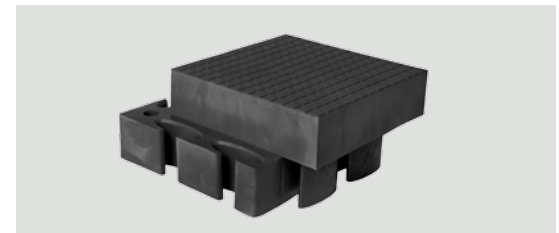
1. Installing the first row

When installing the isolated Bus Platform, it is important to take special care of the direction of the modules that will make up first row.

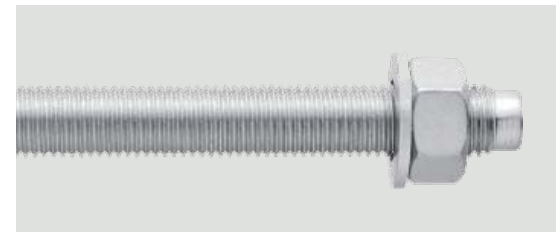


The interlocking part of MAIN MODULE must face the middle of the road. Once the alignment of this first row is ensured, the anchors must be installed, though only for the modules that will be in contact with the access ramp. As the installation progresses, all the sections of that side (that connect to the access ramp) should be anchored to the road surface.

MAIN MODULE



Anchor
5 29/32 in.

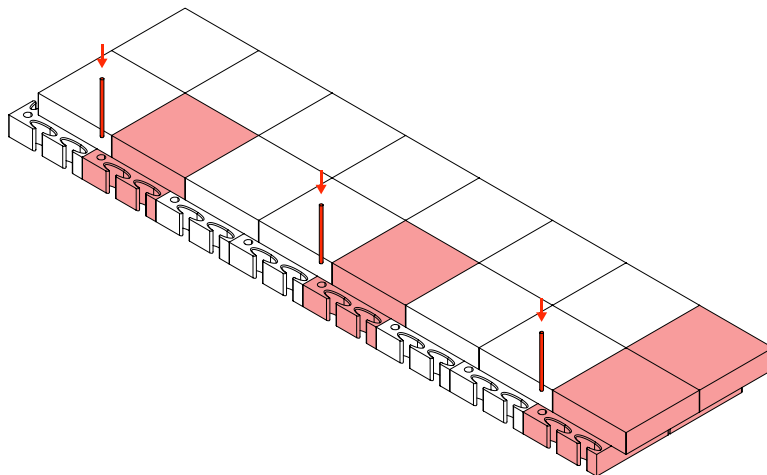


8. Installing the Bus Platform

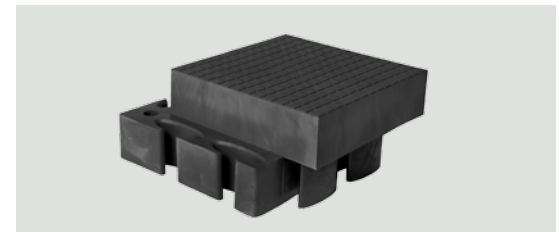
2. Installing the second and subsequent rows.

On the second row, one in every three MAIN MODULES should be anchored, starting at the ramp's side.

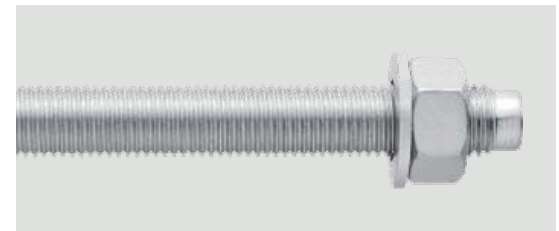
The same sequence should be followed until the width of the Bus Platform is completed: one row with an anchored module (ramp side) followed by another row with one in every three module anchored.



MAIN MODULE



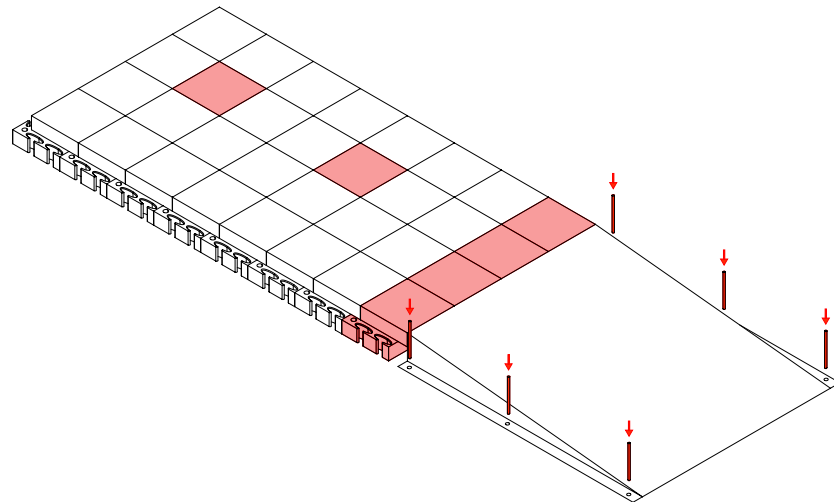
Anchor
5 29/32 in.



8. Installing the Bus Platform

3. Installing the access ramp from road level.

Once the main sections have been installed, the ramp will be attached and anchored. The latter is always positioned in a way that allows the user to access the Bus Platform in the same direction as the traffic.

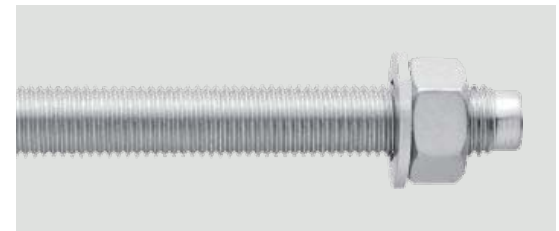


3 5/32 in. diameter and 3 5/32-3 15/16 in.-long anchors must be used. The number varies depending on the ramp's length.

RAMP TO ROAD



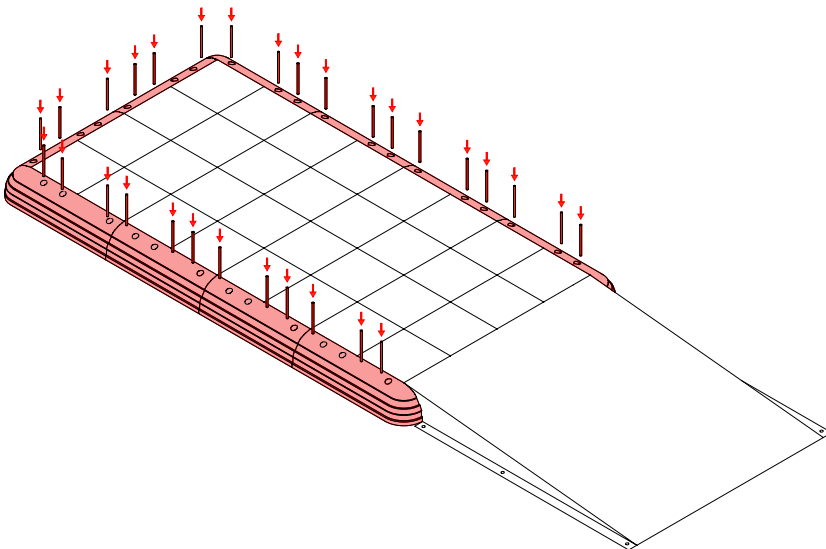
Anchor
3 5/32-3 15/16 in.-long



8. Installing the Bus Platform

4. Installing the CURB SECTIONS

The next step is to attach and anchor the CURB SECTIONS.



MIDDLE CURB SECTION



LEFT CURB SECTION

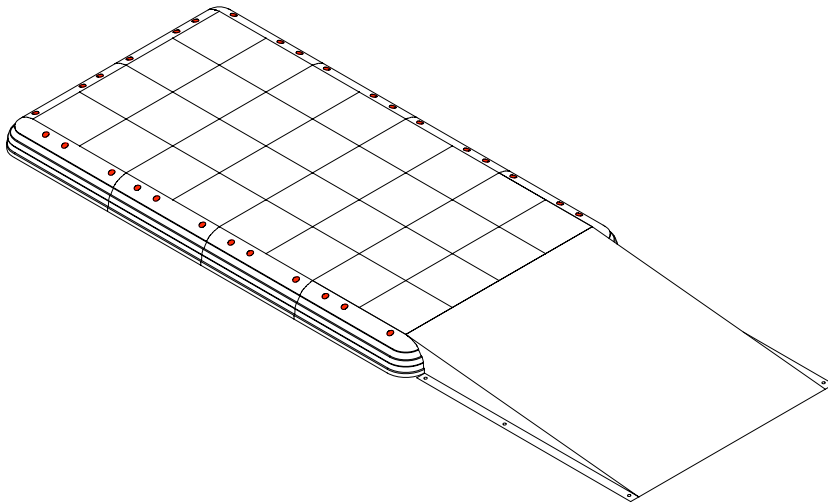


RIGHT CURB SECTION

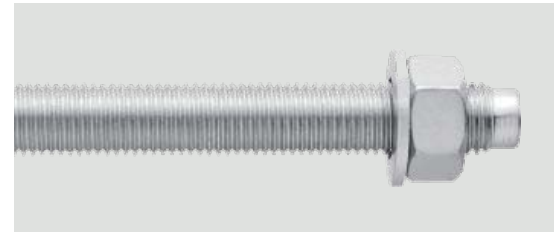


8. Installing the Bus Platform

Finally, the tops to cover the holes should be inserted.



Anchors
8 21/32 in.-long



Tops



8. Installing the Bus Platform

Installation time of the Bus Platform

The average time for installing a Bus Platform of 39 ft. 8 in. x 6 ft. 8 in. is 3½ hrs for a team of 3, and 5½ hrs for a team of 2.



9. Removal and Reinstallation the Bus Platform

If it is necessary to remove a Bus Platform because of a change of location, on-street public works or for repair, it is very easy to do so thanks to the following properties that were determined in the design stage:

- A** Reversibility of the joins
- B** Easy access to the joins
- C** Modular design of interconnecting sections.
- D** Only three different components: RAMP TO SIDEWALK, MAIN MODULE and CURB SECTION.
- E** Light weight of the sections: 26 lb. 7 oz. at most, which makes them easy to handle without the need of special equipment.

The Bus Platform components are reusable and can be reinstalled countless times.

In addition, the PVC parts of the Bus Platform are recyclable, so that when END OF LIFE approaches, they (are) can be reincorporated into industrial processing to be reused again.



10. Bus Platform Certificates and Awards.

Design for Recycling Award

This award, granted by the Catalan Government recognizes the products, projects, strategies and materials that include in their design: residue prevention criteria, use of recycled material or the improvement of its recyclability; and that were created, implemented and/or distributed, according to category, in Catalonia.



“Design For All, Good Practice” Award

The panel of the Design for All International Award chose the Bus Platform in 2014 as a “GOOD PRACTICE” in the “Category of products, services and environments already in use”.

Design for All Awards recognizes the examples of GOOD PRACTICE that arise when working solutions are provided for identified needs and problems of users; they honor people that meet the established criteria of excellence.



10. Bus Platform Certificates and Awards.

Emblem of Guarantee of Environmental Quality

The Bus Platform has earned the Emblem of Guarantee of Environmental Quality awarded by the Catalan Government. This emblem consists of an eco-label used to identify products & services that surpass environmental quality requirements established by current legislation.



Carbon footprint

In 2013, the Cyclus company prepared the CARBON IMPRINT STUDY of ZICLA's Bus Platform for the Catalan Government. It followed the PAS 2050:2011 methodology of the British Standard Institute. The study also kept in mind the EN ISO 14040-44 Life Cycle Analysis methodology of "business to consumer". This considers life cycle stages such as production of raw materials, preparation and manufacture of the final product; distribution of the finished product and installation; removal and end of life management.

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