



INSTALLATION GUIDE FOR URBACO SAFETY LOOPS

GARANTEE :

The installation and civil engineering contractors who install URBACO products are entirely responsible for the installation and conform to the guidelines regarding the prescribed situation of each site, be it geological or architectural.

The product guarantee is valid only if the installation guidelines are respected and are in accordance with URBACO general terms and conditions.

In the event legal action is taken; an engineering and design department must perform a concrete study. This department will, if necessary, analyze the quality of the concrete by the specimens obtained by core sampling, and will verify that installation guidelines were followed.

If it is concluded that the installation is incorrect, the guarantee will be immediately revoked and the Project Manager will be informed of the incomplete installation. He will then be obligated to rectify the mistakes by resuming the installation and repairing the site according to the agreed specifications.

Analyses and study costs will be the responsibility of the ordering company.

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1 GENERAL PRESENTATION OF A CONTROLLED ACCES

A controlled access usually involves three or four sets of equipment, which all link together with electric wires and a pneumatic or hydraulic line.

- **Safety loops** offer electromagnetic detection. Installed in the ground before and after the bollards, they provide information on the presence or absence of vehicles near the bollards. Two or three loops operate according to the function of access (controlled entrance, free or automatic exit). They are a major part of the safety system.
- **Automatic retractable bollards**, installed across the traffic lane, allow or deny access (one or two bollards for a standard configuration). Consult our engineering department for other configurations.
- **The control system:**
 - access controller with **built in technical center** (model City 3 or City 5 or micro technical center),
 - access controller model City and **separated technical cabinet**.

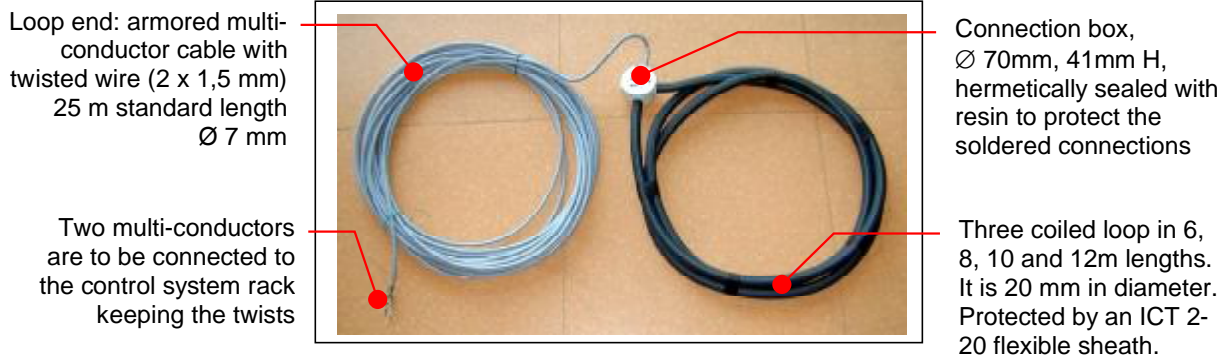
The control system gets instructions from the operator/user by remote control, proximity card, push button, etc. It manages the access typically by PLC and supplies the energy to operate the bollards with pneumatic compressor or a hydraulic pump. Works with 220 VAC (16 A + ground) power for standard European versions and is also available in 110 VAC.

For retractable bollard installation and control system installation (technical center, City controller), please see the appropriate manual.

Safety loop layout is very important for the proper functioning of the access. Therefore, **it is recommended to first determine loop positioning**, and then proceed with bollard and controls positioning.

2 SAFETY LOOPS

2.1 Présentation



The safety loop is made of a flexible, electrical multi-conductor cable, including several coils (3 twists). Placed into the ground (asphalt, concrete, etc.), that cable is sheathed to ensure its mechanical and thermal protection during surface finishing.

The loop acts as a **transducer** and is linked to the control box and makes the no-contact detection system for metallic objects.

The loop end links the loop to the detector. It is made of a 2 x 1.5mm² armored multi-conductor cable with twisted wire (**minimum 10 twists per meter to the detector**). This specification is **imperative**.

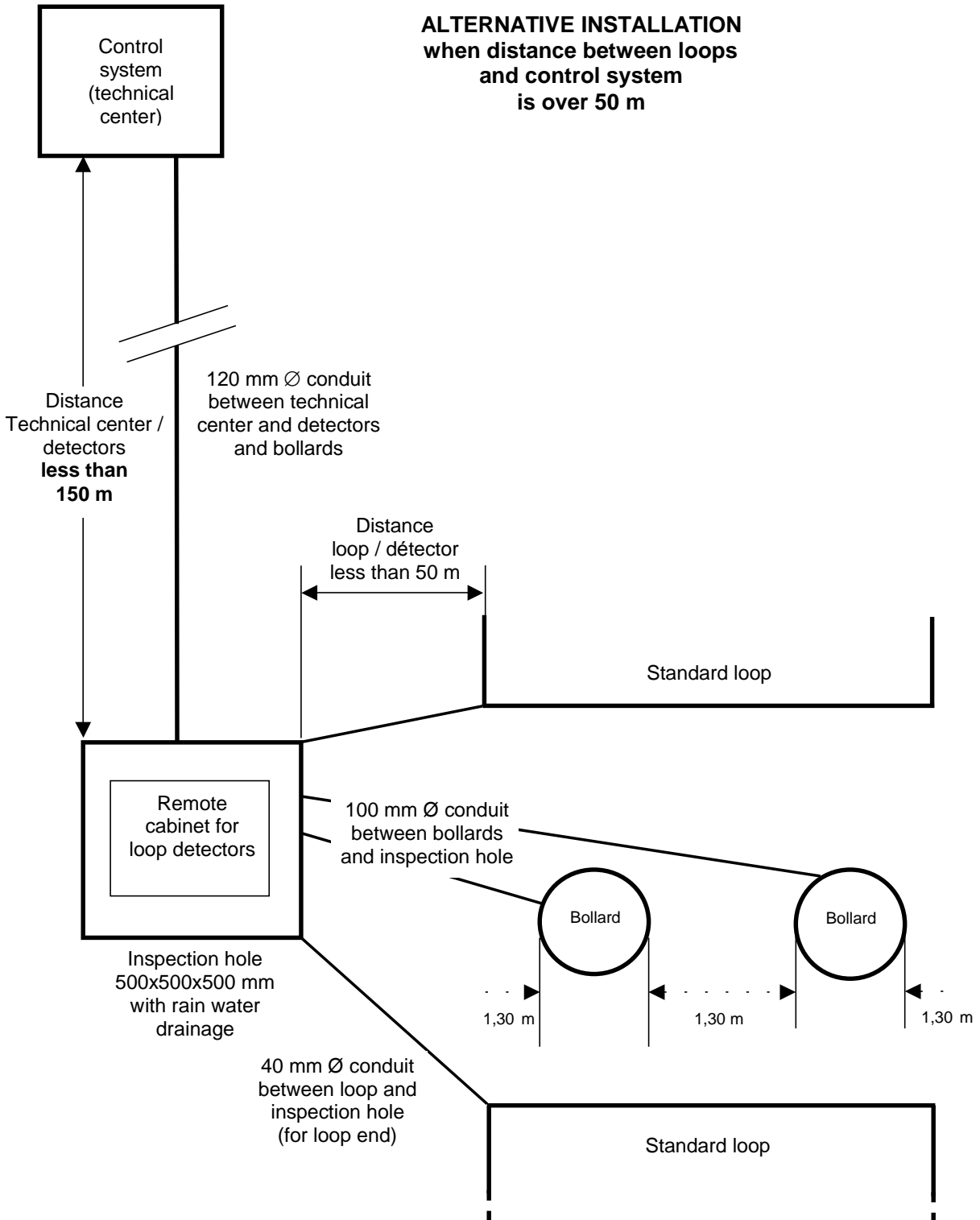
The use of armored cable (**not linked to the ground**) is necessary if several loop ends are buried in the same trench or in a disturbed environment. They must be as short as possible (50m maximum between the loop and the detector) and made of a low inductance per meter wire (about 0.73 µH).

Loops must not be installed close to other cables, wires or electrical sources that might cause interference such as power lines.

Note: Our standard loops are delivered with a standard 25m loop end. Loop ends can be shortened from the free end. If an extension is needed (same kind of wire and 25m long maximum), wires will have to be soldered. Soldering must be protected by hermetic boxes filled in with resin.

If the distance between the safety loop and the control system is over 50m, detectors must be installed in a cabinet close to the loop.

Our URBACO loops are perfectly compatible with our 8613S remote detectors or with our built-in 8633B detectors.



2.2 Electrical specifications of the loops

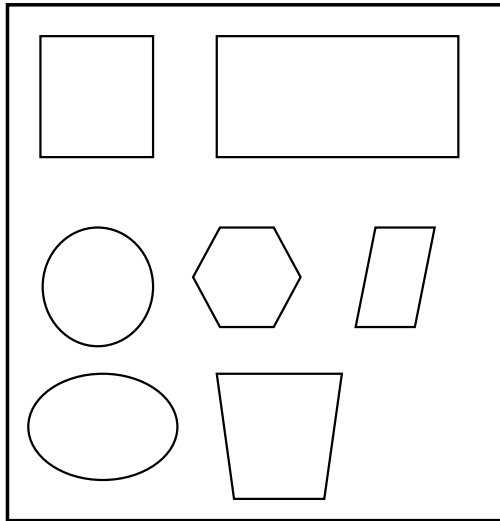
Inductance: Equivalent inductance at the detector should be between 50 and 250 μ H.

Resistance: Resistance at the detector must be less than 10 Ω .

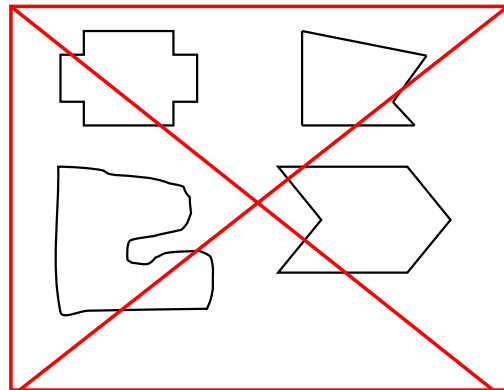
Insulation: Insulation to the ground must be over 10 M Ω .

2.3 Geometrical specifications of the loops

Authorized loop shapes



Prohibited loop shapes



CAUTION: Loops with returning angles are prohibited.

Different sizes of loops may be used as long as their perimeter is between 6m (2m x 1m rectangle for example) and 14m.. All loops must contain 3 coils. Urbaco standard loop sizes are 6, 8, 10 and 12 meters.

2.4 Rules for the loop layout

- R1** Minimum distance between two loops: 600mm
- R2** Minimum distance between a loop and a retractable bollard (on center) situated outside the loop: 800mm.
- R3** Minimum distance between the loop and a fixed metallic object outside the loop: 300mm for a manhole cover, 100mm for a post or a barrier.
- R4** Keep the loop from surrounding metallic elements, especially if they are moving (a retractable bollard for example). If it is impossible, center the element as much as possible. In all cases, leave at least 300mm between the loop and the perimeter of the metallic object. Check for any interference, even during thunderstorms.
- R5** Loop trench **must not contain anything** but the loop, and must not be closer than 100mm to other trenches i.e., trenches that would be used for other loop ends.
- R6** Several loop ends may be installed in the same trench, even close to metallic objects. Nevertheless, the trench must not contain other conductors that might cause interference (power lines).

- R7** Make sure no electrical lines run close to the loop site.
 - If there is a low or medium voltage line (from 120 to 5000 VAC) near the site, it must be at least 2m away.
 - If there is a **high voltage line** (more than 5000 VAC) near the site, it must be **at least 10m away**.
- R8** Twist the loop ends to the loop control device rack (at least 10 twists per meter).
- R9** Several loop ends may be installed in the same trench, even close to metallic objects. Nevertheless, the trench must not contain other conductors that might cause interference (power lines).

Illustration of the rules 1 - 8

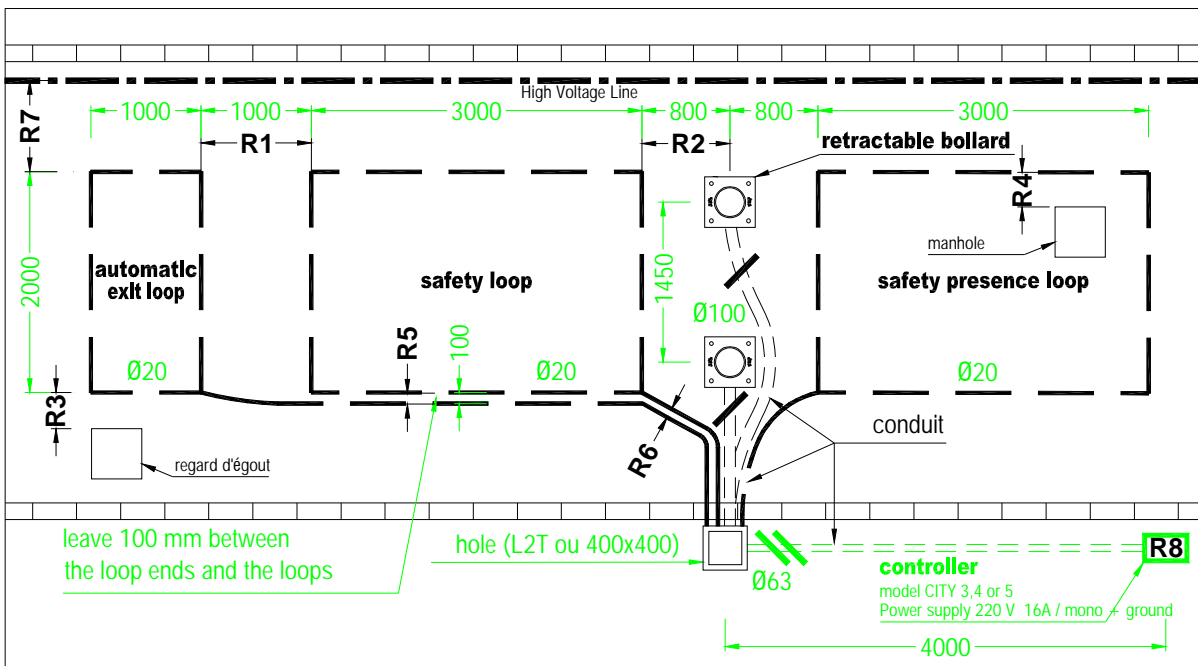
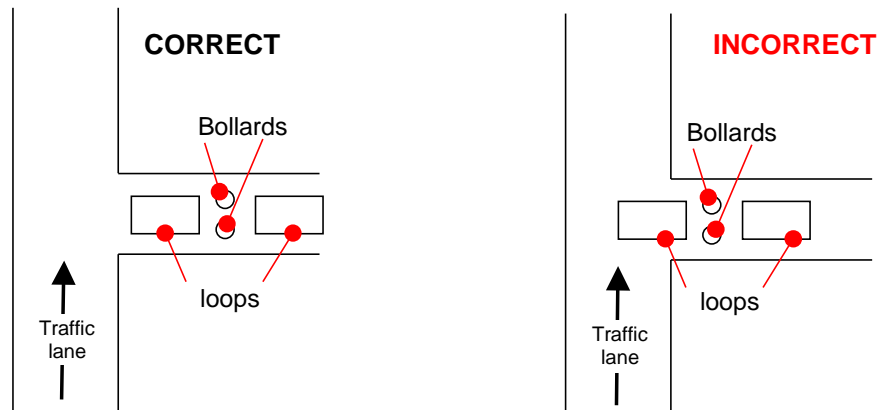


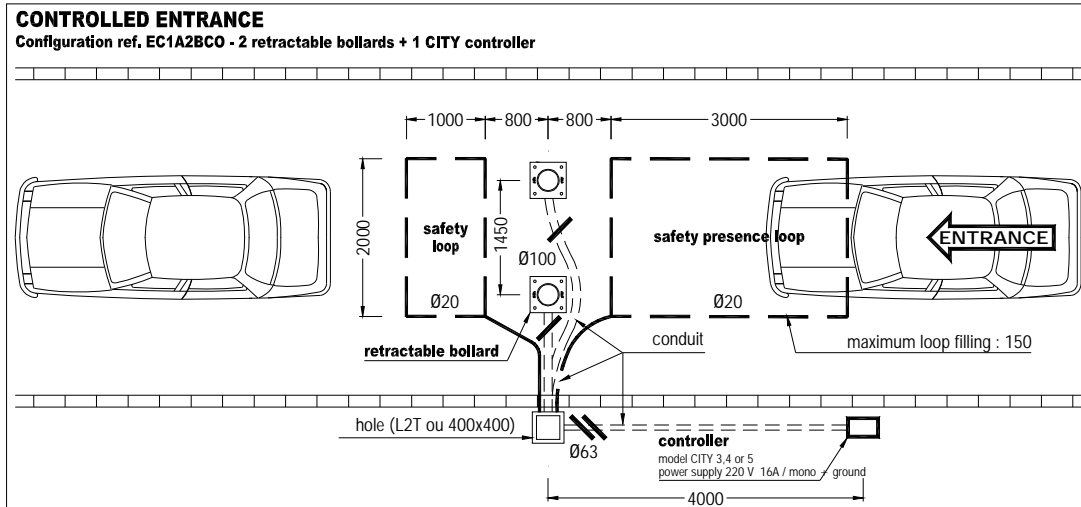
Illustration of the rule 9



2.5 Rôle of the loops according to the access configuration

Example of some standard configurations:

C1 One way controlled entrance: 2 loops , 2 bollards, 1 way.

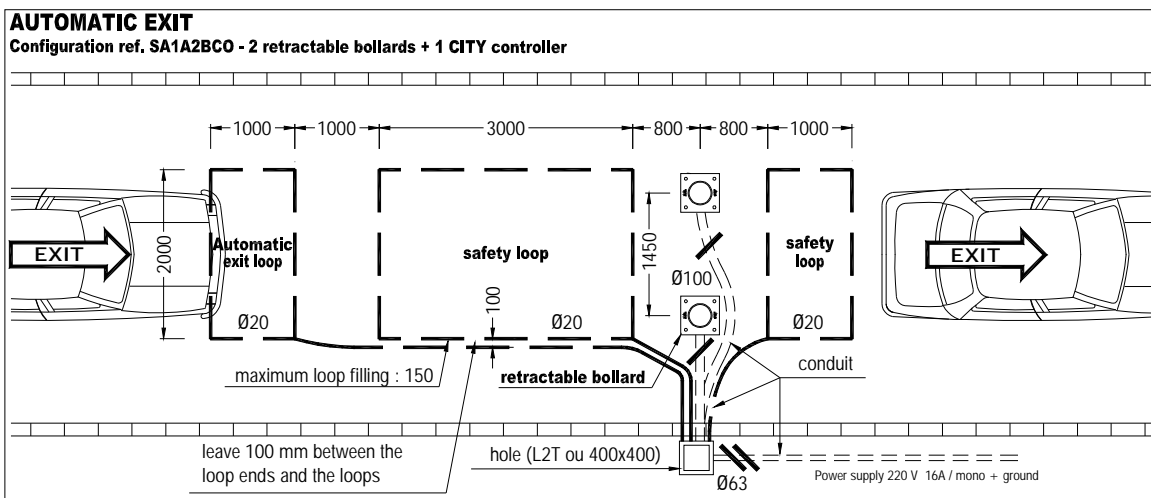


Two loops, one on each side of the bollards. The loop on the entrance side acts as a presence loop for the approaching vehicle and allows the opening of the access by radio transmitter, proximity card, etc.

Both act as safety loops for the detected vehicle. The access stays open, and bollards are in the downward position until the loops are free.

This one way controlled access can be either a controlled entrance or a controlled exit.

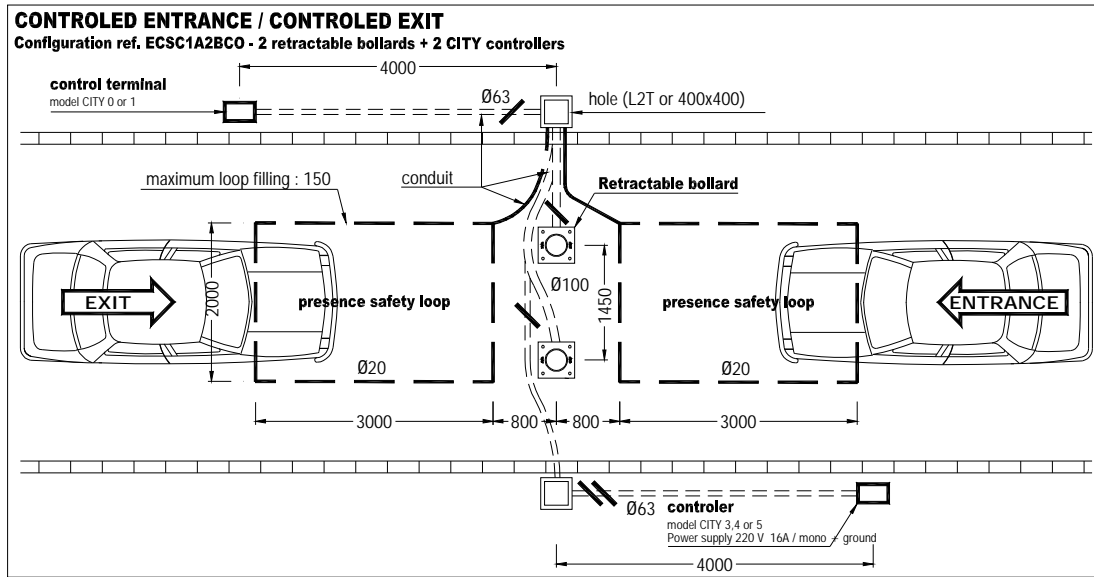
C2 One way free exit : 3 loops, 2 bollards, 1 way.



Two loops before the bollards, one loop after. The first activated loop allows opening of the free exit. The presence of a vehicle over the loop commands the opening.

The two other loops act as security loops. The access stays open and the bollards are in the downward position until the loops are free.

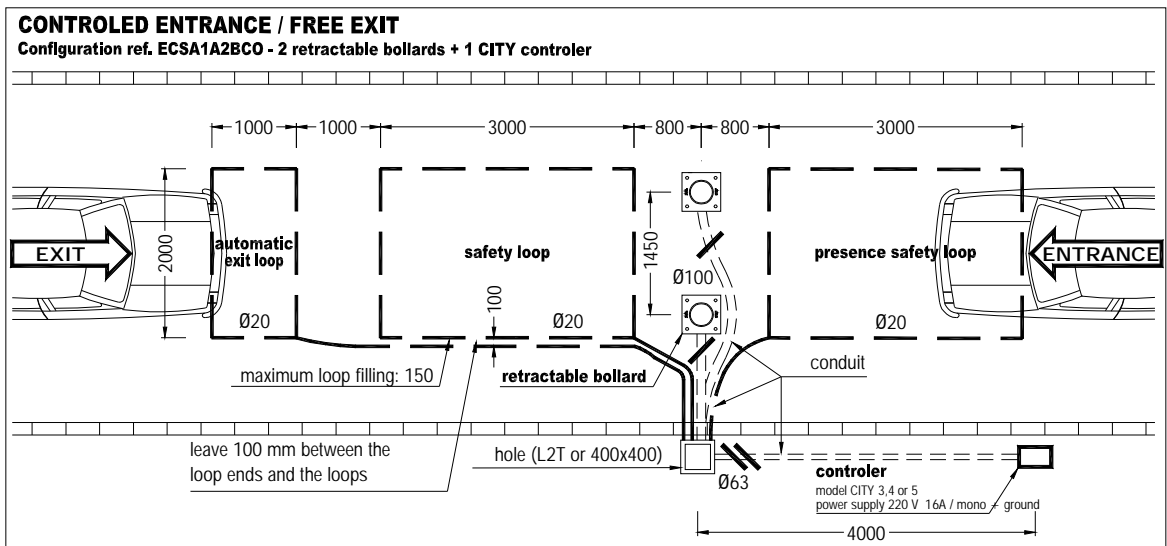
C3 Controlled entrance, controlled exit, one lane: 2 loops, 2 bollards, 1 lane



Two loops, one on each side of the bollards. Each one acts as a presence loop for the approaching vehicle and allows the access to be opened by radio transmitter, proximity card, etc.

Both of the loops act as safety loops for the vehicle regardless of the traffic direction. The access stays open and the bollards remain in the downward position until the loops are free.

C4 Controlled entrance, free exit, one lane : 3 loops, 2 bollards, one lane.



One loop for the entrance side, two loops for the free exit side of the access. The first activated loop allows the opening of the free exit. The presence of a vehicle over the loop commands the opening.

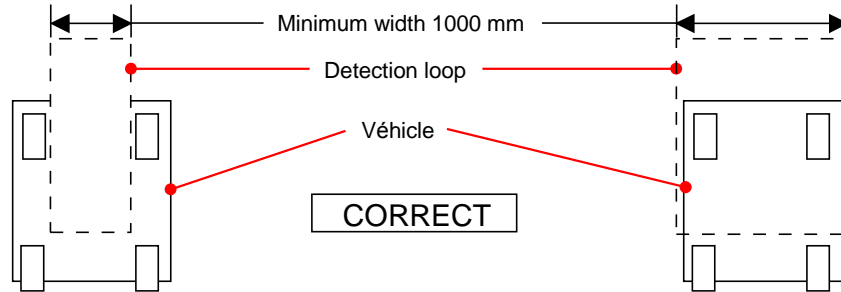
The two other loops act as safety loops for the vehicle, regardless of the traffic direction. The access stays open and the bollards remain in the downward position until the loops are free.

The loop on the entrance side also acts as a presence loop for the approaching vehicle and allows the access to be opened by radio transmitter, proximity card, etc.

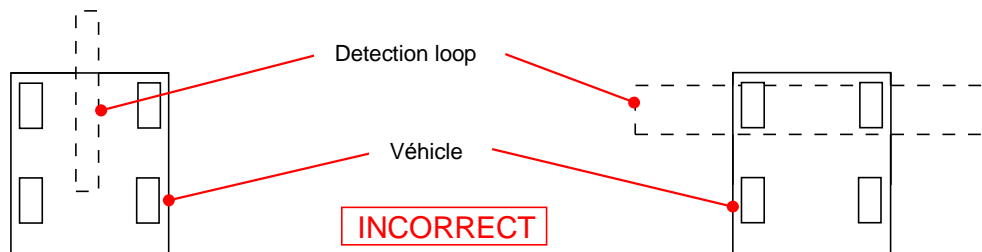
3 LOOP INSTALLATION

3.1 Safety loop dimensions

The loop width must be adapted to the size of the vehicles that must be detected. Maximum sensitivity will be reached if the vehicle is just a little wider than, or just as wide as the loop:



The two following layouts are possible, but not recommended as the loop could be too narrow or it could be perpendicular to the flow of traffic. In both cases we claim no responsibility for malfunctions or improper detection:



3.2 Burial specifications for the safety loops

Once the shape of the loop is determined, a trench must be dug (25mm wide and 100mm deep) in the ground surface. The bottom of the trench must be covered by a layer of sand that is 20mm deep.

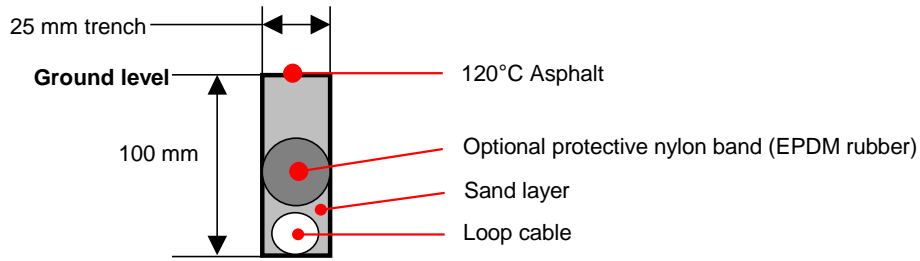
The loop wire must be installed as deep as possible in the trench. It must be between 50 and 150mm deep from the ground surface and as steady as possible. The loop wire must be covered by another layer of sand that is 20mm deep.

A protective nylon band (EPDM rubber) may then be installed. The finishing operations can now be processed (mortar, epoxy resin, asphalt, etc.).

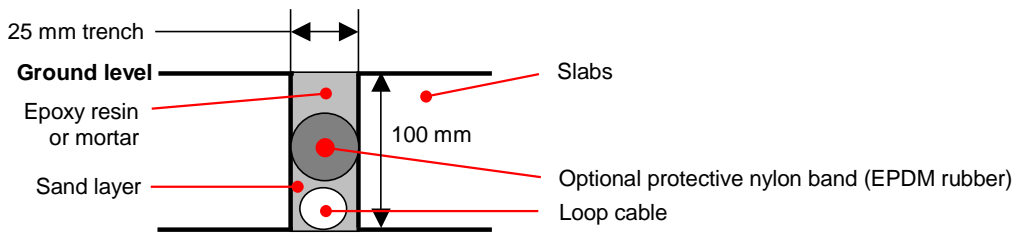
Loop ends are installed in a trench that is 12mm wide and over 50mm deep. There is no limit for the depth and several loop ends can be installed in the same trench (see rule R6).

The ends are covered with sand to ensure their mechanical and thermal protection during surface finishing.

3.2.1 In an asphalt setting (cut view)

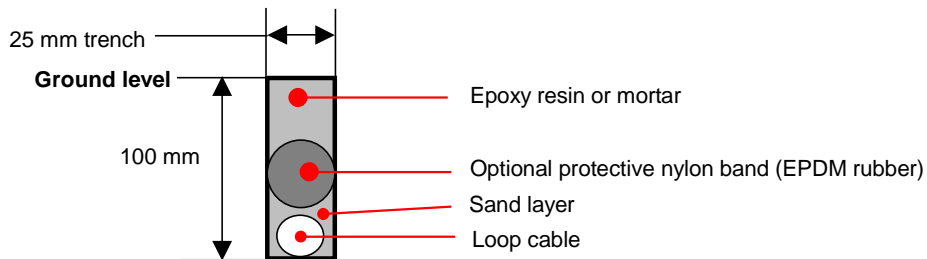


3.2.2 Inside pavement joints (cut view)



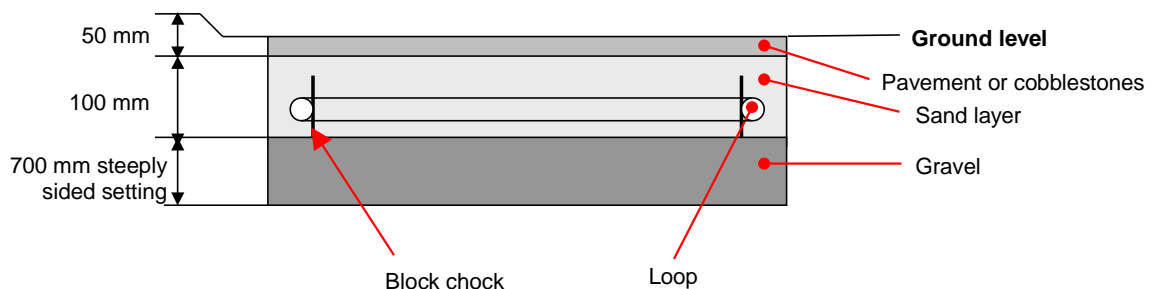
In this application a protective geotextile sheath can be installed to protect detection wires.

3.2.3 In concrete (cut view)

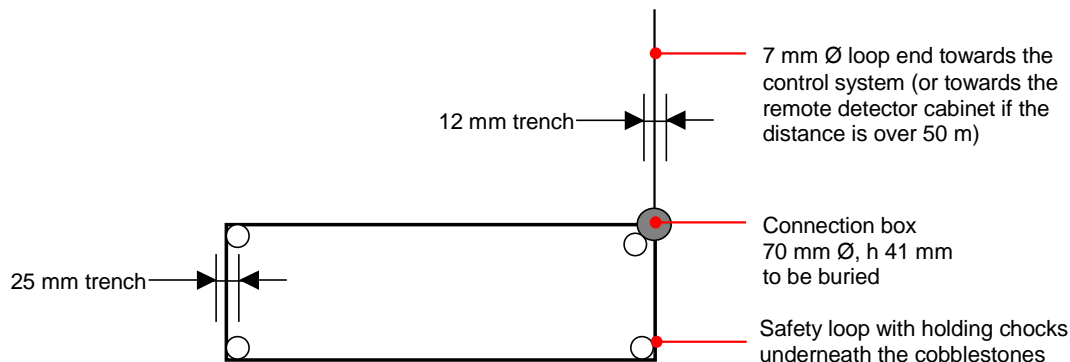


3.2.4 Underneath cobblestones or stone slabs (cut view)

The corresponding loops must be installed in the sand between the gravel pad and the cobblestones.



3.3 Plan view



In order to maximize the layout of the different loops, holding chocks or reinforcements must be placed at the four corners. The loop is then placed inside the sand and is fixed with rubber tape.

As a precaution, it is recommended to always test the resistance, insulation and impedance of the loops before and after filling in the trench.

3.4 Tests before and after filling in the drainage channel

Test with a “Q-meter”, a measuring device for impedance. Regardless of which Urbaco loop is used, the technical specifications, as stated page 6, must be applied.

Reminder:

Inductance: Equivalent inductance at the detector should be between 50 and 250 μH .

Résistance: Resistance at the detector must be less than 10 Ω .

Insulation: Insulation to the ground must be over 10 $\text{M}\Omega$.

3.5 Finishing

Once tests are completed, the pouring of asphalt, mortar or epoxy resin (or similar) can be done. While pouring, make sure the material temperature does not damage the insulation that protects the loop. That damage could cause an error in the ground insulation.

Previous tests (§3.4) must be done again.

Installation is now complete. Commissioning the control system can begin according to rules in the owner’s manual.



TRAINING SESSIONS

Urbaco is pleased to offer technical training sessions. These first level sessions last two days and the second level sessions last three days. These sessions can be conducted in French, English and Spanish.

MAINTENANCE CONTRACT

Urbaco offers a maintenance contract that will meet your needs:

Maintenance contract: Preventive maintenance.

Preferred Care Contract: Worldwide maintenance; includes travel expenses, labor, simplified maintenance budget, and urgent intervention plan.

AFTERSALES SERVICE



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