

Fixed Under Vehicle Scanning System Construction Manual

V 1.7

Table of Contents

I Device Sample Drawing Hata! Yer işareti tanımlanmamış.

II System Diagram Hata! Yer işareti tanımlanmamış.

III Construction Preparation Hata! Yer işareti tanımlanmamış.

IV Construction and Installation Guidance Hata! Yer işareti tanımlanmamış.

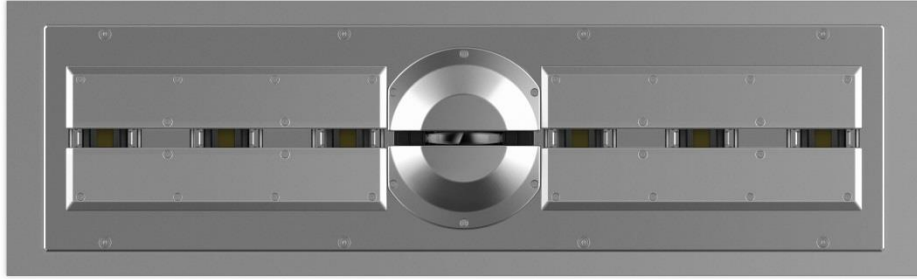
V Construction Process Hata! Yer işareti tanımlanmamış.

VI Appendix 1 Bill of Materials Hata! Yer işareti tanımlanmamış.

VII Appendix 2 Construction Photos for Reference Hata! Yer işareti tanımlanmamış.

VIII Appendix 3 General Proposals for Reference Hata! Yer işareti tanımlanmamış.

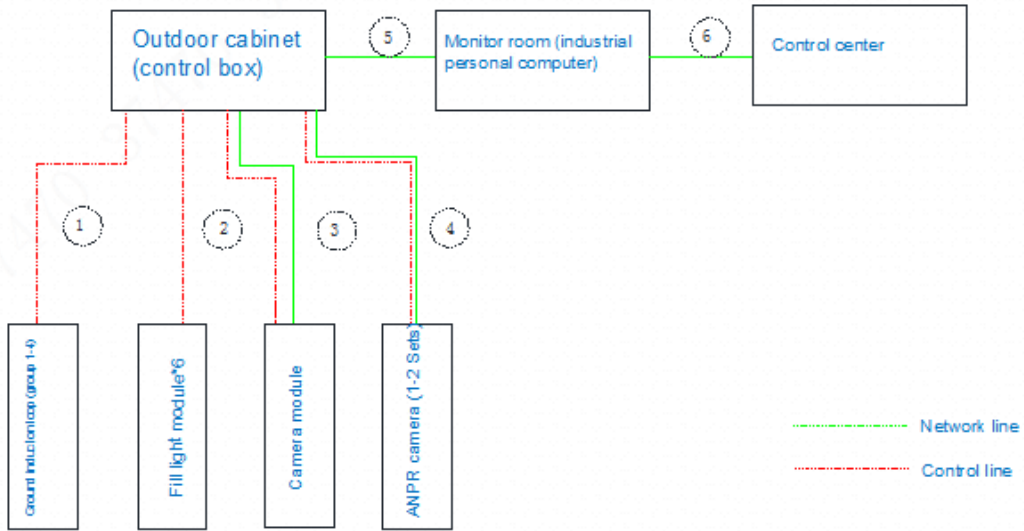
I Device Sample Drawing



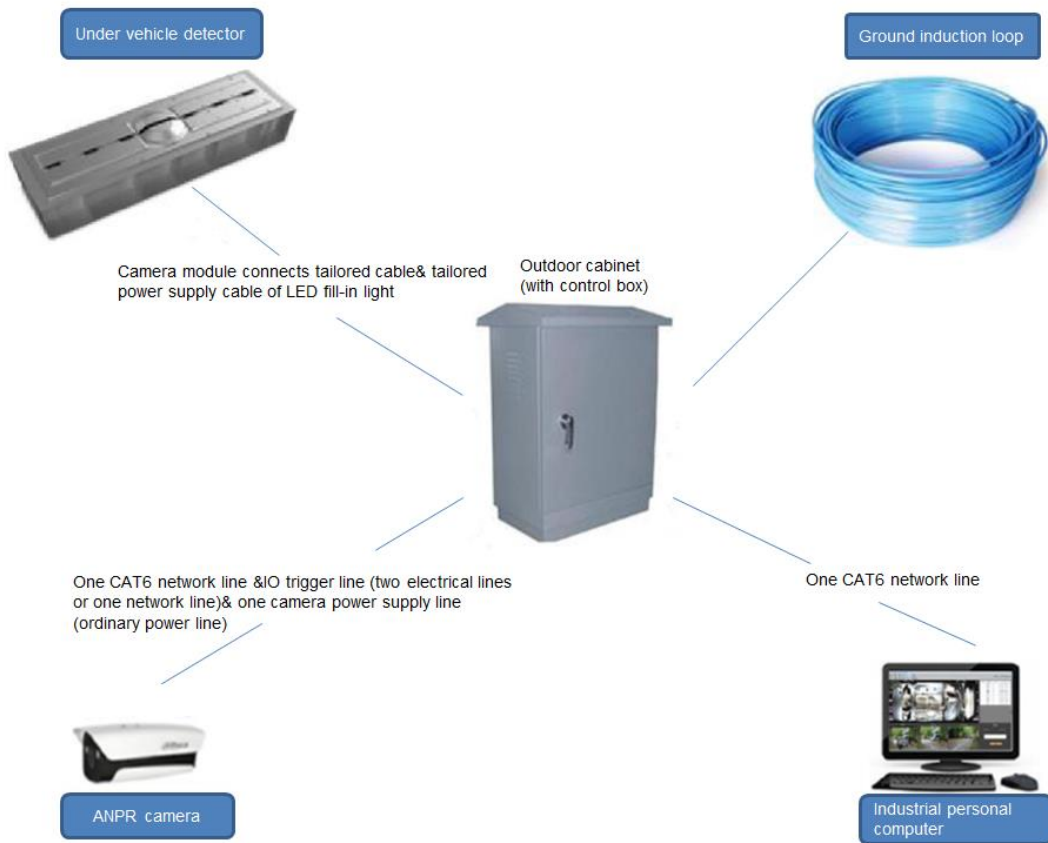
II System Diagram

This is a management system based on the license plate. The vehicle chassis image is acquired via the linear scanning imaging system of the vehicle chassis when the vehicle is passing through the entrance and exit, which makes it convenient for security staffs to identify suspicious objects. Meanwhile, the vehicle license plate information can be extracted automatically via video analysis, and then it will make auto-match between vehicle license information and vehicle chassis picture and keep it archived. The system has changed from traditional manual vehicle chassis detection to auto imaging, which can greatly improve the passing efficiency of the entrance and exit.

The system consists of two parts which are front-end device and back-end platform. The front-end device realizes data acquisition and device hardware control, while the back-end platform management software implements data management and application. Taking single lane proposal as an example, its structure is shown in the following figure.

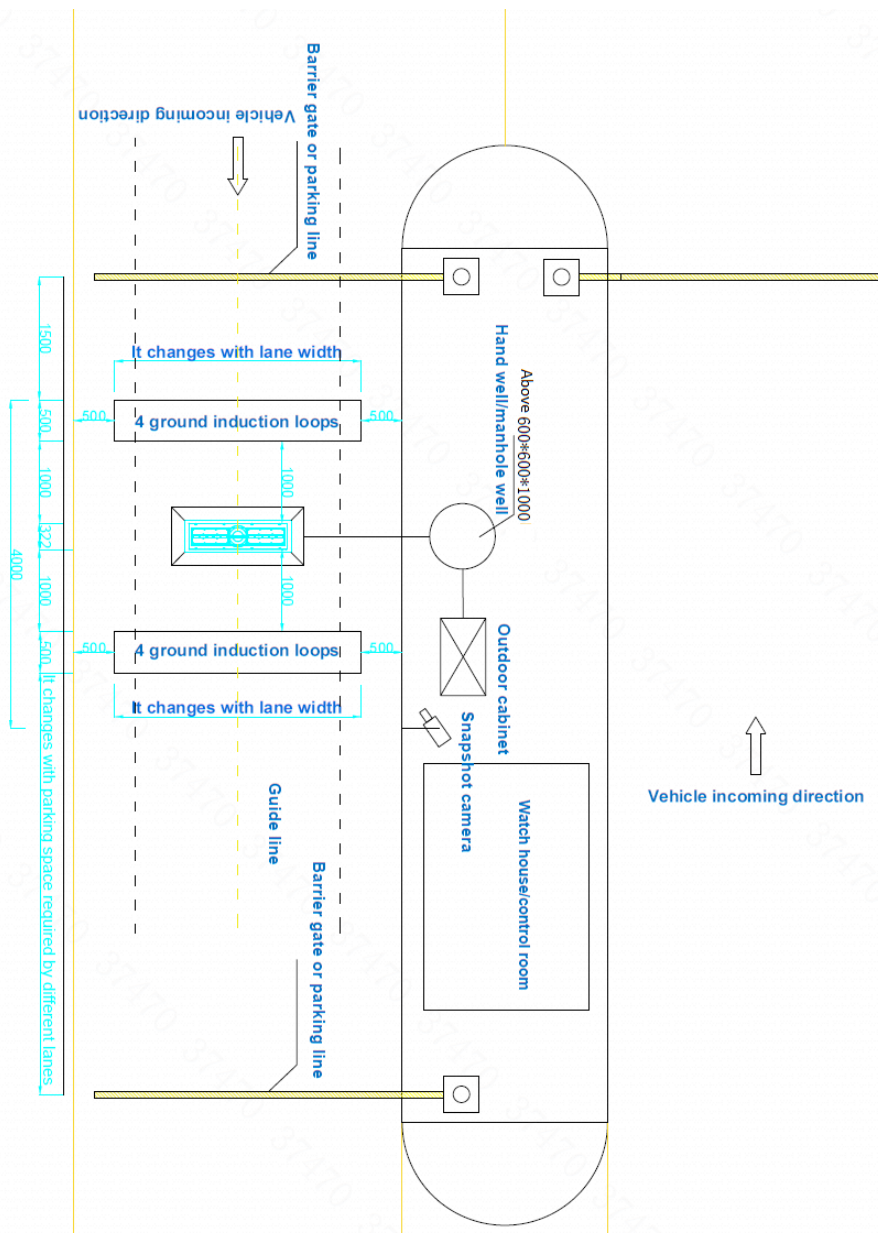


UVSS Device Framework Diagram



UVSS Device Composition Diagram

III Construction Preparation



For basically all installation routines, we can refer to above effect planar graph, but different installation sites may be affected by geographic position and environment. Arrangement distances among all parts will be different. Therefore, before installing fixed underside vehicle intelligent scanning detection system, we need to confirm the following

contents:

- 1) Widths of relevant lanes to install UVSS.
- 2) Vehicle types and maximum vehicle length that is planned to pass relevant lanes.
- 3) Outdoor environment, including extremely cold and extremely hot temperature; frequent rainstorms or not; severe sand and dust weather and so on.
- 4) Generally, the customer is required to install outdoor cabinet beside channels (for example, corresponding safety island, within green belt and isolation belt etc.). Wiring distance between outdoor cabinet and UVSS main component shall be less than 8M; over 600*600*1000 manhole well shall be digged at the same horizontal level with UVSS main component, in order to facilitate wiring, place surplus cables and drain away water. In case that the cabinet cannot be placed at routine positions due to geographical conditions or other factors, the customer shall provide specific available position to place the outdoor cabinet, as well as wiring distance between vehicle chassis scanner and outdoor cabinet.

Note: it is suggested that one UVSS system shall have one manhole well.

- 5) UVSS main component shall be installed at the center of the lane. If there is a barrier gate in the front of the lane, the distance between

barrier gate and ground induction loop (out) changes depending on parking space of different lanes. In principle, there is a bodywork length from barrier gate to vehicle chassis. Generally, it is suggested that the distance should be over 8M for small vehicle lane, over 13M for passenger car lane and over 20M for large vehicle lane.

If this lane needs to install a vehicle check-in system, the distance between vehicle check-in system and ground induction loop (out) changes depending on parking space of different lanes. In principle, there is a bodywork length from vehicle license system to vehicle chassis. Generally, it is suggested that the distance should be over 7M for small vehicle lane, over 12M for passenger car lane and over 19M for large vehicle lane.

Engineering Exploration Table of UVSS Installation Site			
Project name		Project place	
Exploration time		Explorer	
Device installation environment (with photos)	<input type="checkbox"/> Security checkpoint	<input type="checkbox"/> Prison	<input type="checkbox"/> Airport
	<input type="checkbox"/> Customs	<input type="checkbox"/> Other_____	
Road planning drawing	<input type="checkbox"/> Please provide		
Road exists already or has been laid	<input type="checkbox"/> Road has been laid	<input type="checkbox"/> Road has not been laid, please provide completion plan	
Road laying type	<input type="checkbox"/> Concrete	<input type="checkbox"/> Asphalt	<input type="checkbox"/> Other_____
Vehicle type of the planned road	<input type="checkbox"/> Sedan car	<input type="checkbox"/> Commercial vehicle	<input type="checkbox"/> Passenger coach
	<input type="checkbox"/> Truck and trailer	<input type="checkbox"/> Other_____	
Max. bodywork length			
Lane snapshot (bilateral direction)			
Width of single lane	_____M		
Safety island/road barrier between two adjacent lanes	<input type="checkbox"/> Safety island	<input type="checkbox"/> Road barrier	<input type="checkbox"/> Other_____
dimension of safety island/road barrier	_____		
Installation layout of relevant road devices	<input type="checkbox"/> Please provide		
Install barrier gate	<input type="checkbox"/> Yes. Please provide installation position, brand and model.	<input type="checkbox"/> No	
Install vehicle check-in system	<input type="checkbox"/> Yes. Please provide installation position, brand and model.	<input type="checkbox"/> No	
Canopy size	_____M * _____M	<input type="checkbox"/> No	
Outdoor temperature	Min. temperature: _____	Max. temperature: _____	
Rainstorm and rainy weather	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Sand and dust weather	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

IV Construction and Installation Guidance

According to on-site conditions, design specific installation positions and cable direction of UVSS main component, outdoor cabinet, ground induction loop, ANPR camera and all pipeline devices. Firstly, determine embedding position of UVSS main component according to on-site conditions. Generally, consider the following factors:

1. Channel width

Calculate position of center line of the lane in accordance with lane width. Embed the device at the overlap position of center line of UVSS main component and center line of the lane.

2. Length of the vehicles in lane

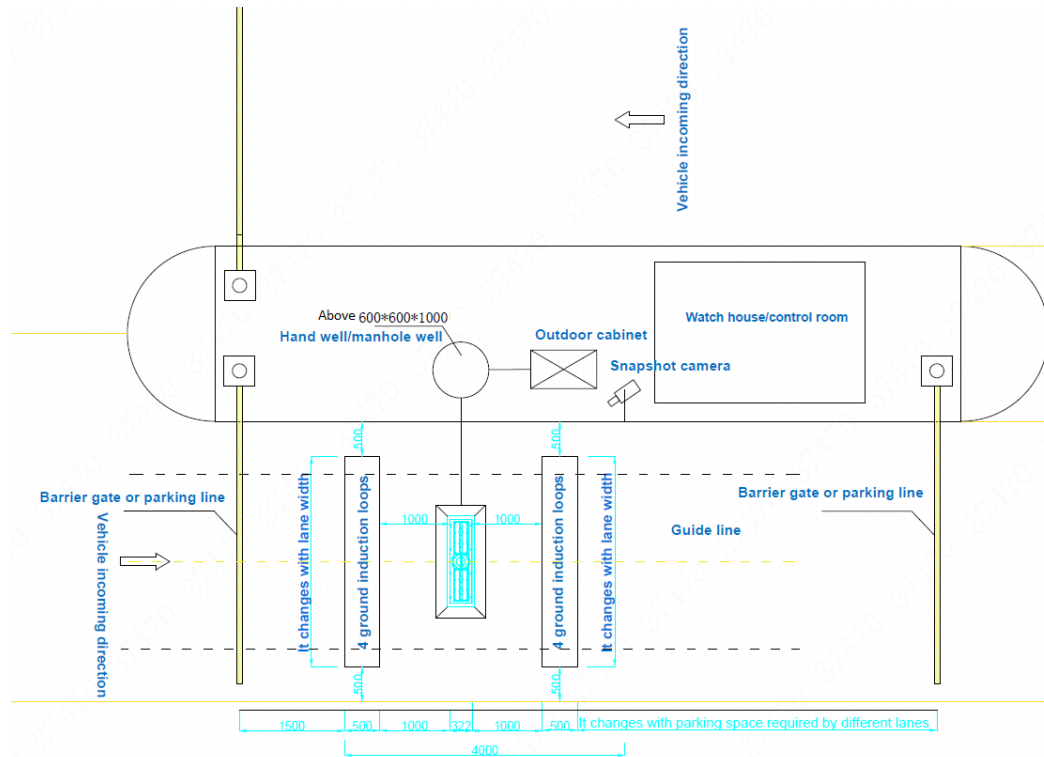
To scan chassis information of all the entering vehicles, it is necessary to make a statistics of the maximum length of vehicle entering the lane, so the distance between rear ground induction loop and release barrier gate shall be more than length of the longest vehicle. Generally, it is suggested that the distance should be over 8M for small vehicle lane, over 13M for passenger car lane and over 20M for large vehicle lane.

3. Underground pipeline and cable laying of the channel

Embedding position of the system shall avoid underground pipelines and power cables, and stay away from interference sources.

After determining the embedding position of main component,

according to relative position, determine specific installation positions of ground induction loop, ANPR camera and outdoor cabinet. For layout of every part, please refer to the following chart:



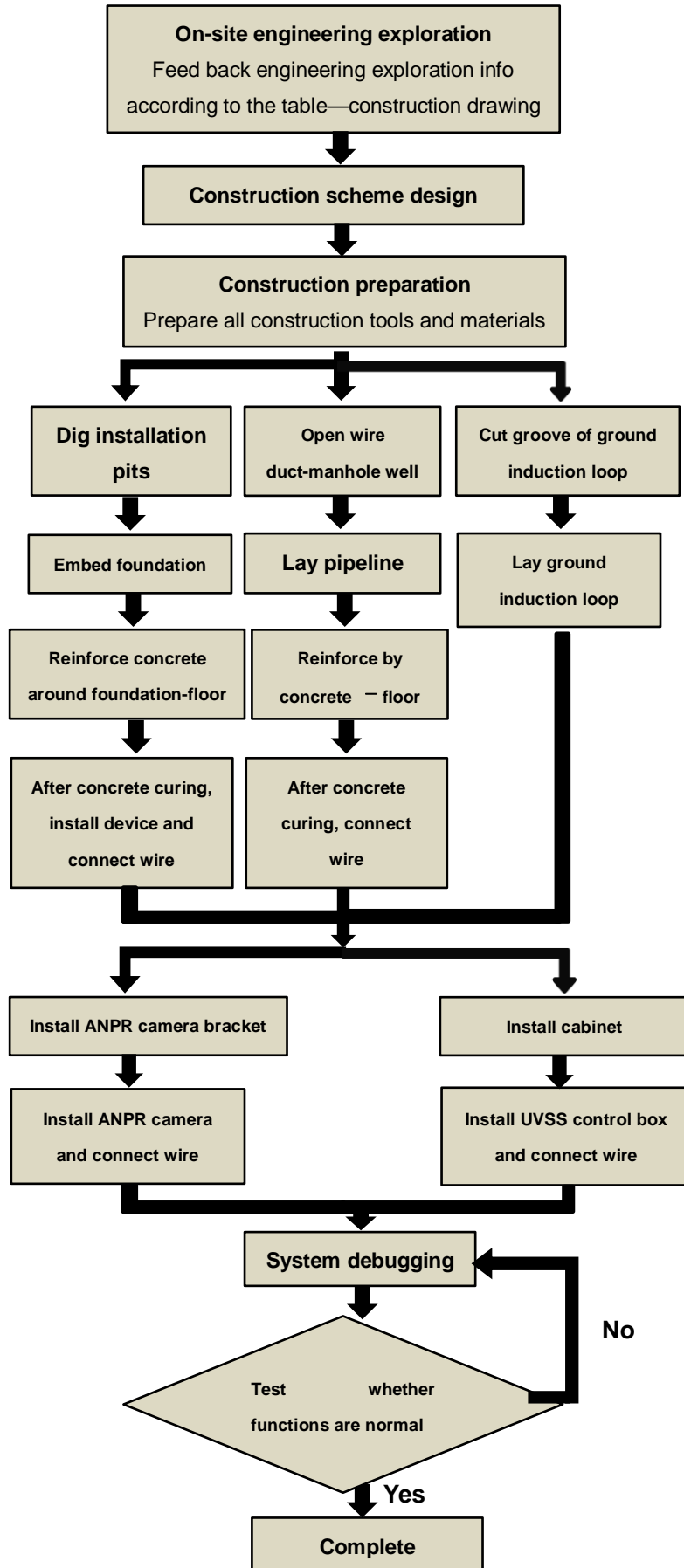
4. Guide line and parking line

Before coming into use, designate guide lines and parking lines of vehicles by considering owners' opinions comprehensively. It is suggested that guide line of small vehicle lane is about 2.5M wide and guide line of passenger vehicle lane is about 3.5M wide. Before entering UVSS system, the parking line shall be over 1.5M away from outside rim of previous ground induction loop.

V Construction Process

Construction position shall conform to the position designated by drawings. Specific installation processes are as follows:

1. Draw lines and dig pits according to drawings;
2. Embed UVSS foundation, galvanized conduits and drain pipes;
3. Fill concrete; vibrate and tamp it with electric rammer/ punner;
4. Install UVSS main component, arrange and connect wires;
5. Power on, debug snapshot scene of ANPR camera, set parameters of UVSS main component and carry out joint debugging of the whole device;
6. Carry out sealant application to seams between UVSS main component and installation foundation;
7. After coming into use, draw guide lines and parking lines on the ground by considering owners' opinions comprehensively.

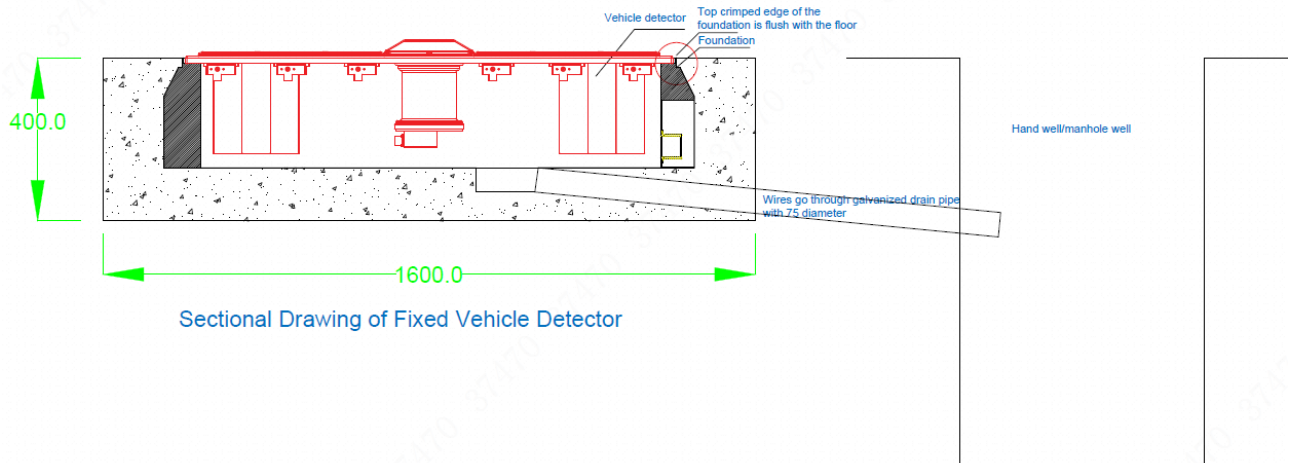


Note:

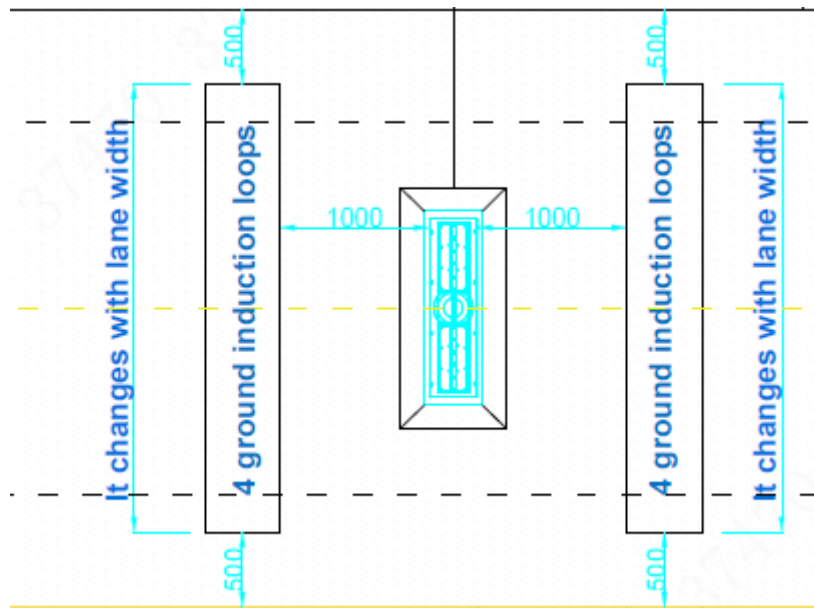
- During installation of the foundation, protect its threaded holes; prevent cement and other foreign matters from entering the threaded holes during construction, in order to ensure fixation of main component in the future.
- During installation of main component, please protect glass dome cover over it; prevent cement and other foreign matters from adhering to the surface of glass cover during construction, in order not to affect device imaging.
- After embedding of galvanized steel pipes, decide the sequence of filling concrete and wiring depending on construction situation.
- After UVSS main component has completed installation and debugging, carry out sealant application to seams between main component and foundation.
- For pit dimension of UVSS main component, please refer to the following planar graph.



Ground Hole Dimension Drawing



Sectional Drawing of Fixed Vehicle Detector



Hole Dimension Drawing of Ground Induction Loop

Note:

1. Embed ground induction loop and outdoor cabinet:

- Loop size: determine loop width according to lane width. Both sides shall be 500mm away from lane edges; four corners need 45° angles and chamfering length is 10-15cm.
- Grooving shall be 4-6mm wide and 40-60mm deep.
- During wire wrapping, reserve a tap to hand well on safety island and reserve certain redundancy in hand well.
- Before inserting wire, please clear the grooving and ensure that there are no sundries in the grooving. If water is used to clear the grooving, blow it, carry out air drying and start to insert wire only after the grooving is completely dry.
- Wires shall be clockwise wrapped into 4 bundles. During wrapping, blunt objects shall be used to compact wires one by

one.

- Cable from the loop to manhole/hand well shall lead two wires that shall be twisted pair. **Their density shall be at least 20 twists/meter.**
- If twisted pair lead is over 6m, use 2*1.5 m² shielded twisted pair.
- Ground induction loop shall be filled up with slurry.

2. UVSS main component- outdoor cabinet:

- Pit size: 1600*800*400
- After embedding foundation in the pit, concrete shall be placed and vibrated with a concrete vibrator, **and timber shall be used to support two sides of the foundation**, to prevent it from deformation. Top crimped edge of the foundation shall be flush with the pavement.
- 75MM galvanized steel pipe is embedded as conduits. Height of Embedding conduits at the main component end shall be over 100mm higher than manhole well end; top edge of pipe in the pit shall be over 300mm from the ground, so as to ensure complete drainage function.
- Inside a 75MM galvanized pipe, there is one 14-core custom-made communication cable, together with one 3*0.5 mm²/six-in-one power supply & light control line.

- During installation of main component, protect glass dome cover over the main body.

3. ANPR camera-outdoor cabinet:

- 32MM galvanized pipe is embedded. Inside the galvanized pipe, there is one $3*1.5 \text{ mm}^2$ power line, one CAT6 network line and one 2-core $2*0.5 \text{ mm}^2$ cable.

4. Outdoor cabinet and industrial computer of central control room:

- Embed one $3*1.5 \text{ mm}^2$ power line and two CAT6 shielded network lines (one of which is standby line).

5. Industrial computer of central control room and cabinet in machine room (go to video wall):

- Embed one CAT5e network line.

VI Appendix 1 Bill of Materials

No.	Material Name	Specification	Qty.	Note
1	UVSS main component	1195*322*278	1	Panel and above is 38MM thick
2	Foundation	1300*390*270	1	
3	Outdoor cabinet	850*600*220	1	
4	Control box (including green socket)		1	Eleven 2-pin socket and two 6-pin socket
5	ANPR camera		1	Depending on snapshot ANPR system qty.
6	8018 bracket		1	Depending on snapshot ANPR system qty.
7	ANPR camera pole	1.2M high	1	Depending on snapshot ANPR system qty.
8	Industrial personal computer		1	
9	Display	20.5-inch	1	
10	Keyboard		1	
11	Mouse		1	
12	Camera module cable	14*0.5	1	10M long
13	LED module cable	0.5 6-in-1 cab	1	10M long
14	Ground induction loop	FVN 1.5	2	65M coil
15				

Note:

1. The above table is a standard BOM of single-lane unilateral scanning. On-site personnel shall check according to BOM.
2. Due to on-site construction needs, on-site construction personnel shall prepare the following materials by yourself:
 - Several meters of 75MM galvanized steel pipe and PVC pipe (depending on the wiring distance between main device installation position and outdoor cabinet).
 - Several meters of 32MM galvanized steel pipe or PVC pipe (depending on the wiring distance between ANPR camera position and outdoor cabinet).
 - According to on-site actual conditions, prepare several meters of 3*1.5MM² power cable (depending on the wiring distance between on-site distribution cabinet and outdoor cabinet, between ANPR camera position and outdoor cabinet).
 - According to on-site actual conditions, prepare several meters of CAT6 shielded network cable (depending on the wiring distance between on-site industrial computer and outdoor cabinet), as well as several CAT6 shielded network cable connectors.
 - According to on-site actual conditions, prepare several meters of CAT5e network cable

(depending on the wiring distance between on-site industrial computer and display video wall or network cabinet, between ANPR camera position and outdoor cabinet).

- Several meters of $2 \times 0.5\text{MM}^2$ cable (depending on the wiring distance between ANPR camera position and outdoor cabinet).
- One coil of high-pressure waterproof tape and insulation tape respectively (for every set of device).
- One set of glass cement and application tool (for every set of device).
- Two wooden sticks, each of which is 200MM long (to support during embedment of the foundation).

VII Appendix 2 Construction Photos for Reference

Some construction photos are as follows:

Embedding of foundation:



Embedding of hand well/manhole well:



After both ends of LED aviation plug are tightened, wrap and protect them with high-pressure waterproof tape and insulated tape.



After foundation concrete has solidified, install main device:



During the entire construction, protect glass dome cover of main component of vehicle detector.



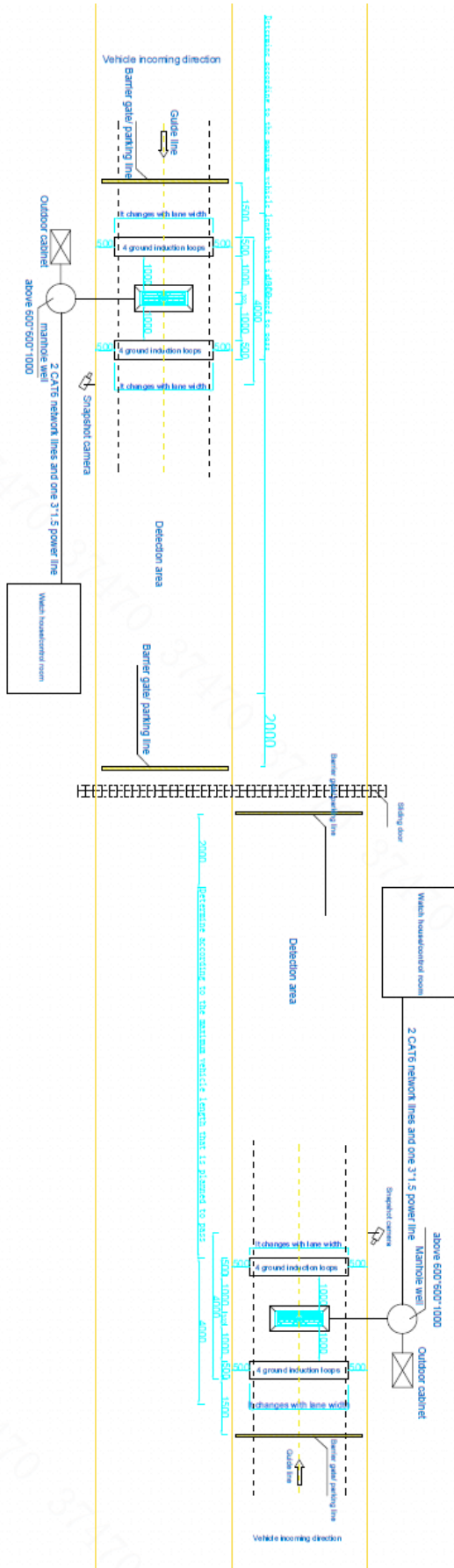
After the installation has been completed



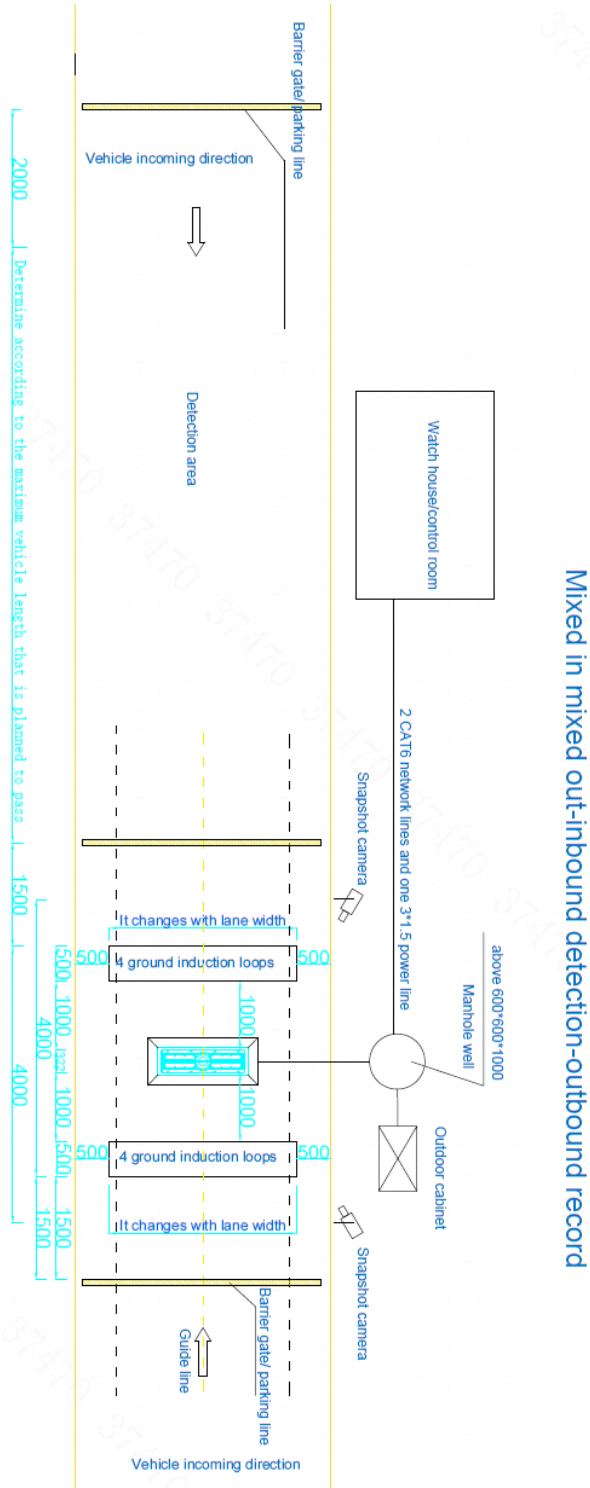
VIII Appendix 3 General Proposals for Reference

This is a unilateral lane. Complete vehicle chassis scanning before parking inspection. The proposal is as follows:

Single in single out-unilateral detection

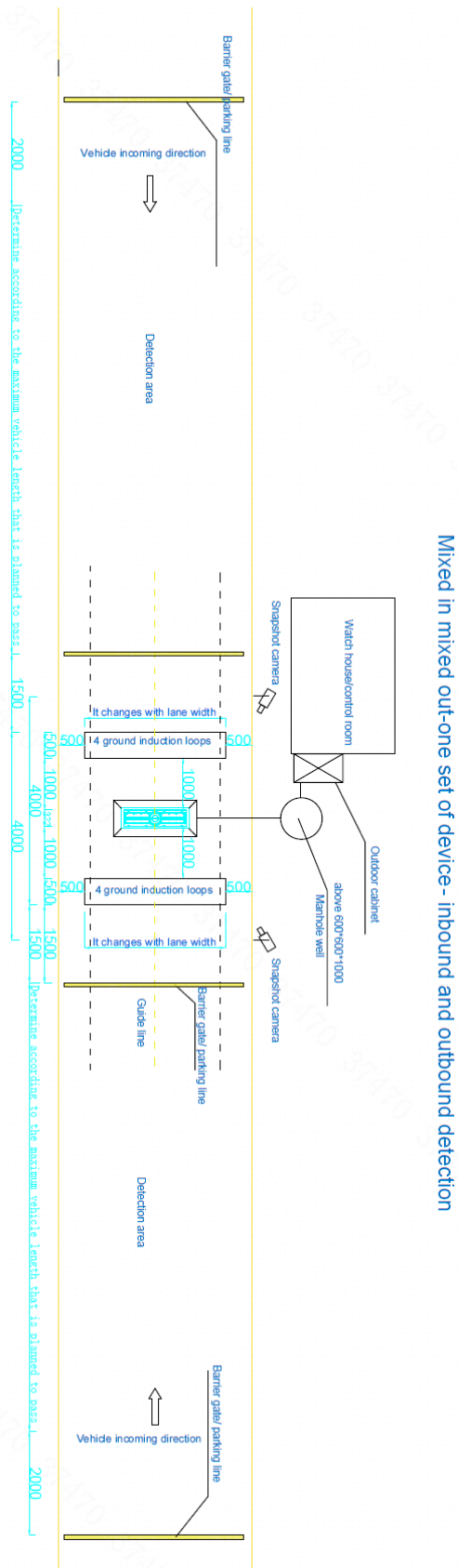


In case of mixed in mixed out, complete chassis imaging during inbound and record vehicle information during outbound. The proposal is as follows:



In case of mixed in mixed out and one set of device, complete chassis

imaging during inbound/outbound. The proposal is as follows:



In case of mixed in mixed out and two sets of device, complete chassis

