ITSSENSOR
PIEZO

WimRadar

ITSSENSOR **PIEZO**

ITSSENSOR PIEZO

Product **Manual**

Precision in speed control that **transforms enforcement**

GRUPO PUMATRONIX

UMA EMPRESA DO GRUPO PUMATRONIX

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Pumatronix Equipamentos Eletrônicos Ltda.

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Change History

Date	Revision	Updated content
12/12/2024	0.0	Previous Version
03/07/2025	1.0.0	Initial Edition
09/04/2025	1.1.0	WimRadar identity update (SAD-904)
09/23/2025	1.2.0	Addition of Local Asphalt Inspection (SAD-928)

General View

The piezoelectric traffic sensor is an advanced sensor that takes advantage of the piezoelectric effect to generate electrical signals by detecting pressure changes from vehicles. When inserted into a weighing solution it allows accurate monitoring of shaftshaft count, vehicle speed, classification and dynamic weighing. With features such as high sensitivity and durability, excellent cost-benefit and easy installation, it is a sensor widely used in highways and urban traffic management, providing critical data support for intelligent transportation systems.

The ITSSENSOR PIEZO sensor can be used to compose complete weighing scale system applications. The main features of the sensor are:

1) High dynamic performance: accurately detects single-axis data and separates continuous loads, ideal for high-speed weighing and monitoring;
2) High accuracy and sensitivity: responds to vertical forces, effectively isolating interference for accurate measurement;
3) Strong durability: fully sealed design, robust structure and long service life, withstanding 40–100 million shaft loads;
4) Excellent environmental adaptability: waterproof, moisture-proof, corrosion-resistant, and stable in extreme weather conditions without maintenance;
5) Easy installation with minimal road damage: small slot size (20×25mm) integrates seamlessly with the road, causing minimal disruption;
6) Durability: long service life and low maintenance make it an efficient and economical solution.
7) Versatile applications: Supports WIM, vehicle classification, speed monitoring, data collection, red light and toll enforcement;
8) Adaptable to various road conditions: Suitable for concrete and asphalt roads, with customizable sensor and cable lengths for full and wide lanes;
9) Low maintenance: Adapts to road deformation, with a sealed structure that significantly reduces maintenance costs.

It is a sensor used worldwide, with high reliability!

The weigh-in-motion ITSSENSOR PIEZO is a state-of-the-art device that supports vehicle weighing and classification inspection operations.

Figure 1 – ITSSENSOR PIEZO

It has two models for the following applications:

- Class I: Dynamic weighing, with output consistency of ±7%, suitable for applications requiring high-precision weight data;
- Class II (Classification): Used for vehicle counting, classification and speed detection, with an output consistency of ±20%. It is more economical and suitable for high traffic management applications.

Weighing sensors, when included in a complete solution, can provide the following statistical information:

- Counting and classification of vehicles;
- Total gross weight;
- Wheelbase;
- Weight per shaft;
- Weight per shaft set;
- Speed;
- Wheelset type classification (single or dual).

Pumatronix is a supplier of weighing sensors, LPR plate reading devices and illuminators to form a complete vehicle weighing solution!

Handling Risks

⚠	**Storage and Transport:** **Fragile: Keep the ITSSENSOR PIEZO in the original box. Do not put weight on top. Maximum stacking of Sensor boxes: 10.**
⚠	**Humidity: Do not leave exposed in a humid environment.**
⚠	**Impact: Do not hit or throw the ITSSENSOR PIEZO.**
⚠	**Handling: It must be done using a plastic glove.** **Do not bend the area of the PIEZO ITSSENSOR.**
⚠	**Closing the cut in the asphalt: When elastomer or tar is applied, when hot, touching the cable can damage it. Always use additional cable protection before closing the cut in the asphalt.**
⚠	**When preparing the Piezo Sensor, it is forbidden to bend the sensor at sharp angles. The required bends at the ends of the Piezo Sensor must comply with the angles and instructions specified in the product Installation Guide.**

Models

The models available are:

- Class I: Dynamic weighing

Class I – Weighing in Motion	Sensor Measurement	Cable length
ITSSENSOR PIEZO ELECTRIC CLASS I 1.5M	1.5 m	40 meters
ITSSENSOR PIEZO ELECTRIC CLASS I 2.0M (6'7")	2.0 m (6'7")	
ITSSENSOR PIEZO ELECTRIC CLASS I 2.5M (8'3")	2.5 m (8'3")	
ITSSENSOR PIEZO ELECTRIC CLASS I 3.33M (11")	3.33 m (11")	
ITSSENSOR PIEZO ELECTRIC CLASS I 3.5M (11.6")	3.5 m (11.6")	
ITSSENSOR PIEZO ELECTRIC CLASS I 5.5 M	5.5 m	

Notes: Customizations to the cable length and sensor size can be made, as long as pre-approved by the Pumatronix sales team, depending on the size of the project.

- Class II: Used for counting, classifying and detecting vehicle speed

Class II - Classification:	Sensor Measurement	Cable length
ITSSENSOR PIEZO ELECTRIC CLASS II 1.5M	1.5 m	40 meters
ITSSENSOR PIEZO ELECTRIC CLASS II 2.0M (6'7")	2.0 m (6'7")	
ITSSENSOR PIEZO ELECTRIC CLASS II 2.5M (8'3")	2,5m (8'3")	
ITSSENSOR PIEZO ELECTRIC CLASS II 3.33M (11")	3.33 m (11")	
ITSSENSOR PIEZO ELECTRIC CLASS II 3.5M (11.6")	3.5 m (11.6")	
ITSSENSOR PIEZO ELECTRIC CLASS II 5.5 M	5.5 m	

Notes: Customizations to the cable length and sensor size can be made, as long as pre-approved by the Pumatronix sales team, depending on the size of the project.

Summary

1. Getting to Know the Product

Smart Traffic Sensors are designed for permanent installation in the pavement or road surface to collect traffic data. The unique construction of the ITSSENSOR PIEZO allows it to be mounted directly on the road surface in a flexible manner.

Get accurate and specific speed data, trigger timing and traffic statistics. It is highly reliable, easy to install, cost-effective.

Mainly used for counting and classifying vehicles, measuring total gross weight, detecting vehicle length, wheelbase, weight per shaft and weight per set of shafts.

1.1. Operation

The ITSSENSOR PIEZO has been developed and designed for permanent installations on the road surface for collecting traffic data. The construction of the sensors allows direct installation on the track in a flexible format so that they can be adjusted to the needs of the track.

The flat construction of the ITSSENSOR PIEZO allows low noise due to flexure of the road, adjacent lanes and waves from approaching vehicles.

The installation of the ITSSENSOR PIEZO on the road is done with a small cut, which minimizes damage to the asphalt, thus reducing the installation time and the amount of materials used in the process.

It is available both as a Class I PIEZO ITSSENSOR, which has a better cost-benefit ratio for applications in statistical scales and selective weighing, or as a Class II PIEZO ITSSENSOR, which has a more effective cost-benefit ratio for Counting, Classification, Toll Fare Collection of the AVI type (automatic), Speed Detection and Red Light Advance.

The PIEZO ITSSENSOR acts when there is a variation in the pressure applied to it caused by a shaft or set of shafts when they pass over it.

The typical PIEZO ITSSENSOR consists of at least one piezoelectric sensor placed transversely on the track.

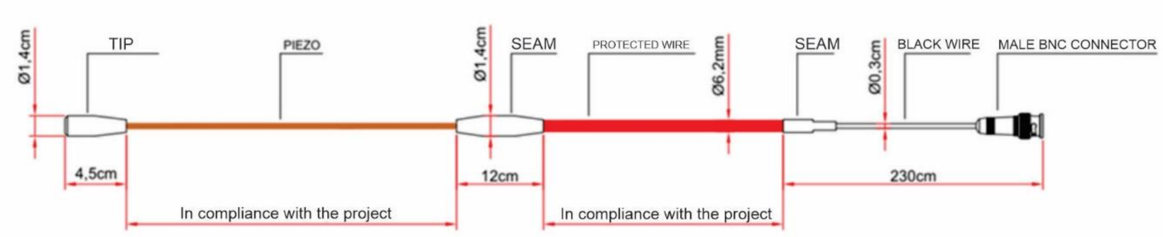

Figure 2 - ITSSENSOR PIEZO Traffic Sensor

1.2. Composition

The PIEZO ITSSENSOR consists of the following items:

1) ITSSENSOR PIEZO: Part containing the Sensor and connections to the Processing Cabinet. The Sensor measurement is variable and can be 1.5m, 2m, 2.5m, 3.0m, 3.3m, 3.5m and 5.5 meters. All sensor sizes come with a 40 meter cable.

Figure 3

2) Brackets: Device for fixing the ITSSENSOR PIEZO in the pavement cuts.

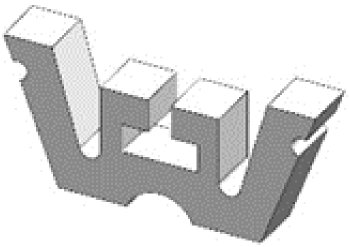

Figure 4

3) Application Tool: Aid tool for placing the ITSSENSOR PIEZO in the floor slots.

In addition to the sensor, brackets and installation tool, it is necessary to apply *Resin Cement* to the pavement during installation to seal the Piezo sensor. To obtain *Resin Cement*, Resin and a Catalyst are mixed, which can be purchased from an accredited supplier (Consult the Pumatronix/PMTX sales department for more information):

- TECHWIM PZ CATALYST
- TECHWIM PZ RESIN

2. Additional Documentation

Product	Link	Description
ITSSENSOR PIEZO	Maintenance and Installation Guide	Guide containing the information needed to install and maintain the ITSSENSOR PIEZO

3. Mechanical Specifications

- Sensor dimension: 1.6mmX6.3mm, ±1.5%, variable length, according to the project;
- Piezoelectric Material: Spiral wound PVDF piezoelectric film;
- Outer sheath: Brass 0.4mm thick;
- Central core: 16 gauge, silver plated, flat, stranded copper wire;
- Operating Temperature: -40º~85ºC;
- Temperature sensitivity: 0.2%/°C;
- Cable and Connector: RG58 cable shielded directly into the ground;
- Package: 540×540×145mm with two or four sensors per box;
- Bracket Dimensions: Installed with mounting bracket every 15cm. Material: Nylon, cannot be reused;
- Installation Cut Dimensions: 20mm×25mm (+-3mm). The cut length should be 100 to 200 mm longer than the total length of the sensor;
- Output Interface: Q9;
- Passive signal cable: RG58A/U, with high-density polyethylene sheath, can be directly buried; outer diameter 4mm, nominal capacity 132pF/m;
- Product life: >40 to 100 million times per axis.

When preparing the Piezo Sensor, it is forbidden to bend the sensor at sharp angles. The required bends at the ends of the Piezo Sensor must comply with the angles and instructions specified in the product Installation Guide.

4. Electrical Specifications

- Output Voltage: It depends on the sensor length and the applied mass
- Piezoelectric coefficient: 22 pC/N
- Typical output level: At 25°C, using a 250mm*6.3mm rubber head, pressing a force of 500KG, peak output 11-13V
- Output Uniformity ≥ 20pC/N Standard (According to Test Certificate) ±20% for Class II (Classification) ±7% for Class I (Weigh-in-Motion)
- Capacitance: 3.3m, 40m cable, 18.5nF
- Insulation resistance: DC 500V >2,000MΩ

5. Initial Setup

5.1. Installation Prerequisites

The conditions at the monitoring site, prior to installation, are essential for the operation of the equipment.

5.1.1 Pavement Inspection

The installation of Piezoelectric sensors requires inspection of the pavement on which it can be installed, specifically flexible pavement (CBUQ asphalt).

Pavements are structures that do not last forever and will present defects at some point. These defects, in turn, may be related to the end of the project's useful life (ideal situation) or be related to several other external factors, such as errors in execution or mixing. Therefore, identifying these defects and knowing their causes is extremely important for the paving area, both to avoid future errors and also to know the necessary measures and interventions when Piezoelectric sensors are installed.

5.1.1.1. Pavement Inspection Specifications

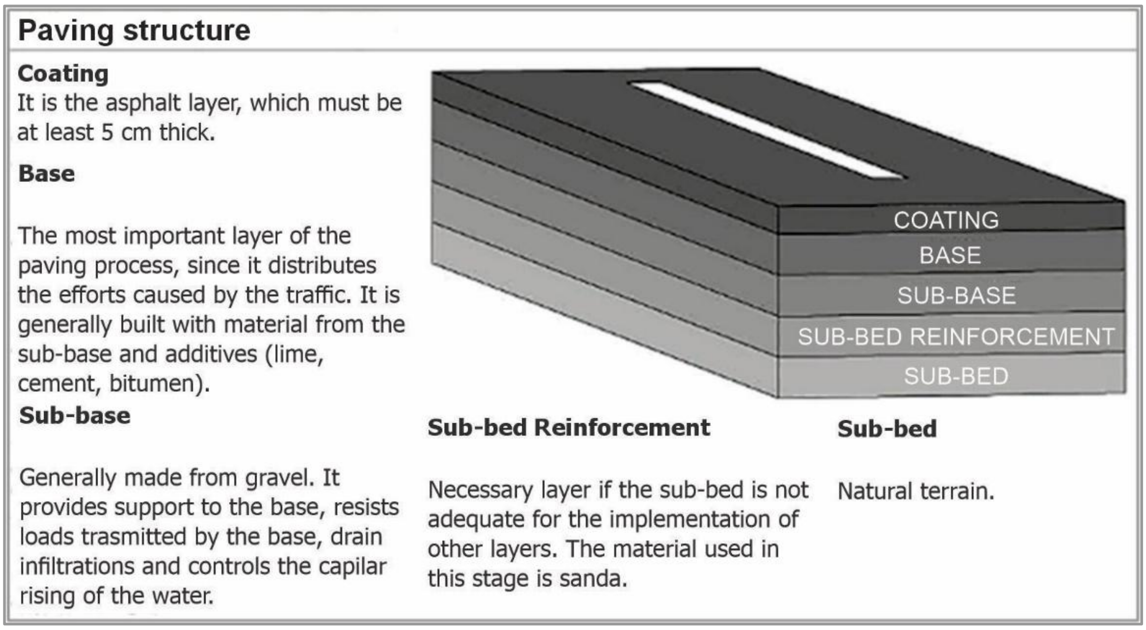

Figure 5

5.1.1.2. Local Asphalt Inspection

Carry out the inspection of the asphalt over a stretch of 80 to 100 meters from the location. It is important to follow a detailed procedure to ensure that the site conditions are adequate, without interferences that may compromise the system's accuracy.

1) Visual Evaluation of the Asphalt:

Assess whether the asphalt is in good overall condition or shows significant wear.

- Check whether there are cracks in the pavement.

Figure 6

- Observe the presence of undulations, potholes, or recent patches.

Figure 7

- Identify whether the stretch has been resurfaced or still has the original pavement.
- Evaluate whether the asphalt is smooth or rough.

Figure 8

- Confirm that the pavement is not excessively raised.
- Evaluate whether the stretch has an upward or downward slope.
- Observe the proximity of curves, verifying whether there is a minimum straight stretch of 300 meters before and after the installation location.

2) Traffic Flow Conditions:

- Check for nearby vehicle entrances or exits, such as access to streets, commercial establishments, residences, churches, hospitals, schools, or other points of interest.
- Observe whether there are speed bumps or any other element that may reduce vehicle speed. If present, they must be at least 300 meters away in both directions, approaching and moving away.

5.1.1.3. Main Defects of Flexible Pavement (CBUQ Asphalt)

- Fatigue Cracks and Permanent Deformation in the Wheel Track

The area subjected to repeated traffic action forms, over time, two of the main defects in flexible pavements, which are Fatigue Cracking in the Pavement, also called alligator cracking, and Permanent Deformation in the Wheel Track (Rutting).

Fatigue cracks are interconnected cracks forming small blocks, often called "alligator cracking". These fatigue cracks, which should not be confused with Block Cracking, are caused by structural problems, such as undersizing of layers, structural weakening of the pavement during rainy periods, or even repeated traffic action during the design period.

Permanent deformations in the wheel track are deflections caused in the tire tread area. It can be caused by undersizing of the pavement layers, errors in the dosage of the asphalt mixture, lack of compaction with subsequent consolidation by traffic, or by shear caused by weakening. Figure 8 illustrates fatigue cracks and permanent deformation in the wheel track, clearly showing the area where the tires pass through.

Figure 9 - Permanent Deformation (Rutting) and Fatigue Cracking in the wheel track.

Source: Author (2018)

- Block Cracks

The big visual difference between block cracks and fatigue cracks is most often the block size and patterns. Block Cracks are generally larger and have a shape very close to a rectangle, unlike what occurs with fatigue cracks. Furthermore, these cracks are not related to fatigue and are often caused by changes in the viscosity of the coating layer or contraction and expansion of other pavement layers due to temperature variations throughout the day.

Cracks can also appear due to the use of a high percentage of fine aggregates and a Petroleum Asphalt Cement (PAC) with a lower penetration value, i.e., higher viscosity. Furthermore, the low volume of traffic in the first years of the pavement, during the consolidation phase, can accelerate the pavement aging process. The severity of these cracks is related to the size of the opening, and the presence of erosion in the corners. Cracks must be sealed or treated to prevent water from entering and subsequently causing other defects to appear. Figure 9 illustrates the defect.

Figure 10 - Block cracking. Source: Author (2018)

- Longitudinal Cracks

In addition to problems caused by traffic, pavements may present defects related to changes in temperature or poor execution. Longitudinal Cracks are cracks parallel to the axis of the road and can appear both in the wheel tracks and in other areas of the road. This defect is generally caused by poor execution of lane division joints.

Figure 10 illustrates Longitudinal Cracks. These defects are often confused with the beginning of a Fatigue Cracking, which presents the same pattern.

Figure 11 - Longitudinal Cracking. Source: Author (2017)

- *Potholes*

Another very common defect is Potholes. Potholes are holes due to the disintegration of parts of the coating and are caused by traffic or the presence of water. This type of defect begins with fatigue cracks and, over time, parts become detached from the pavement structure.

In addition to structural causes, potholes can have their origin in construction problems. Often in a rush for "results", not to mention a lack of ethics and supervision, some people carry out the coating without correctly applying the primer layer, or without waiting for it to cure. The absence of this procedure prevents adhesion between the layers, which in turn results in localized removal of the coating. The severity of the pots is measured based on the depth, which is greater than 5 centimeters and is considered high. Figure 11 illustrates a high severity pothole.

Figure 12 - Potholes. Source: Author (2018)

- *Raveling*

Bituminous materials contain organic compounds maltenes and asphaltenes. Maltenes constitute the oily part of the material, with plastic and viscosity properties. Asphaltene is the solid portion of the material and provides rigidity properties. As the material ages and climate changes, maltenes transform into asphaltenes. This change in bituminous materials also generates defects called Raveling.

Raveling is related to the loss of adhesiveness of the bituminous material, caused by aging, hardening, oxidation or due to weathering. In addition to problems associated with the aging of the material, wear may be related to the lack of asphalt binder in the mixture, loss of adhesiveness due to the action of external chemical products or even opening to traffic before the binder adheres to the aggregate. Although raveling is often associated with overuse, it can be the result of other actions, including applying coatings in unfavorable conditions. Figure 12 illustrates raveling in the pavement.

Figure 13 - Raveling. Source: Author (2018)

- Corrugations

One of the characteristics of a pavement is to resist the horizontal forces imposed by traffic. Corrugations in pavements are plastic deformations that form certain undulations on the surface. This defect is generally the result of tangential forces, that is, acceleration and braking forces that the tires exert on the asphalt pavement.

International asphalt pavement manuals differentiate this defect into two categories:

- When they have a short wavelength they are called "Corrugation".
- Longer wavelengths, or isolated lifts, are called "Shoving".

The reason for its appearance is linked to structural failures (very thin coating thicknesses), failures in the asphalt mixture dosage or even construction problems. In the case of thin layers, braking and acceleration movements can cause the layer to "slip" due to the low stability of the mixture, generating corrugations. Figure 13 exemplifies the defect in front of the CERET Park in Anália Franco in São Paulo, close to a traffic light.

Figure 14 - Shoving and Corrugation. Source: Author (2018)

- Patches

A patch is an area of pavement where the original material has been removed and replaced with new material. They are mainly used to correct potholes, which if not corrected can further compromise the structure. Although they are used for correction, patches are also considered defects in the pavement.

This occurs because the presence of a patched area indicates that some other defect has already occurred there. Therefore, they are considered as defects so that the area is not ignored and is always monitored to prevent the appearance of other defects. However, patches do not apply to all cases of pavement deterioration and must be analyzed on a case-by-case basis.

Figure 14, for example, indicates a patched area but with several cracks around it. In other words, as soon as the cracks propagate, it will deteriorate again.

Figure 15 - Patch. Source: Author (2018)

- Reflection Cracks

In the past, it was common to use cobblestones as the last layer of paving, and there are several parts of cities where these materials can still be found. However, overlapping these materials with an asphalt layer can cause defects.

Reflection Cracking is a crack that appears due to problems with the lower layer, such as base cracks that appear in the coating. These cracks are also linked to the rigidity of the layer where the asphalt coating is laid. In the case of parallelepipeds, which are highly rigid materials, their shape is reflected in the coating layer as cracks, as shown in Figure 15. These materials, because they have a smooth surface, do not adhere to the asphalt layer, and over time this ends up coming loose from the structure, Figure 16.

Figure 16 - Reflection Cracking. Source: Author (2018)

Figure 17 - Lack of adhesion on cobblestones. Source: Author (2018)

Crack Reflection, or simply crack propagation, is a phenomenon that occurs due to the full contact of an upper layer of asphalt mixture with a lower layer that has fissures on its surface.

When a cracked pavement in the lower layer is subjected to a load, a different state of stress occurs in the contact region. This means that the distribution of stresses does not occur uniformly across the pavement, generating a concentration at some points. Therefore, cracks tend to reflect at these points where the discontinuity in the distribution of forces occurs.

Crack reflections are one of the main reasons why we should not apply asphalt layers, or simply resurfacing, under layers that have not had their cracks sealed or milled. If this occurs, the probability of the new layer showing cracks in the first few months of use is extremely high.

- Transverse Cracks

Transverse Cracking occurs perpendicular to the axis of the track and is generally related to thermal contraction of the coating or the lower layer, and can also be caused by reflection. Figure 17 illustrates a transverse crack connecting to a longitudinal crack.

Figure 18 - Transverse Cracking. Source: Author (2018)

- Fines Pumping

The appearance of cracks, holes and other defects presented above reduce the usefulness of the pavements and generate higher road costs. Furthermore, if maintenance is not carried out, it can lead to other defects such as Water Bleeding and Pumping.

Pumping consists of the exit of materials through cracks or joints and can be divided into two categories. When water leaks out, international literature classifies this type of pumping as “Water Bleeding”. When the material expelled from the structure is water and fines from the lower layer, it is called Pumping.

Pumping occurs by applying mobile loads to the pavement, increasing pressure and causing material to escape through cracks. The presence of water stored in the lower layers is one of the reasons why these defects occur, also leading to a decrease in support capacity. Furthermore, the presence of fines or vegetation in cracked regions indicates the presence of water accumulation and pumping in the pavement. This defect may also be related to the lack of adequate drainage, Figure 16 indicates the occurrence, very common in urban areas.

Figure 19 - Pumping and Water Bleeding. Source: Author (2018)

- Bleeding and Polished Aggregates

Defects often occur due to non-compliance in execution or errors in projects, dosages, etc. Bleeding is the excess of asphalt binder on the surface of a flexible pavement, which becomes easily identifiable by the reflection it causes when exposed to light.

This defect is caused by a set of errors. They often occur due to errors in the dosage of the asphalt mixture, such as using a high level of binder. It can also be caused by excessive priming at the time of execution, or by a lack of voids in the asphalt mixture dosage.

Polished Aggregate is the wear of the aggregates and pavement binder. The defect is caused by abrasion from traffic or improper selection of aggregates.

Both defects not only cause problems with the "appearance" of the pavement, but the excess/lack of binder and the polishing of the aggregates also influence the macrotexture of the pavements. With the macrotexture affected, the coefficient of friction decreases and can lead to accidents due to aquaplaning, mainly. Figure 19 illustrates bleeding.

Figure 20 - Bleeding. Source: Author (2018)

- Edge Cracking and Differences in Level between the Track and the Roadside

In Pavements that do not have roadsides or lack lateral confinement, crack defects occur at the edges. Edge Cracking occurs due to insufficient compaction of the mix, poor drainage in the pavement or, as mentioned, lack of lateral confinement and these cracks generally have a parabolic appearance.

Figure 20 illustrates an edge cracking connecting to other cracks (transverse and longitudinal), and with the presence of vegetation, most likely due to poor drainage.

Figure 21 - Edge Cracking. Source: Author (2018)

- Deformations or Ripples in Asphalt

On pavements that do not have a good base or where vehicles with excess weight circulate, ripples appear, displacing the CBU asphalt to the intermediate regions where the wheels of trucks and vehicles pass.

Figure 22

Figure 23 - Deformations or ripples caused by the passage of very heavy vehicles and/or poor quality of the applied base

- Examples of Bad Asphalt

Figure 24

Figure 25

Figure 26

Figure 27

Figure 28

Figure 29

Figure 30

Figure 31

- Examples of Good Asphalts

Figure 32

Figure 33

Figure 34

Figure 35

Figure 36

5.2. Necessary Infrastructure

In addition to the Inspection of the Pavement on which the ITSSENSOR PIEZO will be installed, the processes below must be carried out, if possible, in the order presented, as detailed in the ITSSENSOR PIEZO Installation and Maintenance Guide:

1) Cut in the asphalt for the sensor;
2) Cut in the asphalt for cable passage;
3) Testing, preparation and installation of ITSSENSOR PIEZO;
4) Placement of the temperature sensor in the cut for cable passage (when applying the Class I model, used in Weighing);
5) Closing the cut in the asphalt for the ITSSENSOR PIEZO (using Resin Cement);
6) Closing the cut for cable passage in the asphalt (protecting the cables when using elastomer or hot tar).

Notes: It is the installer's responsibility to evaluate and assess the requirements for incorporating the Piezo sensor into their weighing solution.

Closing the cut in the asphalt: When elastomer or pitch is applied, when hot, touching the cable can damage it. Always use additional cable protection before closing the cut in the asphalt.

6. Care and Maintenance

Some care is necessary to ensure the product's performance and extend its useful life.

Product Risks: The use of the product presents risks, which are presented in the Handling Risks section.

7. General Warranty Conditions

Pumatronix warranties the product against any defect in material or manufacturing process for a period of 1 year from the date of issue of the invoice, provided that, at the discretion of its authorized technicians, a defect is found under normal conditions of use.

The replacement of defective parts and execution of services arising from this Warranty will only be carried out at Pumatronix Authorized Technical Assistance or a third party expressly named by Pumatronix, where the product must be delivered for repair.

This Warranty will only be valid if the product is accompanied by a *Maintenance Form* duly completed and without erasures and accompanied by the Invoice.

7.1. Situations in which the Product Loses its Warranty

1) Use of software/hardware not compatible with the specifications in the Manual;
2) Connecting the product to the electrical grid outside the standards established in the product manual and installations that present excessive voltage variation;
3) Infiltration of liquids from opening/closing the product;
4) Damage caused by natural agents (electrical discharge, flooding, sea spray, excessive exposure to climate variations, among other factors) or excessive exposure to heat (beyond the limits established in the Manual);
5) Use of the product in environments subject to corrosive gases, with excessive humidity and/or dust;
6) Show signs of tampering with security seals;
7) Show signs of opening and modification made by the Customer in areas of the product not authorized by Pumatronix;
8) Damage caused by accidents/falls/vandalism;
9) Display tampered and/or removed serial number;
10) Damage resulting from the transport and packaging of the product by the Customer in conditions incompatible with the same;
11) Misuse and in disagreement with the Instruction Manual.

8. Privacy Policy

In compliance with the General Data Protection Law (LGPD) - Law No. 13,709, of August 14, 2018, this product has programmable functions for capturing and processing images that may violate the LGPD when used, in conjunction with other equipment, to capture personal data.

The equipment does not collect, use or store personal information, whether sensitive or not, for its operation.

Pumatronix is not responsible for the purposes, use and processing of the captured images, and the control of the information and methods of operation of the product are the exclusive decision of the user or purchaser of the product.

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