TECHNICAL INFORMATION AND PHOTOS

NEW CONSTRUCTION TECHNOLIGIES

SEMI COUNTINUOUS CONCRETE

AND

CONCRETE SLAB FOUNDATION SYSTEM

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SOME WORKS DONE USING OUR TWO CURRENT TECHNOLOGIES AND DIFFERENT PARTS OF THE SAME WITH PHOTOS INCLUDED

Question - On which construction projects the current IS.COM technologies has already been implemented in and what the corresponding experiences are?

TECHNOLOGY – SEMI-CONTINUOUS CONCRETE

1.1 – Using Steel Load Transfer Plates without any joint inductor nor EPS

1.1.1 Without any base at all – construction directly over the top soil

Designation	Road at Valença (North board of Portugal)
Loads	Truck with 13.000 kg per axel
Dimensions	Slabs 8 x 4 m - thickness of de 16 cm
Length	12 km
Year of Construction	1989
Traffic Intensity	1989 – 1997 Middle High 1998 – 2012 Middle Low 2013 – 2020 Reduced
Conditions at the present time	At the end of **31 years** the pavement is quite good with any maintenance works at all. **To pay attention and be aware that the road is at least every two years flooded with water from the river Minho nearby and at such times it continues to be used whenever is possible.** . **Nevertheless the farmers have dug holes under the slabs to pass water pipes for irrigation thus breaking some slabs due to lack of support**

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Photos – Construction 1989

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Photos 1991 – Road in use

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[Photos 2016-2018]

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Crossing the concrete & piping water by the farmers – farmers responsibility

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NO BASE AT ALL WAS CONSTRUCTED – CONSTRUCTION OVER THE TOPSOIL

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Using Steel Load Transfer Plates without joint inductor and using a conventional base

Designation	Road at Vila Nova de Cerveira
Loads	Truck with 13.000 kg per axel
Dimensions	Slabs 8 x 4 m - thickness of de 16 cm
Length	7 km
Year of Construction	1993
Traffic Intensity	1993 – 2008 Intensive 2009 – 2014 Middle High 2015 2020 Middle Low
Conditions at the present time	At the end of 27 years –Quite good, no maintenance works

Designation	Lipor – Waste treatment plant
Loads	Truck with 13.000 kg per axel
Dimensions	Slabs 20 x 6 m - thickness of de 16 cm
Length	20.000 m2
Year of Construction	1994
Traffic Intensity	1994 – 2020 Middle High
Conditions at the present time	At the end of 26 years –Very good with no maintenance works whatsoever

Photos – Construction 1994

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Photos 2017

Designation	Inferior passage of A 28 in Oporto (Highway)
Loads	Truck with 13.000 kg per axel
Dimensions	Slabs 8 x 5 m - thickness of de 16 cm
Length	2 km
Year of Construction	1994
Traffic Intensity	1994 – 2020 Very Intensive
Conditions at the present time	At the end of 16 years –Very good, no maintenance works whatsoever

Photos 2018

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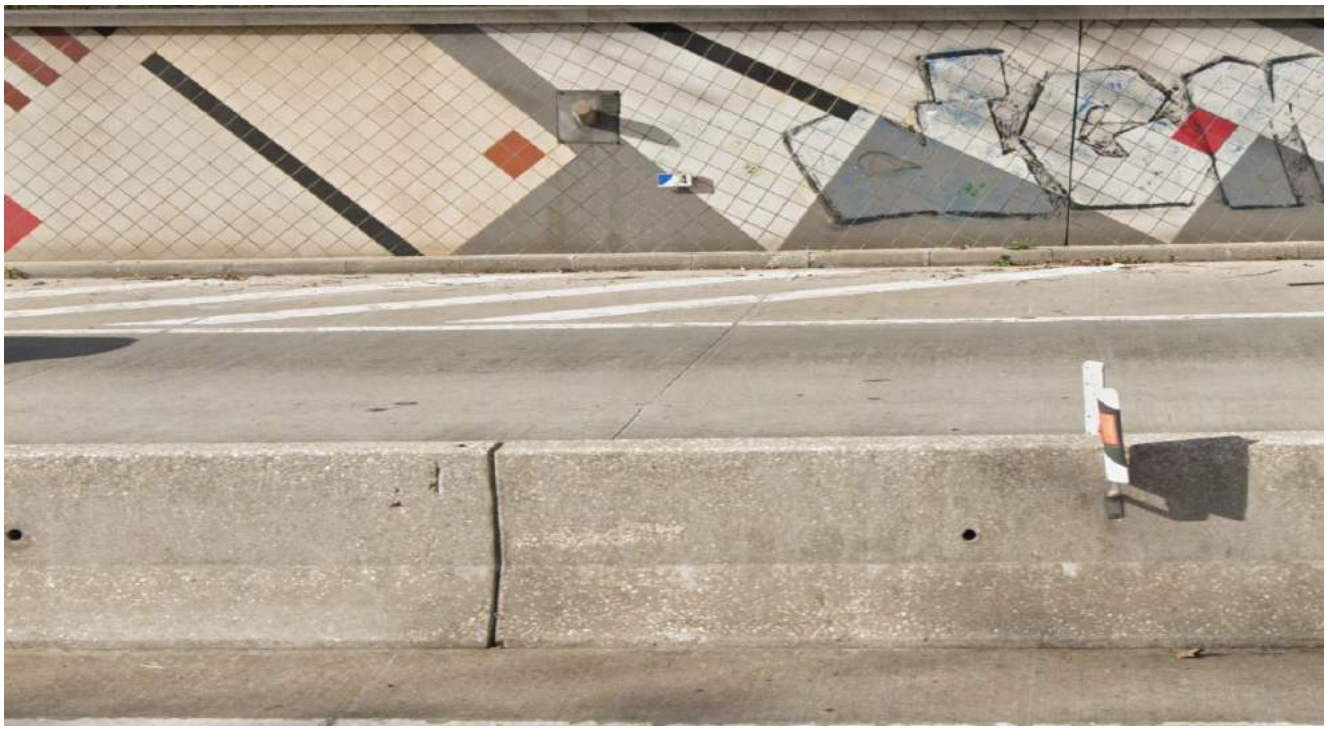

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Designation	Cimpor Road at Azores Islands– Cimpor Cement factory
Loads	Truck with 13.000 kg per axel
Dimensions	Slabs 8 x 4 m - thickness of de 16 cm
Length	5 Km
Year of Construction	1998
Traffic Intensity	1998 – 2020 Middle High
Conditions at the present time	At the end of 22 years – Very good with no maintenance works whatsoever **Kindly note that in Azores the island is subjected to several earthquakes – Cimpor is the major cement producer in Portugal.**

Photos – Construction 1998

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Photos 2018 - In Azores Islands earthquakes happen often sometimes more than once a year

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Designation	Alverca Warehouse - Unloading and parking place and warehouse
Loads	Truck with 13.000 kg per axel
Dimensions	Slabs 8 x 4 m - thickness of de 16 cm
Length	200.000 m2
Year of Construction	1990
Traffic Intensity	1990 – 2014 Intensive 2014 – 2020 Reduced
Conditions at the present time	At the end of 30 years • Excellent in the interior of the warehouse with any maintenance works • Reasonable in the exterior (parking lot for trucks). • **Notwithstanding the pavement have been subjected to several and cyclic floods of river Tejo and no maintenance works have been made - Constructed for SONAE a Portuguese major company that abandon/sold the premises in 2014**

Construction phase 1990

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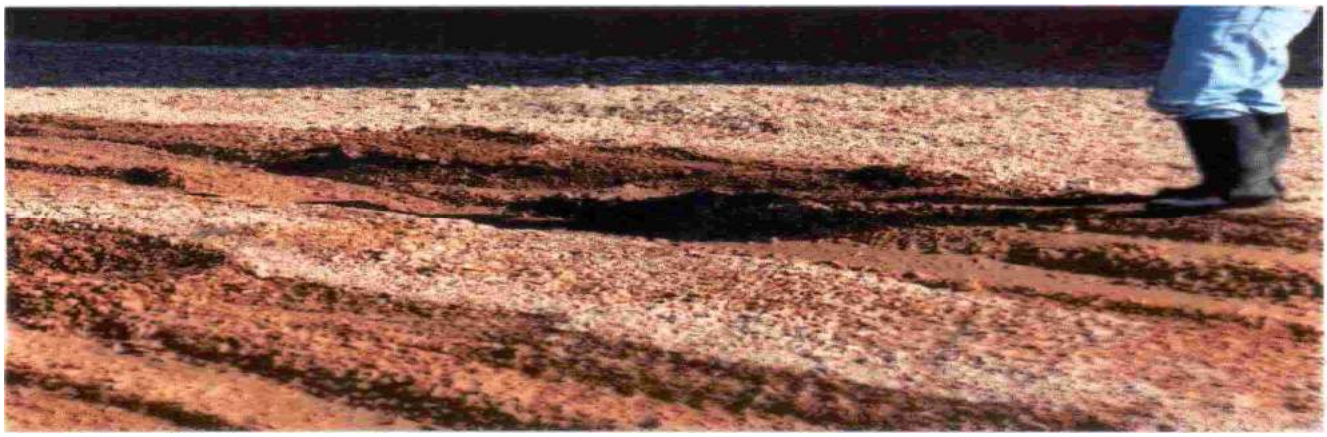

In use 1994

Warehouse Rear 1994

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[Photos 2018]

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[Warehouse interior floor 2018]

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1.1.2. Using Steel Load Transfer Plates and joint inductor with conventional base

Designation	Highway A8
Loads	Truck with 13.000 kg per axel
Dimensions	Slabs 5 x 6m - thickness of de 20 cm
Length	16 Km **(repair of a section of concrete construction that in the original construction was built using dowel bars)**
Year of Construction	2000
Traffic Intensity	2000 – 2020 Very Intensive
Conditions at the present time	At the end of 20 years • Good without any maintenance works –in 2018 it was covered with asphalt once Brisa is covering all sections made with concrete

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Construction 2000

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In use - photos 2017

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Designation	Maritime Port at Vitória (Brazil) / Pirelli Cables – (Hochtief as general contractor)
Loads	Punctual loads of 25.000 kg
Dimensions	Slabs 5x 5 m - thickness of de 25 cm
Length	8.000 m2
Year of Construction	2011
Traffic Intensity	2011 – 2020 Very intensive use
Conditions at the present time	At the end of 10 years • Very good, any maintenance works were carried out.

Photos - Construction 2011

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Recalque diferencial da fundação após 10 meses

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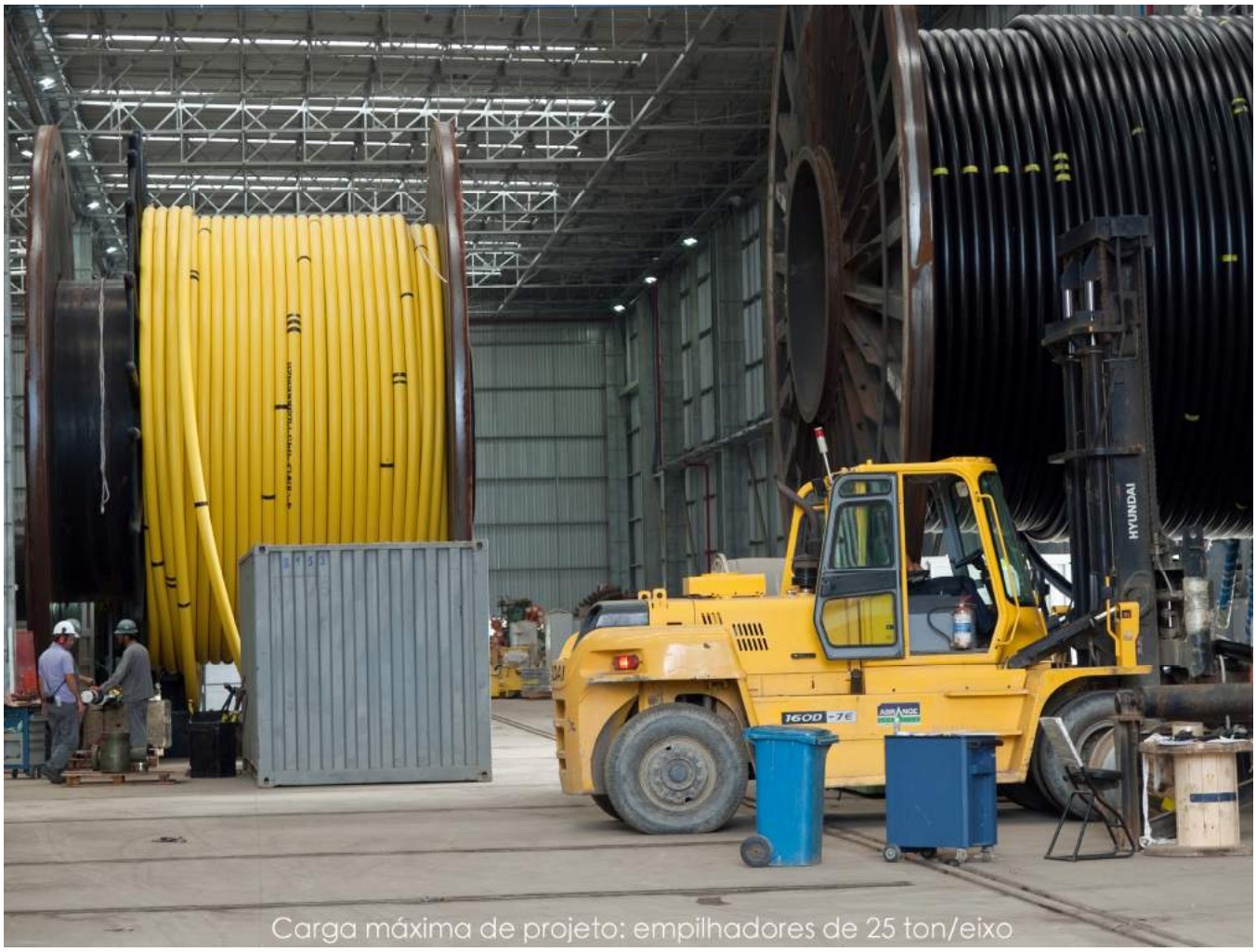
In use – Photos 2014



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In use – Photos 2014

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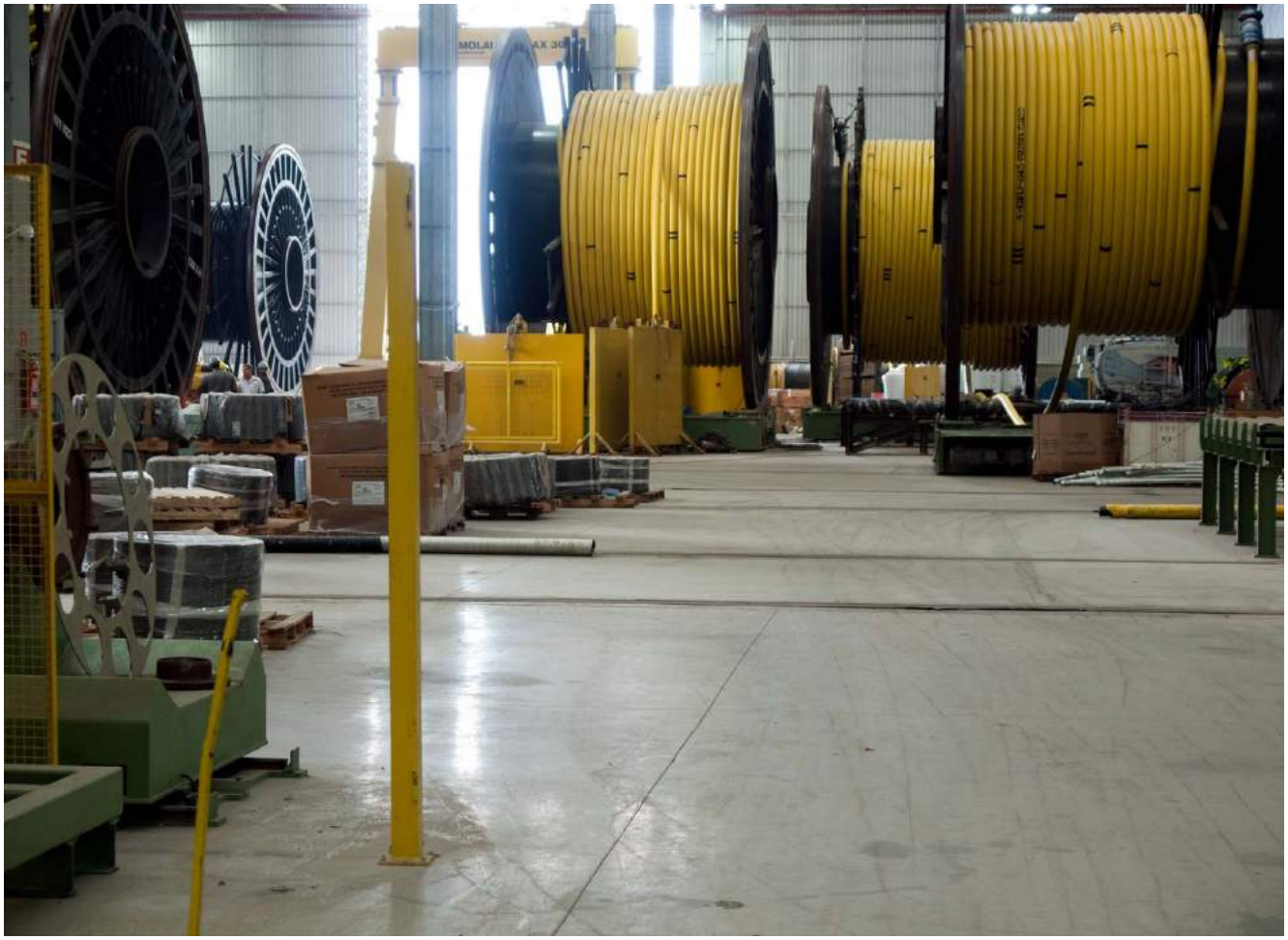

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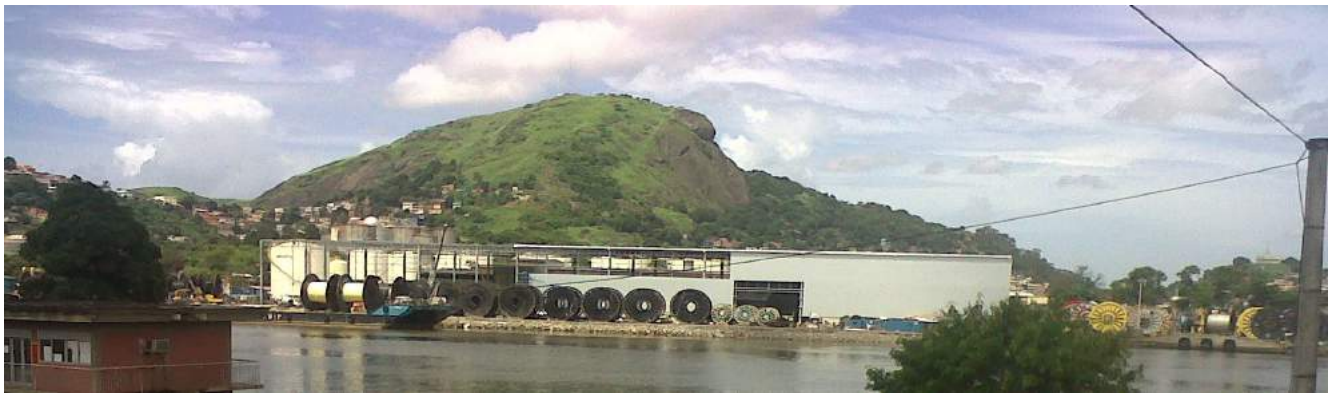
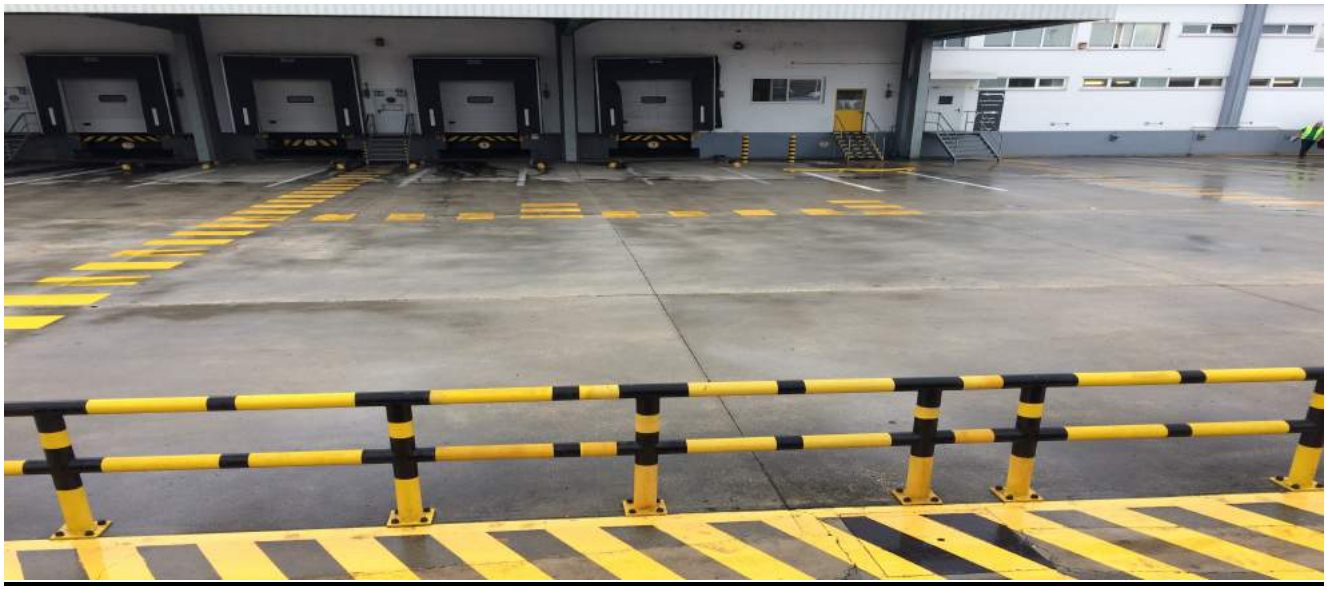


1.2. Some other works done

1.2.1. Nestlé at Avanca Portugal – 1993 - Photos 2019



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1.2.2. Factory Biancogres at Vitória Brazil 2013

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1.2.3. Warehouse at Vitória Brazil 2012

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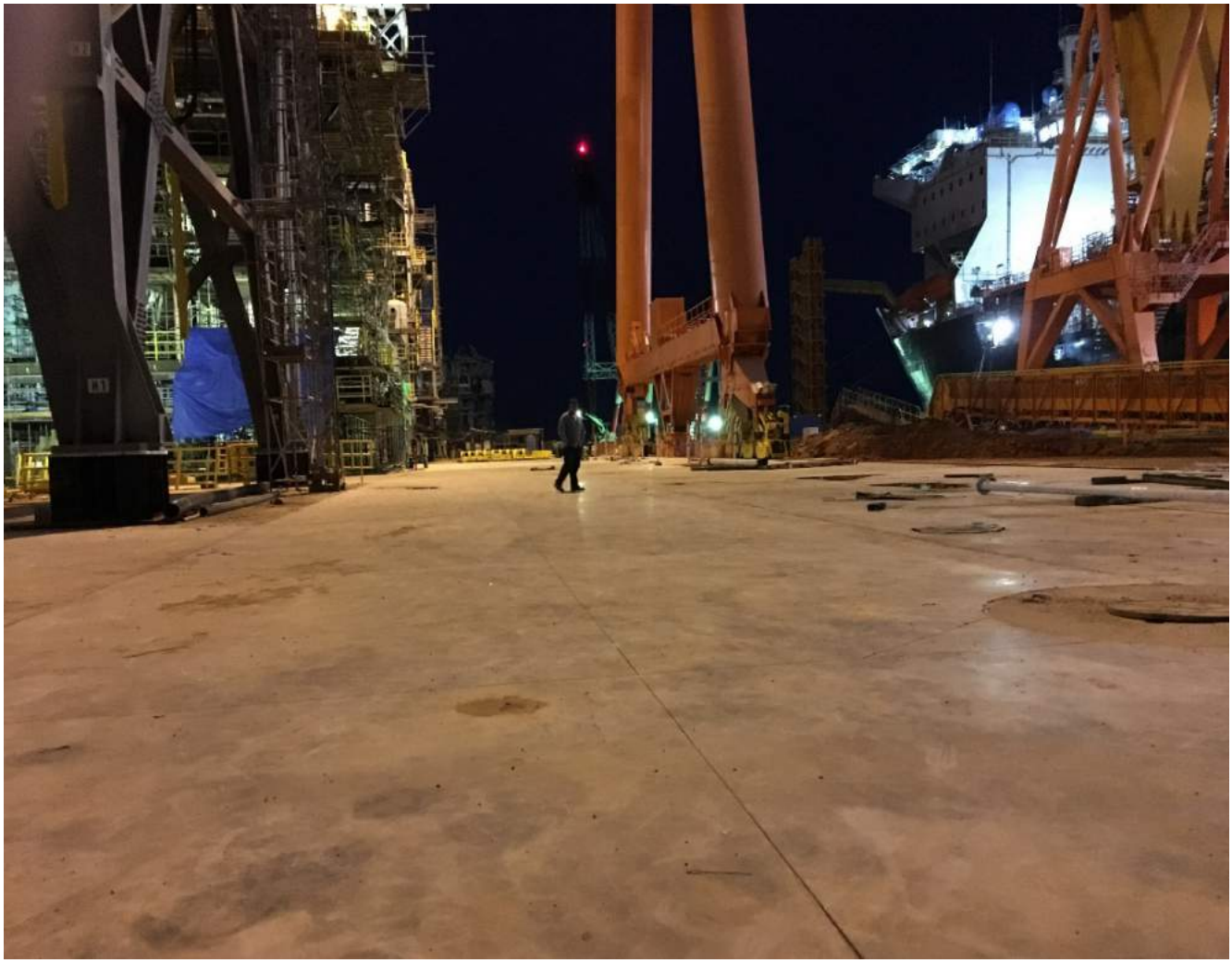
1.2.4. Jurong Port at Aracruz Brazil 2015



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TECHNOLOGY OF MONOLITHICALLY FOUNDATION

1.3. Using Steel Load Transfer Plates with joint inductor and EPS High Density (30 Kg) as a base

Designation	Factory Metalo-mecânica – Vitória (Brazil)
Loads	Truck with 13.000 kg per axel
Dimensions	Slabs 5 x 5 m - thickness of de 16 cm
Length	900 m2
Year of Construction	2011
Traffic Intensity	2011 – 2020 Very intensive
Conditions at the present time	At the end of 9 years • Very good, any maintenance works were carried out. • Trucks entering and leaving the premises loaded with steel. • Steel cutting machine exercising **impacts of 200 tones** without any vibration transmission at all into the contiguous slabs that support the steel cutting machines and bending machines for steel sheets.

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Our Steel Load Transfer Plates are unique and they make all the difference when constructing in concrete highways, roads, maritime ports, airports, factories, warehouses, refrigerated warehouses, parking lots, railways, etc.

These unique Steel Load Transfer Plates allow soil settlements of 3 cm without breaking the slabs and always ensuring the structural continuity of the pavement.
Dowel Bars allow only 2 mm (0.2 cm) of soil settlement. More than 0.2 cm of any soil settlement the slabs break when made with the Dowell bars.

Our unique Steel Load Transfer Plates also allow the slabs to slide on the base either vertically to the joint or horizontally without any stresses due to expansion / or shrinkage/or retraction.

Also our unique Joint Inductor allows the joint opening without any mechanical intervention at the exact location intended.
It also prevents all liquid infiltration into the and from the base, being watertight, and therefore joint sealing is completely unnecessary.

A conventional base with several layers may be used or we can substitute the entire base by using E.P.S (high density expanded polystyrene) or using any other inert materials or again using compacted sand wrapped in geotextil fabrics to prevent any displacement of such base.

All the concrete mix, for all the works carried out in Portugal, were made by the Professor Engineer Ana Maria Proença (Oporto Engineering Faculty) who always gives us the greatest guarantees of appropriate resistance of concrete required for our projects, as she is a world authority in materials resistance. An excellent composition of the concrete is completely indispensable to ensure the longest duration of the works.

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