TICOPTER SA
Road safety, project and patents

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Crash cushon redirective
TUBE-ZMP80®
Parallel level 80 km/h
UNI EN 1317:3-2010
Installation manual

Agno 22/07/2015
Rev. 1

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Summary

1. General informations

This document is the installation manual of the "redirective" crash cushion parallel , class 80 km/h, called TUBE ZMP80. All the steps and times have been designed in order to provide a proper assembly and operation of the crash cushion. Consequently, every change must be agreed and authorized by Ticopter s.a.

The time of tightening of the bolts must be checked, paying particular attention, in order to avoid assembling problems in the next phases. In detail, the device is made up of:

- 2 rails HEA 100
- 1 frontal rails link
- 1 head module (modul 0)
- 3 intermediate modules (modul 1-2-3)
- 1 back module

2. Installation conditions

The crash cushion TUBE ZMP80 has been realized on purpose for the protection of fixed structures, gore points and toll. The accessibility of the area must be checked in order to let the vehicle pile driver work and also the absence of obstacles both above and below the surface (trees, walls or pipelines, underground utilities etc.) need to be assured.

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The supply includes:

- 2 rails HEA100
- 4 bolts TE M16x40 8.8 with nut and two washers
- 1 frontal rails link
- 1 crash cushion (modules from 0 to 4)
- 6 poles C 120x80x30 5 mm l = 1500 mm
- 4 bolts M16x120 TE 8.8 with nut and two washers
- 2 bolts M16x160 TE 8.8 with nut and two washers
- 12 bolts M10x50 class 8.8 with nut

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3. Preparation.

The rails can be inserted in the lower part of the crash cushion, which is made up of the modules from 0 to 4 enclosed one inside the other. Then you can put the front connection between tracks and secure with 4 bolts M16x40 TE tightened to 40 Nm. At this point you have to draw the correct position that will be taken by the crash cushion and then place it using the centerline.

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4. Installation of the posts.

Using the pile driver machine to install the two front posts, positioned at same level at rails and fasten with two bolts M16x120 with nut and washer (minimum torque 40 Nm). Then, the four back posts are installed (up to the holes) and fasten with four bolts M16x160 with nut and washers (tightening least 40 Nm).

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5. Placement crash cushon

Now you can extend the various elements (modules 0 to 4) until they assumes the working position. The correct distance between the elements is ensured by the placement of bolts at break positioned between the frames and the tracks. The photo above shows the bolts M10x50 cl. 8.8 with nut (yellow oval) to install and tighten with 5 Nm torque. The set of 12 bolts M10x50 cl. 8.8 are defined as "maintenance kit". In fact, for the 90% of the impacts, they are the only elements to be replaced.

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6. Inspections and maintenance

The device does not require maintenance if there is no impact. But it is highly recommended a check of bolts and their tightening torques every two years.

7. Restore after the impact

According to the type and to the seriousness of the impact can be identified different ways to restore the device.

A) In case of frontal impact (in Modul 0) with light or heavy vehicle at any angle, you only have to replace the modules at the correct distance (identified by the holes on the rails) and replace the linking bolts (12 M10x50 cl. 8.8). This is what results from the tests for the certification.

B) In case of lateral impact, there are two possible situations. If the tracks are not deformed you only have to replace the bolts (M10x50 12 cl. 8.8). Whereas, if the tracks are deformed you must replace the tracks and the kit of bolts (M10x50 12 cl. 8.8).

8. Durability

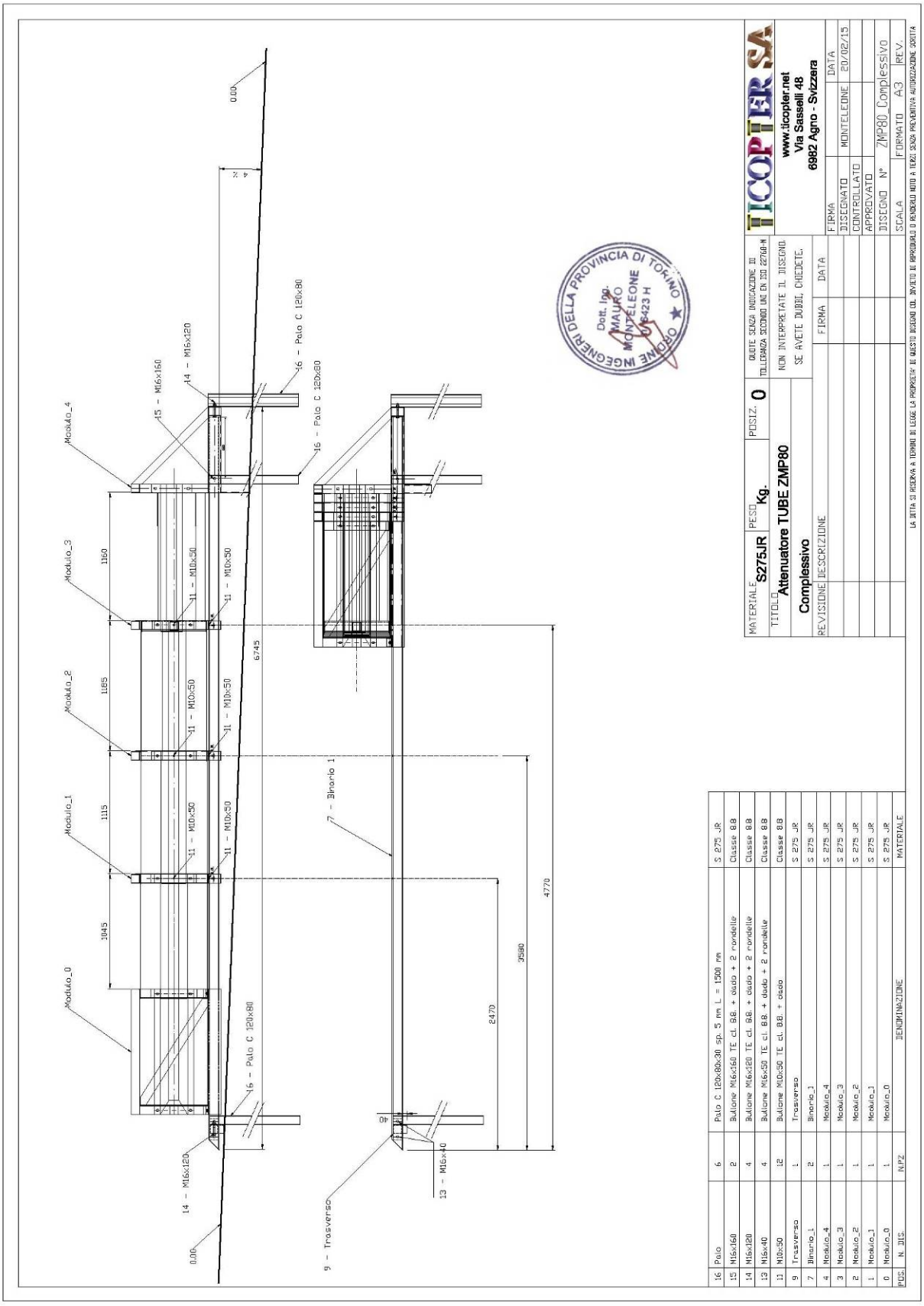
According to UNI 1461 all elements are treated with hot galvanizing process, with minimum thicknesses and coating depending on the thicknesses of the various elements.

9. Law and technical references

UNI EN 1317-3 / 2010 (crash cushions)
UNI EN 1317-5 / 2012 (CE mark)
UNI EN 22768: 1996 (tolerances)

10.Attachments and annexes

Overall design ZMP_80


Modulo_0
Modulo_1
Modulo_2
Modulo_3
Modulo_4
1045
1115
1185
1160
6745
4770
3590
2470
0.00
4 %
14 - M16x120
15 - M16x160
16 - Palo C 120x80
11 - M10x50
7 - Binario 1
9 - Trasverso
13 - M16x40
40
MATERIALE S275JR
PESO Kg.
POSIZ. 0
TITOLO Attenuatore TUBE ZMP80
Complessivo
QUOTE SENZA INDICAZIONE DI TOLLERANZA SECONDO UNI EN ISO 22768-M
NON INTERPRETATE IL DISEGNO SE AVETE DUBBI CHIEDETE.
REVISIONE DESCRIZIONE
FIRMA DATA
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FIRMA
DISEGNATO MONTELEONE 20/02/15
CONTROLLATO
APPROVATO
DISEGNO N° ZMP80_Complessivo
SCALA FORMATO A3 REV.
ORDINE INGEGNERI DELLA PROVINCIA DI TORINO
Dott. Ing. MAURO MONTELEONE
LA DITTA SI RISERVA A TERMINI DI LEGGE LA PROPRIETA' DI QUESTO DISEGNO CON DIVIETO DI RIPRODURLO O RENDERLO NOTO A TERZI SENZA PREVENTIVA AUTORIZZAZIONE SCRITTA
POS. N. DIS. DENOMINAZIONE MATERIALE
16 Palo Palo C 120x80x30 sp. 5 mm L = 1500 mm S 275 JR 6
15 M16x160 Bullone M16x160 TE cl. 8.8 + dado + 2 rondelle Classe 8.8 2
14 M16x120 Bullone M16x120 TE cl. 8.8 + dado + 2 rondelle Classe 8.8 4
13 M16x40 Bullone M16x40 TE cl. 8.8 + dado + 2 rondelle Classe 8.8 4
11 M10x50 Bullone M10x50 TE cl. 8.8 + dado Classe 8.8 12
9 Trasverso Trasverso S 275 JR 1
7 Binario_1 Binario_1 S 275 JR 2
4 Modulo_4 Modulo_4 S 275 JR 1
3 Modulo_3 Modulo_3 S 275 JR 1
2 Modulo_2 Modulo_2 S 275 JR 1
1 Modulo_1 Modulo_1 S 275 JR 1
0 Modulo_0 Modulo_0 S 275 JR 1
N°2