

Plaintiff: Yip Kai Sum: 1st

**IN THE STATE COURTS OF THE REPUBLIC OF SINGAPORE**

Case No. MC/MC 7494/2020

BETWEEN

**GIM TIAN LOGISTICS PTE LTD**  
(UEN No. 199400038D)

... Plaintiff

AND

**1. LIM CHEOW FATT**  
(NRIC No. S0195176I)

**2. TEO LAY HAR (ZHANG LIXIA)**  
(NRIC No. S8740675Z)

... Defendants

**AFFIDAVIT OF EVIDENCE IN CHIEF**

I, **Yip Kai Sum** (NRIC No. S6826267D) of 96, Lorong M Telok Kurau, Singapore 425401 do solemnly and sincerely affirm and state as follows:

1. I am authorised by the Plaintiff to affirm this affidavit on its behalf. The facts stated in this affidavit are from my personal knowledge or taken from documents in the Plaintiff's possession. Where the facts are from my personal knowledge, they are true. Where the facts are taken from documents in the Plaintiff's possession, I believe them to be true.

2. I am also known as Pillipp Yip. I am the Executive Director in a company named Inopave Group Pte Ltd ("**Inopave**"). Inopave was incorporated on 7 March 2003. I have been a director of Inopave since the date of its incorporation.
3. I attach a copy of search document on Inopave based on the records kept by the Accounting And Corporate Regulatory Authority to this affidavit. This copy of the search document is marked as "**YKS-1**".
4. In Singapore, Inopave is the only authorised dealer and the only distributor for the "Scorpion" brand truck mounted attenuators known as the "*TrafFix Scorpion 10,000 TMA*". ("**the Scorpion TMA**" or "**the Scorpion TMAs**")
5. There is a Singapore incorporated company named TMA Systems Pte Ltd ("**TMA Systems**").
6. In addition, there is a partnership business firm named Eng Soon Huat Engineering Works ("**Eng Soon Huat**") in Singapore.

7. The manufacturer of the Scorpion TMAs is a USA company named Traffix Devices Inc. of California ("**the manufacturer**"). I attach a copy of a certificate dated 21 August 2003 issued the manufacturer to this affidavit and mark it as "**YKS-2**".

8. I now refer to the certificate exhibited as "YKS-2" in this affidavit and state the following facts:

- (1) The manufacturer had done an audit and passed TMA Systems to be the distributor for the Scorpion TMAs in Singapore and Hong Kong;
- (2) The manufacturer had done a review and passed Eng Soon Huat's shop practices as being the authorised installer of the Scorpion TMAs in Singapore;
- (3) The manufacturer confirmed that TMA Systems had done an excellent job of installing, maintaining and stocking the Traffix Scorpion 10,000 TMAs; and
- (4) The manufacturer's evaluation listed in the above 3 sub-paragraphs covered the time period from 28 March 2001 through to August 2003.

9. In so far as Singapore as a geographical area is concerned, TMA Systems has appointed the following parties for the Scorpion TMAs business:

- (1) Inopave as the sole authorized dealer for the Scorpion TMAs ; and
- (2) Eng Soon Huat as the only workshop to install or to replace the new units of Scorpion TMAs. In addition, Eng Soon Huat is the only workshop to do the repairs, including the manufacturer's issued spare part replacements for any damaged Scorpion TMAs.

10. To support the facts stated in the immediately preceding paragraph, I attach a copy of certificate dated 24 June 2011 issued by TMA Systems. This copy of the certificate is marked as "YKS-3".

11. I refer to the copy of certificate exhibited as "YKS-3" in this affidavit and state the following facts:

- (1) As the Authorised Dealer for the Scorpion TMAs in Singapore, Inopave has to undertake all commercial matters in relation to the sales and after-sales services for the Scorpion TMAs to customers; and

(2) As the authorised workshop Eng Soon Huat has to undertake all installation, repair and replacement works for all the Scorpion TMAs.

12. To provide for the installation works and repair works for the Scorpion TMAs, Eng Soon Huat operates a workshop situated at Block 1003, Euno Avenue 8, #01-55, Singapore 409498 (**“the ESH workshop”**).
13. In fact, the Scorpion TMA is a safety device. It is in the form of a very huge bumper, mounted at the rear of a heavy lorry. These heavy lorries, mounted with the Scorpion TMAs (**“the TMA lorries”**) are being deployed along expressways or major roads in Singapore where road works are being carried out.
14. In practice, road works can be carried out in front of the deployed TMA lorries. The rear sides of the TMA lorries, fixed with the Scorpion TMAs, are facing on coming downstream vehicles.
15. Should an accident involving any of the TMA lorries occurs, the oncoming downstream vehicle would have collided into the

Scorpion TMA mounted at the rear of the TMA lorry. This Scorpion TMA act as a buffer to the rear of any of the heavy vehicles being used to carry out the road works. The risk of injury to the driver or passenger in the oncoming vehicle is also substantially reduced. At the same time, the risk of the oncoming vehicle colliding directly into the people carrying out the road works is also substantially reduced.

16. For safety reasons, the Land Transport Authority (“**the LTA**”) does require the Scorpion TMAs to be installed in accordance with the manufacturer’s installation procedures and with sound engineering practice. The LTA also require the Scorpion TMAs to be maintained for long term safety serviceability.
17. I attach copies of the following documents to show the LTA’s safety requirements and expectations of the Scorpion TMAs:
  - (1) A letter dated 6 April 2001 written by the LTA to TMA Systems regarding the requirement of the Scorpion TMAs being installed in accordance with the manufacturer’s procedures; and

- (2) A further letter dated 22 May 2001 written by the LTA to TMA Systems regarding the safety and serviceability of the Scorpion TMAs in the long term

These two (2) copies of letters are both marked as “YKS-4”.

- 18. In so far as the sale and after-sale service of the Scorpion TMAs in Singapore is concerned, TMA Systems has made the following arrangements:
  - (1) All the Scorpion TMAs and all their replacement parts have to be sold only through Inopave; and
  - (2) Inopave will not sell any Scorpion TMA and/or any of the replacement parts unless they are installed and/or replaced by Eng Soon Huat.
- 19. With the exception of Eng Soon Huat, it would be impossible for any workshop, intending to repair any damaged Scorpion TMA, to buy a new replacement Scorpion TMAs unit or any of its spare parts in Singapore. Thus, all the works involving the repairs, replacement or installation of any new or used Scorpion TMAs would have to be done only by Eng Soon Huat.

20. In the July 2019 edition of the LTA's Code of Practice for Traffic Control at Work Zone, the LTA provided guidelines for the use of truck mounted attenuators ("**All-TMAs**") for road works (collectively "**the Code of Practice**").
21. In relation to the use, inspections, maintenance and repairs of All-TMAs, I attach the following pages in the Code of Practice as exhibits to this affidavit:
- (1) The front cover page marked as July 2019 Edition;
  - (2) The introductory page nos. 1 and 2
  - (3) Page 23 stating that the guidelines for the safe operation procedure for All-TMAs is detailed in Appendix III;
  - (4) Page nos. 38 and 39 stating that truck mounted attenuators shall be used during short duration and mobile works to absorb the impact of an errant vehicle; and
  - (5) The Appendix III of the Code of Practice in pages 57 to 60.

I mark all the above pages of the Code of Practice as "**YKS-5**".



22. On the topic of inspections, maintenance and repairs of All-TMAs, I wish to refer to the exhibit marked as "YKS-5". In particular, I now quote paragraph 8 on page 59 of the Code of Practice as follows:

**"TMA Inspections, Maintenance and Repairs**

To maintain the crashworthiness of the TMA, User shall ensure regular maintenance and inspection, are carried out by TMA manufacturer's authorised workshop.

User shall keep a copy of maintenance/inspection/and repair records issued by the manufacturer's authorised workshop to ensure proper operation and the safety performance of the TMA Requirements for inspection, maintenance and repair to be carried out by the authorised workshop shall meet the requirements specified by the manufacturer."

23. Thus, all the works involving the replacement/installation of any new Scorpion TMA unit, or involving new replacement parts for any Scorpion TMA, have to be repaired solely by Eng Soon Huat.
24. On or slightly before 19 August 2019, the Plaintiff sent a damaged Scorpion TMA, mounted on to the rear side of a lorry no. XE 3025Z (**"the damaged TMA** and **"the Lorry"** respectively) to the ESH workshop for inspection and repairs.

25. Not long after the damaged TMA, mounted onto the rear side of the Lorry, was sent to ESH's workshop on 19 August 2019, I received a WhatsApp message showing a copy of a "TMA Damages Report" dated 19 August 2019 from one Mr. See Tiong Soon ("**Mr. See**") of Eng Soon Huat. I attach a copy of this "TMA Damages Report" dated 19 August 2019 to this affidavit and marked it as "**YKS-6**".
26. In the document exhibited as "YKS-6" of this affidavit, I note that Eng Soon Huat had stated, amongst others, that: "... 1. Energy Absorber Module "A" S/No: 52867 ... .. 2. Tail Lamp with Bracket (Left) ... .. ."
27. What did Eng Soon Huat mean by the "... 1. Energy Absorber Module "A" S/No: 52867... .. ."? To explain this term, I attach copies of the following documents to this affidavit:
- (1) The front page of a manual entitled "*Installation, Maintenance, and Repair Manual For Scorpion 10,000 TMA*"; and
  - (2) a coloured photograph of a complete Assembly of the Model C Scorpion 10,000 TMA to show the "Module A".

These two pages of the documents depicting the whole of the Model C Scorpion 10,000 TMA and the position of the "Module "A" within the Scorpion 10,000 TMA are collectively marked as **"YKS-7"**.

28. I refer to the exhibits in this affidavit marked as "YKS-7" and state that these documents were issued by the manufacturer of the Scorpion TMAs, TrafFix Devices Inc.
29. On 19 August 2019 and based on the "TMA Damages Report" dated the same day, Inopave prepared a quotation for 10,900.00 (before the 7% GST was added) for the repair works to be done to the damaged TMA.
30. I annex a copy of Inopave's quotation dated 19 August 2019 to this affidavit and mark it as **"YKS-8"**.
31. On or shortly after 20 August 2019, I received a faxed acceptance copy of Inopave's quotation dated 20 August 2019. I note that this acceptance was signed by one Ms. Nan from the Plaintiff's office. She is the Plaintiff's Finance Manager. Ms. Nan's signature and the Plaintiff's company stamp can be seen in the exhibit "YKS-8" in this affidavit.

32. I wish to refer to the exhibit "YKS-8" of this affidavit. Here, Inopave had informed the Plaintiff that the expected delivery of the spare part stated in the "Quotation" by "Indent 60-90 Days.
33. Inopave managed to get hold of the new Module "A" Energy Absorber replacement part on Saturday 7 December 2019. The new replacement part was delivered to the ESH workshop on 7 December 2019. Thus, I requested Mr. See of Eng Soon Huat to make arrangements to repair the damaged TMA as soon as possible.
34. On Monday 9 December 2019, Mr. See telephoned me. There, Mr. See informed me that the damaged TMA, mounted onto the rear side of the Lorry had been repaired. I then left it to ESH to liaise with the Plaintiff's representative(s).
35. Later that day on 9 December 2019, Mr. See informed me via the telephone that the Plaintiff's representative went to ESH's workshop. There, the Plaintiff's representative drove the Lorry, fitted with the newly repaired Plaintiff's TMA, away from the ESH workshop.

36. On the same day on 9 December 2019, I went to the Plaintiff's office at 24, Loyang Crescent, Loyang Industrial Estate, Singapore 508987. There, I presented Inopave's Tax Invoice for \$11,663.00 to the Plaintiff's Ms. Nan. I also asked Ms. Nan to sign on the *Delivery Order* for Inopave.
37. I annex a copy of Inopave's *Delivery Order* and a copy of Inopave's Tax Invoice, both dated 9 December 2019 to this affidavit. These copies of documents are collectively marked as "YKS-9".
38. I wish to stress that ESH did not issue any document to the Plaintiff for the repair works done on the damaged TMA at all. This is because of the arrangements that Inopave, as the sole authorized dealer for the Scorpion TMAs, had to bill the Plaintiff for repair works that ESH had carried out on the Plaintiff's TMA.
39. For safety reasons, ESH and Inopave do not get involved whatsoever in the assembly, the repairing or the replacement any damaged Scorpion TMA with any of the following:
- (1) Any second-hand complete Scorpion TMA replacement unit imported from overseas; and

(2) Any second-hand replacement parts for any Scorpion TMAs imported from overseas.

40 Again for safety reasons, ESH, Inopave and TMA Systems do not import any second-hand Scorpion TMA or any second-hand replacement parts for any Scorpion TMA into Singapore.

41. Yet further, all the works involving the repairs, replacement and installation of any Scorpion TMA unit, or involving new replacement parts of any Scorpion TMA, have to be repaired solely by Eng Soon Huat.

AFFIRMED by the abovenamed )  
 )  
 YIP KAI SUM on this 8<sup>th</sup> day )  
 )  
 of September 2021 in the )  
 )  
 presence of:

Before me,

A COMMISSIONER FOR OATHS



*This is the Exhibit marked "YKS-1"*

*referred to the Affidavit of Evidence in Chief*

*of*

YIP KAI SUM

8 SEP 2021

*affirmed before me this .....*

*Before Me*

  
A Commissioner for Oaths



## Business Profile (BPFCOY)

INOPAVE GROUP PTE. LTD.

### Particulars

**Name** : INOPAVE GROUP PTE. LTD.  
**Registration Number / UEN** : 200302075E  
**Registration Date** : 07-03-2003  
**Name Effective Date** : 06-04-2005  
**Country of Incorporation** : SINGAPORE  
**Company Type** : EXEMPT PRIVATE COMPANY LIMITED BY SHARES  
**Registered Address** : 24 SIN MING LANE  
#05-107 MIDVIEW CITY  
SINGAPORE 573970  
**Address Effective Date** : 03-01-2011  
**Status** : LIVE COMPANY  
**Status Effective Date** : 07-03-2003  
**Principal Activity Code (I)** : 46900  
**Principal Activity Description (I)** : Wholesale trade of a variety of goods without a dominant product  
**Principal Activity Code (II)** : 46100  
**Principal Activity Description (II)** : Wholesale on a fee or contract basis (e.g. commission agents)  
**Amalgamation Details** : -

### Former Name(s)

No.	Former Name	Date of Change
1	INNOPAVE PTE. LTD.	07-03-2003



**Capital**

Type	No. of Shares	Issued/Amount	Paid-Up	Currency
Ordinary	80,000	80,000.00	80,000.00	SINGAPORE, DOLLARS

**Auditor(s)**

NIL

**Charge(s)**

NIL

**Officer(s)**

No.	Name	ID	Nationality	Position	Date of Appointment
1	LOI PO CHII	A3890950	MALAYSIAN	DIRECTOR	07-03-2003
Address					
367 KUMPUNG JERING 32400 AYER TAWAR PERAK MALAYSIA					

No.	Name	ID	Nationality	Position	Date of Appointment
2	NG LAY HOON	S1446541C	SINGAPORE CITIZEN	SECRETARY	07-03-2003
Address					
24 SIN MING LANE #05-107 MIDVIEW CITY SINGAPORE 573970					

No.	Name	ID	Nationality	Position	Date of Appointment
3	YIP KAI SUM	S6826267D	SINGAPORE CITIZEN	DIRECTOR	07-03-2003
Address					
96 LORONG M TELOK KURAU SINGAPORE 425401					

**Shareholder(s)**

No	Name	ID	Nationality	Address
1	LOI PO CHII	A3890950	MALAYSIAN	367 KUMPUNG JERING 32400 AYER TAWAR PERAK MALAYSIA
Share Category	Share Type	Share Allocation	Currency	
INDIVIDUAL	ORDINARY SHARES	8,000	SINGAPORE, DOLLARS	

No.	Name	ID	Nationality	Address
2	YIP KAI SUM	S6826267D	SINGAPORE CITIZEN	96 LORONG M TELOK KURAU SINGAPORE 425401
Share Category	Share Type	Share Allocation	Currency	
INDIVIDUAL	ORDINARY SHARES	72,000	SINGAPORE, DOLLARS	

**Compliance Records**

Date of Last AGM : 31-12-2019  
Date of Last AR : 31-01-2020  
Date of A/C Laid at Last AGM : 30-06-2019

**Disclaimer**

The information in this report is extracted by BizInsights from a database comprising information filed with the Accounting & Corporate Regulatory Authority (ACRA) on or before 22 April 2020 and presented using a business intelligence solution. The statements or ratios published by BizInsights are solely statements of opinion and not statements of fact or recommendations to purchase, hold, or sell any securities or make any other investment decisions. Subscribers should not rely on any such statements or ratios in making any investment decision. This report may not be reproduced in whole or in part in any form or manner. The report may contain information compiled from information which ACRA and BizInsights do not control and which has not been verified unless indicated in this report. Whilst every endeavor is made to ensure that the information provided is updated and correct, ACRA and BizInsights disclaim any liability for any damage or loss that may be caused as a result of any error or omission arising out of or in any way related to the contents of this report. Certain figures in the financial statements may have been adjusted for analytical classification purposes in accordance with established methodology and research processes.

*This is the Exhibit marked "YKS-2"*

*referred to the Affidavit of Evidence in Chief*

*of*

YIP KAI SUM

8 SEP 2021

*affirmed before me this .....*

*Before Me*

  
A Commissioner for Oaths





20

August 21, 2003

**Certification**

**TraFFix Devices Scorpion 10,000 TMA**

Gentleman:

This is to certify that TMA Systems PTE Ltd has passed the TraFFix Devices distributor audit and that their installer (Eng Soon Huat Engineering Works) in Singapore has also passed a review of their shop practices. In addition their dealer in Hong Kong (Tug Link Trading and Engineering Services Ltd.) has passed a similar review process.

This audit confirms that TMA systems PTE Ltd. has done an excellent job of installing, maintaining, and stocking the TraFFix Scorpion 10,000 TMA. This evaluation covers the time period of March 28, 2001 through August 20, 2003.

Sincerely,

**Dave Gertz**  
Director of Engineering

Signature:

  
\_\_\_\_\_  
Dave Gertz  
Director of Engineering

220 Calle Platorre  
San Clemente, California 92672  
(949) 361-5583  
FAX (949) 361-8205  
[www.traffixdevices.com](http://www.traffixdevices.com)



*This is the Exhibit marked "YKS-3"*

*referred to the Affidavit of Evidence in Chief*

*of*

YIP KAI SUM

8 SEP 2021

*affirmed before me this .....*

*Before Me*

  
A Commissioner for Oaths





# TMA SYSTEMS PTE LTD

Blk 1003 Eunos Avenue 8  
#01-55  
Eunos Industrial Estates  
Singapore 409498

22  
Tel : (65) 6278 8818  
Fax : (65) 6274 6486  
ROC No : 200002807D  
GST Reg No : 200002807D

24 June 2011

## TO WHOM IT MAY CONCERN

**Subj : Authorised Workshop for Installation, Repair and Replacement of  
Traffix Devices Inc – "Scorpion" TMAs**

"Scorpion" TMA is a proprietary product developed and manufactured by Traffix Devices Inc in conformance to the NCHRP – Test Report 350 guidelines accepted by the Land Transport Authority.

As part of the Distributor Agreement, Traffix Devices Inc requires their Distributor/Dealers to their Audit, for Approved/Authorised workshops to undertake the installation, repair and replacement of the "Scorpion" TMAs.

In Singapore, our Authorised Dealer – Inopave Group Pte Ltd - undertake all commercial matters in relation to the sales and after-sales services pertaining to "Scorpion" TMAs to their customers.

Our authorised workshop – Eng Soon Huat Engineering approved by Traffix Devices Inc undertake all installation, repair and replacement works pertaining to "Scorpion" TMAs (attached is copy of Traffix Devices Inc letter in reference to their audit accreditation for our authorised workshop).

We trust this statement letter explain and clarify the queries raised by to whom it may concerned.

Thank you for your kind attention and cooperation.

Yours faithfully,

**TMA SYSTEMS PTE LTD**

Francis Fong  
Director  
AUTHORISED DISTRIBUTOR

cc Mr Jack Kulp -Traffix Devices Inc



*This is the Exhibit marked "YKS-4"*

*referred to the Affidavit of Evidence in Chief*

*of*

YIP KAI SUM

8 SEP 2021

*affirmed before me this .....*

*Before Me*

  
A Commissioner for Oaths



10 Sin Ming Drive Singapore 575701  
Tel: (65) 3757100 Fax: (65) 5535329

24

6 Apr 2001

Mr Ng Wee Kang  
Director  
TMA Systems Pte Ltd  
Blk 1002 Eunos Ave 8  
#02-54 Singapore 409497  
(Fax: 8416087)

Our ref LTAVEN/30.017.000/15  
Your ref  
DID 5535267 Fax 5535329

Dear Mr Ng,

**APPLICATION FOR ATTACHMENT OF SCORPION C 10,000 TRUCK  
MOUNTED ATTENUATOR (TMA) ON 3-AXLE GOODS VEHICLES**

Please refer to your letter dated 20 Mar 2001.

As the installation and use of the Truck Mounted Attenuator (TMA) can enhance road safety, we have no objection to your request to install the TMA on 3-axle goods vehicles, subject to the following conditions :

- a) You and your appointed distributor are required to ensure that all installation works are performed in accordance with the manufacturer's installation procedures and with sound engineering practice;
- b) You are to ensure that the registered Maximum Laden Weight of the 3-axle goods vehicle is able to accommodate the increase in the unladen weight caused by the installation of the TMA. This means that there will be a reduction in the payload of the vehicle and the owner should be informed of the payload reduction;
- c) The TMA shall be fitted with an integral trailer lighting system including brake lights, tail lights and signal lights, etc.; and conspicuously marked so that it is visible to other road users.



Please also inform the vehicle owner / operator that the TMA should be in its upright position (fully folded) during normal travelling on the roads, i.e. when moving to and from work deployment area. This is because the TMA, in a horizontal position, will increase the rear overhang of the vehicle substantially, which could affect the vehicle's manoeuvrability.

25

Yours sincerely



WONG YUEN KEAT  
for MANAGER VEHICLE ENGINEERING  
VEHICLE & TRANSIT LICENSING DIVISION

Facsimile

Land Transport  Authority

No. 1 Hampshire Road  
Block 3 Level 2 Singapore 219428  
Tel: (65) 3962004 Fax: (65) 3961140

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To TMA Systems Pte Ltd  
Attn.: Mr Francis Fong  
From Ho Tuck Kai

Your ref:  
Our ref: RM34.4  
Fax no 841 6087  
Fax no 396 1140  
Date 22 May 2001  
No of pages 1 (including this page)

**RE: SCORPION TMA BY TRAFFIX DEVICES INC - REQUEST FOR APPROVAL**

I refer to your letter dated 26 Mar 2001.

2. We are very pleased to note in the letter your commitment to provide a set up for training and inspection to ensure the long-term serviceability of the TMA supplied by you.
3. Together with the test report (NCHRP Report 350 Test Level 3) submitted earlier, we consider the Scorpion TMA 10,000 Model B & Model C to be acceptable for use on roads with speed limit of 70 km/hr or more and on expressways. This approval shall be withdrawn if subsequently you fail to comply with the requirements of LTA for the TMA.
4. A separate clearance from our Vehicle & Transit Licensing Division is necessary for installation of the TMA to the vehicle.

Regards.



Ho Tuck Kai  
for Manager  
Road Management

*This is the Exhibit marked "YKS-5"*

*referred to the Affidavit of Evidence in Chief*

*of*

YIP KAI SUM

8 SEP 2021

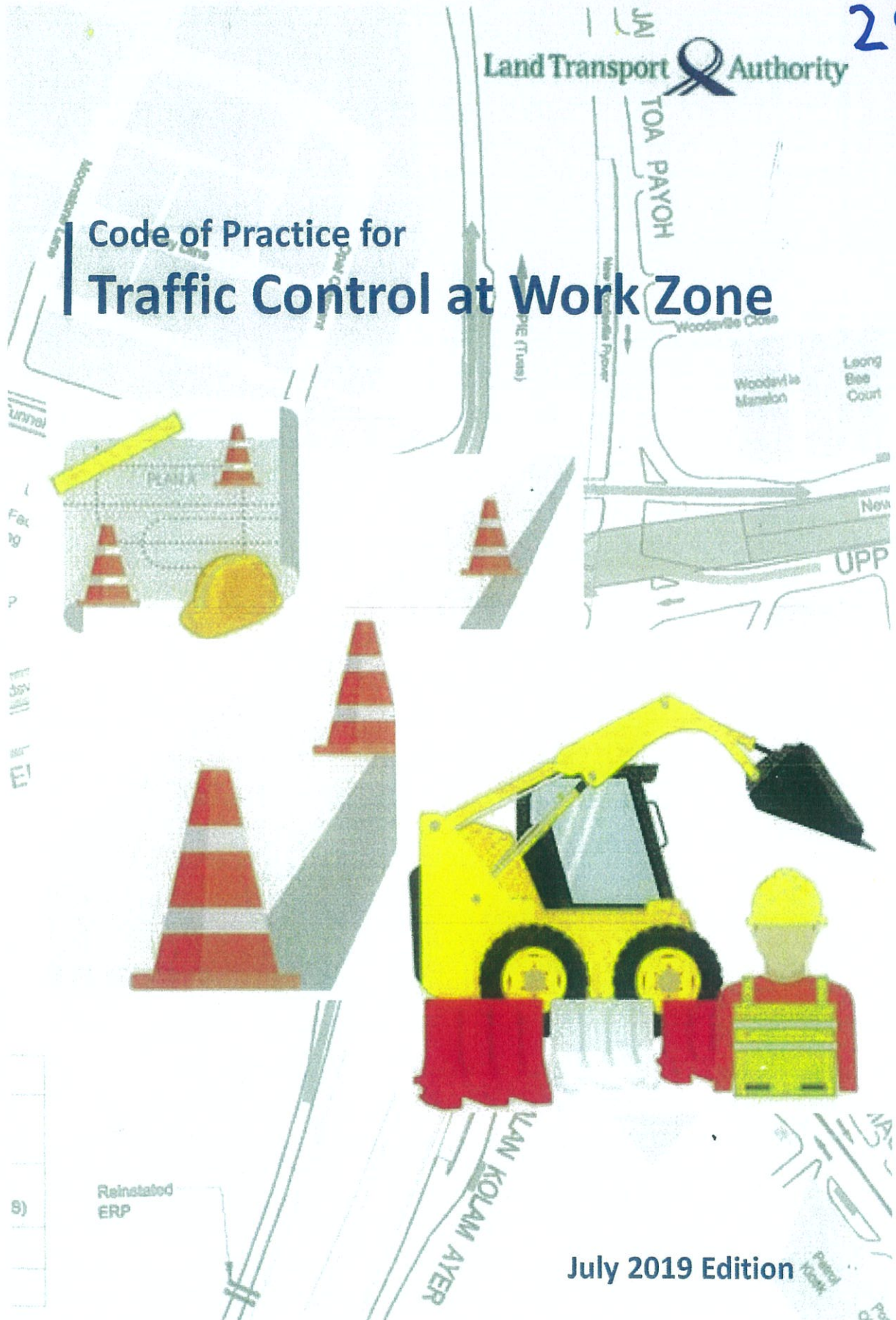
*affirmed before me this .....*

*Before Me*

  
A Commissioner for Oaths



# Code of Practice for Traffic Control at Work Zone



July 2019 Edition



## Code of Practice for Traffic Control at Work Zone

July 2019 Edition

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The Code of Practice (COP) for Traffic Control at Work Zone was published by Land Transport Authority (LTA), Singapore, to provide those involved in construction activities within the public street a comprehensive guide to temporary traffic control. The COP explains the fundamental principles for the provision of good traffic control and also gives a detailed guide on planning and designing the traffic control plan for the safety of road users.

This July 2019 Edition comes into effect on 1 July 2019 and supersedes all previous editions.

Clarifications on any aspect of this COP may be made with the Road Asset Regulation & Licensing Division of LTA, Singapore.

### Origin and Development of Code of Practice for Traffic Control at Work Zone

Conflicts between traffic and works on or next to the road are inevitable. It is important to reduce such conflicts to optimise work efficiency and traffic safety, and to minimise traffic congestion, delay and inconvenience to road users.

The first COP for **Temporary Traffic Control** was published in June 1998 and dealt with the specific work area in the carriageway and its corresponding traffic control arrangement. This proved to be useful in providing contractors with typical temporary traffic control arrangement but inadequate when major temporary traffic schemes are involved. In June 2001, the COP for **Traffic Control at Work Zone** was published to provide those involved in all forms of construction activities within the road reserve with a comprehensive guide to temporary traffic control. In June 2006, general improvements were made to COP for **Traffic Control at Work Zone** to enhance its user-friendliness. Following that, periodically updates were also made to reflect any change in requirements such as new traffic control devices that have been introduced into the industry.

Given the increase in construction activities within the road reserve due to rapid developments and more demands for bigger capacity utility services in recent years, a comprehensive review of the COP was necessary to ensure that it continues to remain user-friendly and relevant from the planning to operations of temporary traffic control in a work zone.

Under this July 2019 Edition, the content had been condensed from 5 Chapters into 4 Chapters with more pictorials for users to better appreciate the requirements of temporary traffic control at work zone to enhance overall safety of working on public streets. Other revisions include a flowchart to guide users on the necessary checks to be carried out and physical improvements to ensure safe deployment of Truck Mounted Attenuator (TMA) at work zones.

Although the COP does not cover every possible situation, the emphasis is nevertheless on *safety first* under any situation. The safety philosophy for carrying out works on public streets is aptly epitomised by the maxim: "It is the works that should adapt to the traffic conditions whenever and wherever possible and not for the traffic to adapt to the convenience of the works!"

It has been assumed that the execution of the provisions in this Code is entrusted to suitably qualified and experienced people, for whose guidance it was prepared. Always consult a qualified person about the provision of temporary traffic control. In situations where the qualified person needs clarifications, he shall seek advice from the Authority.

Compliance with this COP does not of itself confer immunity from legal obligations.

This Code of Practice on Traffic Control at Work Zone is issued by the Land Transport Authority under Regulation 12 of the Street Works (Works On Public Streets) Regulations 1995. It deals with the standards, procedures and other requirements pertaining in particular to paragraph 2(a) of Regulation 12 for carrying out works on public streets.

LAND TRANSPORT AUTHORITY

- (4) **After the workday (inclusive of weekends and holidays)**
- (a) Assign personnel to inspect and maintain the devices.
  - (b) Provide after-hours contact for replacing damaged and displaced devices.
  - (c) Record all damaged or displaced devices.

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### 3-10 Closing out Procedure

- 3-10.1 The following routine shall be followed when carrying out permanent reinstatement works: -
- (a) Reinstall all markings and make good all defects on road.
  - (b) Restore all permanent signs that were covered or removed.
  - (c) Clean up the site.
  - (d) Remove the temporary devices by following a safe procedure.
  - (e) Rectify all permanent devices before installation.
  - (f) Ensure that the permanent devices are in order of original positions before leaving the site.

### 3-11 Safe Operation Procedure for Truck Mounted Attenuator (TMA)

- 3-11.1 Only trained driver/operator is allowed to operate the TMA. The operator shall carry out daily routine checks on all items contained in the inspection checklist provided by the manufacturer and maintain the TMA in tip-top condition. The guidelines for use of TMA for road works is detailed in **Appendix III**.





Example of plastic barricade posts and double boards

- 4-16.2 **Application** — It shall be erected without gaps along pedestrian paths throughout the activity work zone for the control of pedestrian movement. Plastic barricades shall not be used on carriageway and/or if heavy pedestrian movement is expected.

They shall not be used next to deep excavations or steep falls and shall be placed such that a minimum distance of 500mm separates the plastic barricade and the excavated pit.

#### 4-17 Impact Attenuator (Stationary & Truck Mounted)

- 4-17.1 **Design** — Impact attenuator is an energy-absorbing device. This product shall pass acceptable performance test (NCHRP 350 or the AASHTO Manual for Assessing Safety Hardware (MASH) standards TL-3) and be designed for each application to ensure performance.

- 4-17.2 **Application** — Stationary attenuators or crash cushions shall be used only if other suitable end treatments are not appropriate as the leading terminal of a safety barrier for works along expressways and other roads where the operating speed limit is  $\geq 70\text{km/h}$ . For other road environments, a crash cushion is also warranted at high risk locations such as at a road bifurcation. As crash cushions are proprietary products, they shall be designed and installed by the Manufacturer Certified Installer.



Example of a stationary attenuator system



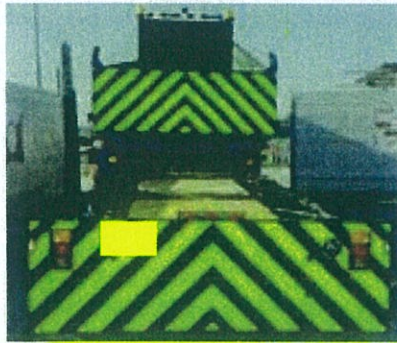
Use of crash cushion to shield the leading terminal of the w-beam VIG



Use of crash cushion to shield the leading terminal of the concrete safety barrier

- 4-17.3 Truck mounted attenuators attached to the rear of protective vehicle shall be used during short duration and mobile works to absorb the impact of the errant vehicle.





Example of a truck-mounted attenuator (TMA)

#### 4-18 Visibility Enhancing Devices

- 4-18.1 They are mounted on supports, barricades, barriers or other channelling and delineation devices to warn road users/ worker/ motorists by enhancing the visibility of the temporary traffic control devices, and hazards within the work zone particularly at night.

#### 4-19 Retro-reflective Disc

- 4-19.1 Design — It is a 200mm round disc fitted with Fluorescent Orange Wide Angle Microprismatic Retro-reflective sheeting on an aluminium plate or any other suitable mounting substrate. Sheeting specifications shall be in accordance to Type IX and above sheeting classification specified in the prevailing version of *ASTM D4956 Standard Specification for Retro-reflective Sheeting for Traffic Control*.



Example of retro-reflective disc

- 4-19.2 Application — Retro-reflective discs are to be spaced at regular intervals to provide a continuous line of sight. The interval shall be 6m c/c and 10m c/c for minor roads and expressways/ major roads respectively. It is an economical and effective visual enhancing device. It shall be mounted facing the direction of the traffic, at about 1m above the ground on the delineation devices. It shall not be used for pedestrian footpath and off-road areas.

#### 4-20 Flashing Beacons

- 4-20.1 **Design** - It is a portable, lens-directed, and enclosed amber light device (200mm diameter). It shall be able to operate in STEADY mode or FLASHING mode comply with the prevailing version of *BS EN 12352*.
- 4-20.2 **Application** — Beacons should space at regular intervals to provide a continuous line of sight:
- (a) Minor road - 6m c/c
  - (b) Major road - 10m c/c
  - (c) Expressway - 10m c/c

# APPENDIX III - Truck Mounted Attenuator

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## Guidelines for use Truck Mounted Attenuator (TMA) for Road Works

### 1. General

The primary objective of these guidelines is to provide a standard guidance for the application for TMA to be used on public roads. Refer to Figure A for the Process for Use of TMA for Roads Works.

### 2. Definitions

“TMA” used refers to truck-mounted attenuator.

“User” used hereinafter is defined as the contractor/agencies who are using the TMA (regardless of self-ownership or rental) on public roads of posted speed of 70 km/h or more.

“Operator” used hereinafter is defined as the person who has been trained and certified by TMA manufacturer authorised trainer/centre to correctly perform the TMA. He may also double up as the shadow vehicle driver.

“Shadow Vehicle” is defined as the LTA-approved truck where the TMA is mounted on.

“NCHRP” refers to National Co-operative for Highway Research Program commissioned by American Association of State Highway and Transportation Officials and US Federal Highway Administration.

“MASH” refers to Manual for Assessing Safety Hardware. The rewrite of NCHRP 350 and was review by the ASSHTO Technical Committee on Roadside Safety (TCRS).

### 3. Compliance

Truck mounted attenuator unit mounted on the shadow vehicle shall meet both the mandatory and optional requirements as stated in the NCHRP 350 Report TL-3 or the AASHTO Manual for Assessing Safety Hardware TL-3 (MASH).

The TMA shall have documentary evidence to prove that it has been successfully crash tested following the procedures set forth in the NCHRP Report 350 or MASH.

To allow the use of collision attenuator or TMA on the public roads, User shall ensure the following report/letter to Road Asset Regulation & Licensing (RARL) of LTA to show the compliance of the above-mentioned standards:

1. A copy of crash summary report, together with sequential photos from ISO certified test centre qualified to conduct NCHRP Report 350/MASH impact tests; or
2. A copy of acceptance letter/report from United States of America Federal Highway Administration (FHWA)

### 4. Installation

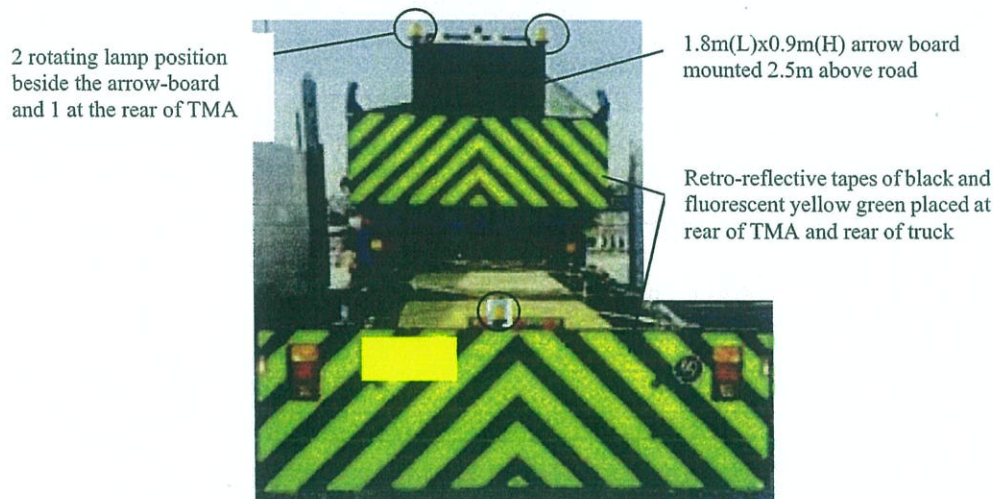
The TMA shall be installed by a workshop authorised by the TMA manufacturer in accordance with the Drawings approved by Vehicle Approval & Control (VAC) of LTA.



## 5. Warning Devices and Retro-reflective Sheeting

TMA warning devices and retro-reflective sheeting shall meet the following requirements:

- 1) 2 rotating lamps positioned beside the arrow-board and 1 rotating lamp at the rear of TMA. Rotating lamps installed on TMA shall comply with the latest prevailing version of United Nations Economic Commission for Europe (UNECE) Regulation 65 on Special Warning Lamps;
- 2) Retro-reflective sheeting of black and florescent yellow green affixed at rear of TMA and rear of shadow vehicle. The retro-reflective sheeting specifications shall meet Type IX and above of the prevailing version of *ASTM D4956*.
- 3) The flashing arrow board shall be mounted 2.5m above the road surface. The arrow board shall conform with the following specifications:
  - a. Arrow board shall be a minimum of 1.8m (L) x 0.9m (H);
  - b. Flashing lamps shall flash at a minimum rate of 65 flashes per minute during operations;
  - c. Comprise a minimum of 15 flashing lamps with 140mm in diameter.
  - d. Flashing arrow shall be clearly visible and legible from a minimum distance of 700m during day and night operations.



Truck Mounted Attenuator Warning Devices and Retro-reflective Sheeting

## 6. Longitudinal Buffer Distance

For mobile operations, the driver of the shadow vehicle shall remain in the vehicle at all times. The shadow vehicle shall be properly spaced behind the working vehicle. The shadow vehicle shall maintain a minimum longitudinal buffer distance of 30<sup>(1)</sup> m behind the working vehicle. This distance shall remain constant as the work progresses down the road / expressway.

For stationary operations, the shadow vehicle shall be properly spaced behind the work crew and maintain a minimum longitudinal buffer of 15<sup>(1)</sup> m behind the start of work area.

Types of TMA operation	Minimum Longitudinal buffer distance (m)
Mobile TMA	30 <sup>(1)</sup>
Stationary TMA	15 <sup>(1)</sup>

Note:

- (1) Cross-check with TMA manufacturer's recommended longitudinal buffer distance and adopt the longer buffer distance to be implemented on site.

Longitudinal Buffer Distance for TMA

**7. TMA Manufacturer Trainer/Centre**

The authorised training centre shall keep records and issue certificates to TMA operators. The certificate shall contain following details:

- Name of the operator
- NRIC /FIN
- Date of training
- Model and serial number of TMA

TMA Operator shall produce the certificate for inspection, whenever is required by the Authority during their routine audit checks.

**8. TMA Inspections, Maintenance and Repairs**

To maintain the crashworthiness of the TMA, User shall ensure regular maintenance and inspection, are carried out by TMA manufacturer's authorised workshop.

User shall keep a copy of maintenance/inspection/and repair records issued by the manufacturer's authorised workshop to ensure proper operation and the safety performance of the TMA. Requirements for inspection, maintenance and repair to be carried out by authorised workshop shall meet the requirements specified by the manufacturer.



### Process for the use of TMA for Road Works



Truck mounted attenuator unit mounted on the shadow vehicle shall meet both the mandatory and optional requirements as stated in the NCHRP 350 Report TL-3 level or the AASHTO Manual for Assessing Safety Hardware TL-3 (MASH).

To allow the use of collision attenuator or TMA on the public roads, User shall ensure the following report/letter to Road Asset Regulation & Licensing (RARL) of LTA to show the compliance of the above-mentioned standards:

- 1) A copy of crash summary report, together with sequential photos from ISO certified test centre qualified to conduct NCHRP Report 350/MASH impact tests; or
- 2) A copy of acceptance letter/report from United States of America Federal Highway Administration (FHWA)

Prior to deployment of TMA on the public roads, the User shall ensure that the TMA manufacturer had appointed an authorised workshop and certified product trainer/training centre in Singapore.

User shall ensure the following documents via the VITAS under the Drawing Approval application to Vehicle Approval & Control (VAC) of LTA for approval:

- (1) An A3-sized technical drawing, endorsed by a Professional Engineer (Mechanical) showing the:
  - a) Plan view – with stowed and deployed state of the TMA;
  - b) Side view - with stowed and deployed state of the TMA;
  - c) Front view;
  - d) Rear view - with stowed and deployed state of the TMA; and
  - e) Details such as - Weight Summary, Dimensions, Component's Annotation, Travelling Condition and etc.
- (2) Weight distribution and Stability calculations - endorsed by the same PE.
- (3) Certificate of endorsement for the drawing approval application by the same PE.
- (4) Technical specifications of the shadow vehicle and TMA, as well as compliant certification of the TMA.

Issuance of the Notice of Drawing Approval with approval code.

User shall ensure the TMA is installed by a workshop authorised by the TMA manufacturer in accordance with the Drawing approved by VAC.

The certificate of installation issued by the workshop shall contain the following details:

- a) Shadow vehicle registration plate number;
- b) Date of TMA installation;
- c) Model and serial number of TMA;
- d) Approval code.

User shall ensure TMA operators are trained and certified by TMA manufacturer authorised trainer/centre.

The authorised training centre shall keep records and issue certificates to TMA operators. The certificate shall contain following details:

- a) Name of the operator,
- b) NRIC /FIN,
- c) Date of training,
- d) Model and serial number of TMA.

User shall ensure the certifications for TMA installation and TMA operator training are available for inspection, whenever is required by the Authority during their routine audit checks.

**Figure A - Process for the use of TMA for Road Works**

*This is the Exhibit marked "YKS-6"*

*referred to the Affidavit of Evidence in Chief*

*of*

YIP KAI SUM

8 SEP 2021

*affirmed before me this .....*

*Before Me*

  
A Commissioner for Oaths



39

**TMA DAMAGES REPORT**

To: *Indopare Group Pte Ltd*

Ref: *TMA/R/1913*  
 Date: *19/8/19*  
 Tel:  
 Fax:

Attn: *Mr. Philip Yip*

Vehicle's No: *XE 3025 Z (Gin Tian)*

TMA S/No: *10021*

Parts Damage and To Be Replace:

S/no	Descriptions	Qty	Remark
1.	<i>Energy Absorber Module 'A'</i>	<i>1</i>	<i>NO</i>
	<i>S/No: 52867</i>		
2.	<i>Tail Lamp with Bracket (Left)</i>	<i>1</i>	<i>NO</i>

Yours Truly,

*[Signature]*

See Tiong Soon  
See Tiong Soon

*See Tiong Soon*  
*C/O TMA systems private*

*This is the Exhibit marked "YKS-7"*

*referred to the Affidavit of Evidence in Chief*

*of*

YIP KAI SUM

8 SEP 2021

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A Commissioner for Oaths



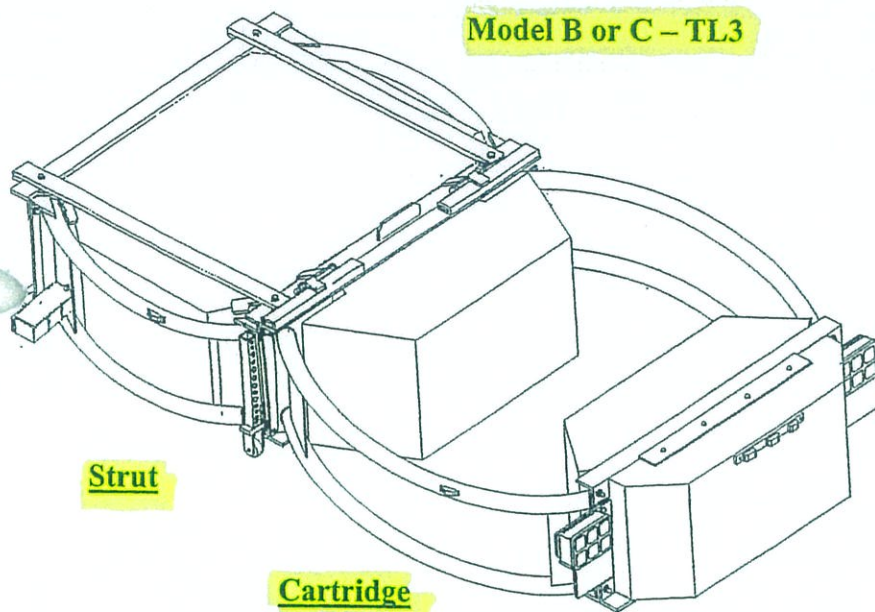


# Installation, Maintenance, and Repair Manual

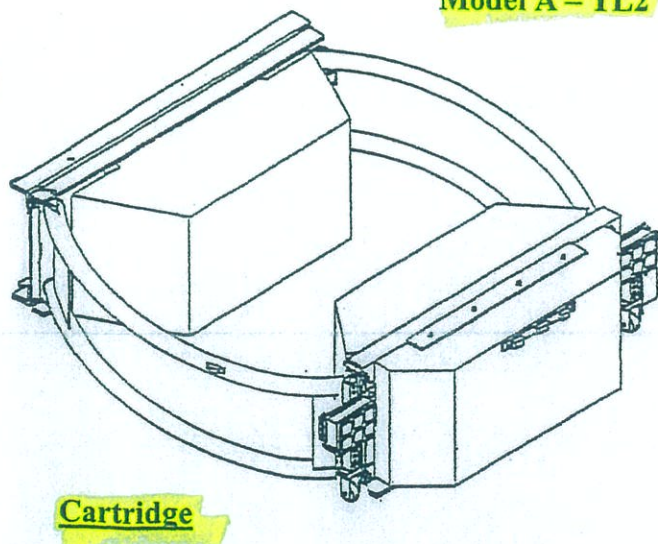
41

## For Scorpion 10,000 TMA

Model B or C – TL3



Model A – TL2



**TraFFix**  
**Devices Inc.** 

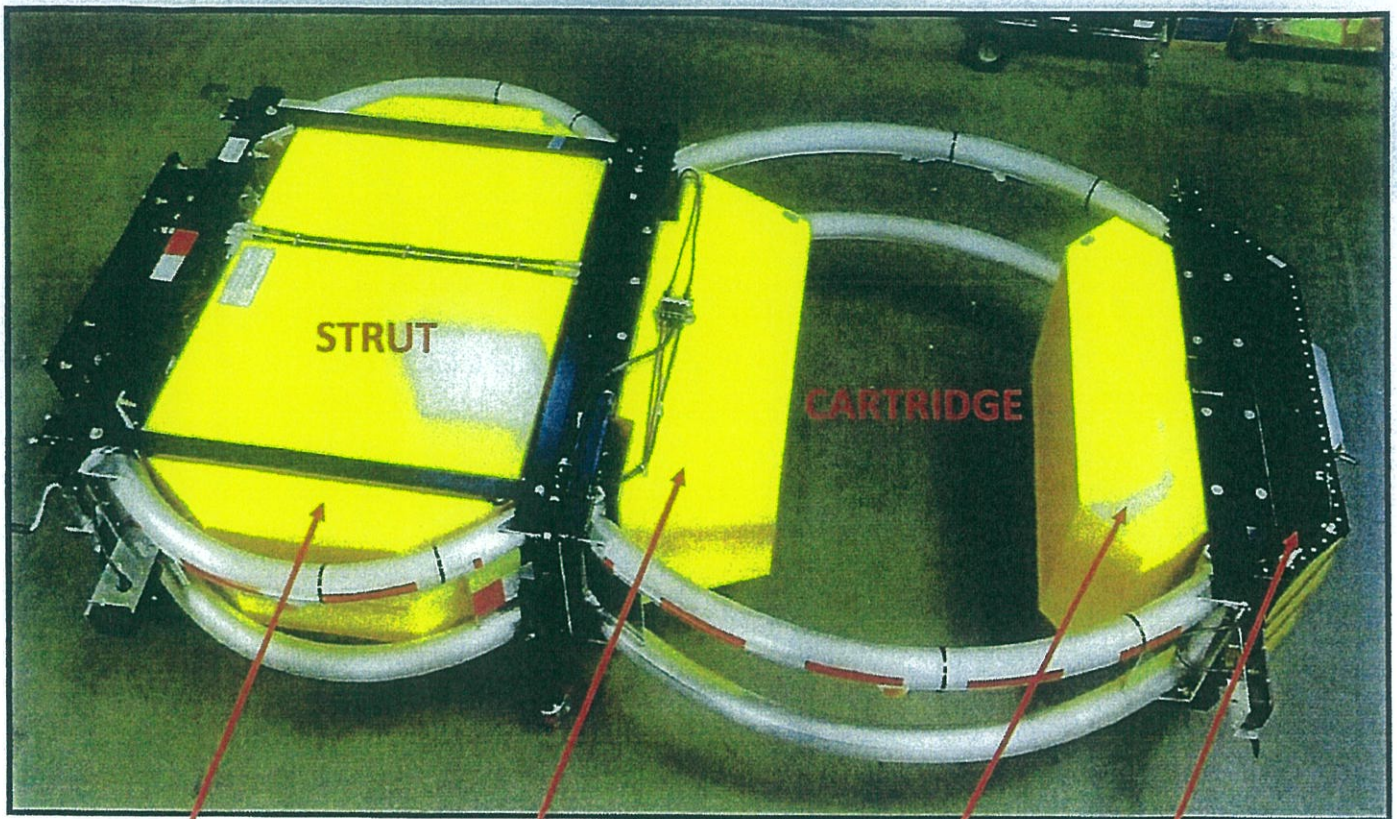
160 Avenida La Pata  
San Clemente, CA 92673  
(949) 361-5663  
FAX (949) 361-9205  
[www.traffixdevices.com](http://www.traffixdevices.com)

Revision C (Dated 11/5/03)



# Complete Assembly of Model C

42



Module D

Module C

Module B

Module A





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**INOPAVE** GROUP PTE LTD  
No: 96, Lorong M, Telok Kurau  
Singapore 425401  
Tel: 65-6284 8551 Fax: 65-6285 8106  
<http://www.inopave.com>

44

Co. Reg. No. : 200302075E  
GST Reg. No.: 20-0302075-E

**QUOTATION : IN/Q/0305/0712**

(Please refer to this number in all correspondence)

To : <b>GIM TIAN LOGISTICS PTE LTD</b> 24 Loyang Crescent, Loyang Industrial Estate. Singapore 508987 Tel : 6291 2396 , Fax: 6292 6737 Attention: Mr. Ang				
<b>Estimated Delivery Time</b>		<b>Term</b>		<b>Date</b>
Indent 60-90 Days		COD		19/08/2019
<b>Item</b>	<b>Description</b>	<b>Qty</b>	<b>Unit Prices ( SGD )</b>	<b>Amount ( SGD )</b>
	Supply & Install Scorpion Model 10,000 Truck Mounted Attenuator for Truck XE 3025Z. ( S/N: 10021)			
1	P/N: 10400A Module A Energy Absorber	01	9,500.00	9,500.00
2	Tail Lamp with bracket ( Left )	01	200.00	200.00
3	Full Labour Cost , dismantling, removing, installation, repairing, re-alignment	-	1,200.00	1,200.00
	<b><u>Grand Total</u></b>			<b>10,900.00</b>

E. & O.E

Validity : Thirty (30) days from the date of issue of this quotation.

GST : 7%

**Please sign and return the duplicate copy of the quotation to us as confirmation of your acceptance. Your order will be processed promptly. Thank you.**

Prepared By :

Accepted By :

Name : Louis Chia  
Designation : Sales Executive



Name : NAN  
Designation : ACCOUNT  
Date : 20/8/19  
Company Stamp:

45

*This is the Exhibit marked "YKS-9"*

*referred to the Affidavit of Evidence in Chief*

*of*

YIP KAI SUM

8 SEP 2021

*affirmed before me this .....*

*Before Me*

  
A Commissioner for Oaths





**INOPAVE** GROUP PTE LTD  
No: 96, Lorong M, Telok Kurau  
Singapore 425401  
Tel: 65-6284 8551 Fax: 65-6285 8106  
<http://www.inopave.com>

46


Co. Reg. No. : 200302075 E  
GST Reg. No.: 20-0302075-E

**DELIVERY ORDER NO.: IN/LD/0503/0582**

Deliver To : <b>GIM TIAN LOGISTICS PTE LTD</b> 24 Loyang Crescent, Loyang Industrial Estate. Singapore 508987 Tel : 6291 2396 , Fax: 6292 6737 Attention: Mr. Pauland Ang		
<b>Your References</b>	<b>Term</b>	<b>Date</b>
	COD	09/12/2019
<b>Item</b>	<b>Description</b>	<b>Quantity</b>
	Supply & Install Scorpion Model 10,000 Truck Mounted Attenuator for Truck XE 3025Z. ( S/N: 10021)	
1	P/N: 10400A Module A Energy Absorber	01
2	Tail Lamp with bracket ( Left )	01
3	Full Labour Cost , dismantling, removing, installation, repairing, re-alignment	01

Received the good in good order & condition.  
GOODS SOLD ARE NOT RFUNDABLE.


<b>SIGNATURE, DATE &amp; CO. STAMP</b>


<b>AUTHORISED SIGNATURE</b>

Helen Ooi  
Admin Manager





email 18/12/19 Mr. Boo

**INOPAVE** GROUP PTE LTD  
No: 96, Lorong M, Telok Kurau  
Singapore 425401  
Tel: 65-6284 8551 Fax: 65-6285 8106  
http://www.inopave.com

47

Co. Reg. No. : 200302075 E  
GST Reg. No.: 20-0302075-E

**TAX INVOICE NO.: IN/LI/0305/0582**

<b>GIM TIAN LOGISTICS PTE LTD</b> 24 Loyang Crescent, Loyang Industrial Estate. Singapore 508987 Tel : 6291 2396 , Fax: 6292 6737 Attention: Mr. Ang				
<b>Your Reference</b>		<b>Term</b>	<b>Date</b>	
-		COD	09/12/2019	
<b>Item</b>	<b>Description</b>	<b>Qty</b>	<b>Unit Prices (SGD)</b>	<b>Amount (SGD)</b>
	Supply & Install Scorpion Model 10,000 Truck Mounted Attenuator for Truck XE 3025Z. ( S/N: 10021)			
1	P/N: 10400A Module A Energy Absorber	01	9,500.00	9,500.00
2	Tail Lamp with bracket ( Left )	01	200.00	200.00
3	Full Labour Cost , dismantling, removing, installation, repairing, re-alignment	01	1,200.00	1,200.00

**SGD: Eleven Thousand, Six Hundred & Sixty-Three Only.**

Sub-Total : \$10,900.00  
7% GST : \$ 763.00  
**Total : \$ 11,663.00**

**E. & O.E**

ANY COMPLAINTSON ON THE INVOICE SHOULD BE LODGED WITHIN 7 DAYS.  
INTEREST AT 2% PER MONTH WILL BE CHARGED ON OVERDUE ACCOUNT  
Payment to be made payable to " **INOPAVE GROUP PTE LTD** "

  
**Authorized Signature**

**Louis Chia**  
**Admin Executive**