

WORK ZONES – MEETING MOBILITY AND SAFETY NEEDS



PERTUBUHAN PROFESIONAL
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CAWANGAN JALAN
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THE SPECIFICATION OF DEVICES AT WORK ZONE

Ir HJ WAN ABDUL RAHMAN BIN WAN HASSAN

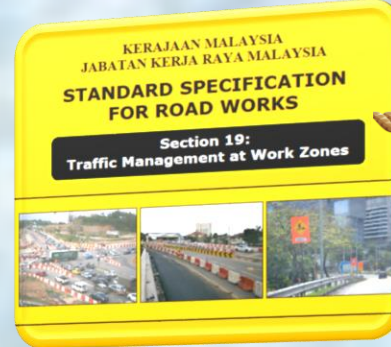
SENIOR SUPERINTENDENT CIVIL ENGINEER



TECHNICAL EXECUTIVE TALK (TEXT 2) :
TRAFFIC MANAGEMENT AT WORK ZONE

SPECIFICATIONS AND STANDARDS

STANDARD
SPECIFICATION
SECTION 19 : TRAFFIC
MANAGEMENT AT
WORK ZONES



GENERAL
THE EFFECTIVE IMPLEMENTATION OF TRAFFIC MANAGEMENT AT WORK ZONES.
TEMPORARY SIGNAGE
TEMPORARY ROAD MARKING
TRAFFIC MANAGEMENT EQUIPMENT
PLACEMENT AND REMOVAL OF TRAFFIC CONTROL DEVICES
MAINTENANCE OF TRAFFIC CONTROL ZONES

WORK ZONE CONTROL

THE NEED FOR TRAFFIC MANAGEMENT AT WORK ZONES
THE PRINCIPLES OF TRAFFIC MANAGEMENT AT WORK ZONES
STRATEGIES FOR EFFECTIVE IMPLEMENTATION OF TRAFFIC MANAGEMENT AT WORK ZONES
PLANNING OF TRAFFIC MANAGEMENT AT WORK ZONES
DESIGNING TRAFFIC MANAGEMENT AT WORK ZONES
TYPICAL LAYOUTS OF THE TRAFFIC MANAGEMENT PLAN
TAKING OFF QUANTITIES
PLACEMENT AND REMOVAL OF TRAFFIC CONTROL DEVICES
MAINTENANCE OF TRAFFIC CONTROL ZONES
REPORTS



MANUAL ON TRAFFIC
CONTROL DEVICES
TEMPORARY SIGNS
AND WORK ZONE CONTROL
PART 1

MANUAL ON TRAFFIC
CONTROL DEVICES
TEMPORARY SIGNS
AND WORK ZONE CONTROL
PART 2



TEMPORARY TRAFFIC CONTROL DEVICES
GENERAL
CATEGORY OF TRAFFIC CONTROL DEVICES.
Temporary signages
Temporary Road marking
Temporary management equipment.

TEMPORARY SIGNAGES

TEMPORARY WARNING SIGNS :

Used to warn the road users about any changes or danger before and during travelling through the work zone

TEMPORARY INFORMATIVE

SIGNS : Used to inform road users about road closure information or diversion ahead

TEMPORARY DIRECTIONAL

SIGNS : Used to direct traffic to designated alternative road during road closure or diversion to guide the traffic back to the intended destination

SIGN PLATE

Rectangular shape with rounded corners. Made of aluminium composite of min. thickness of 4mm and aluminium thickness of 0.2mm for both sides.

FRAME

25mm x 25mm x 1.2mm Thickness
Square Hollow Mild Steel painted in black color

POST

75mm Ø x 1.2mm thickness
Furniture Tube painted in black color

SIGN FACE

Background of the temporary sign shall be of the "Wide Angle Prismatic" Fluorescent Orange colour.

The background for any inserts/symbols within the temporary sign shall be of the "High Intensity Prismatic" non-fluorescent colors.

INSTALLATION

- Must determine the location of signages to be installed
- Shall **be installed starting at Zone A** (Advance Warning Area) subject to category of traffic at the **required spacing** as per approved.
- If the installation requires lane closure, a flagman shall be placed before the installation area to warn the traffic
- The sign face shall be free from dirt or unwanted marks (e.g. sticker).



TEMPORARY ROAD MARKING

Intermittent lines,
letters, arrows, symbols
or figures

Yellow in colour (follow
X,Y chromaticity
coordinates)

Apply to dimensions
and locations shown in
the TMP

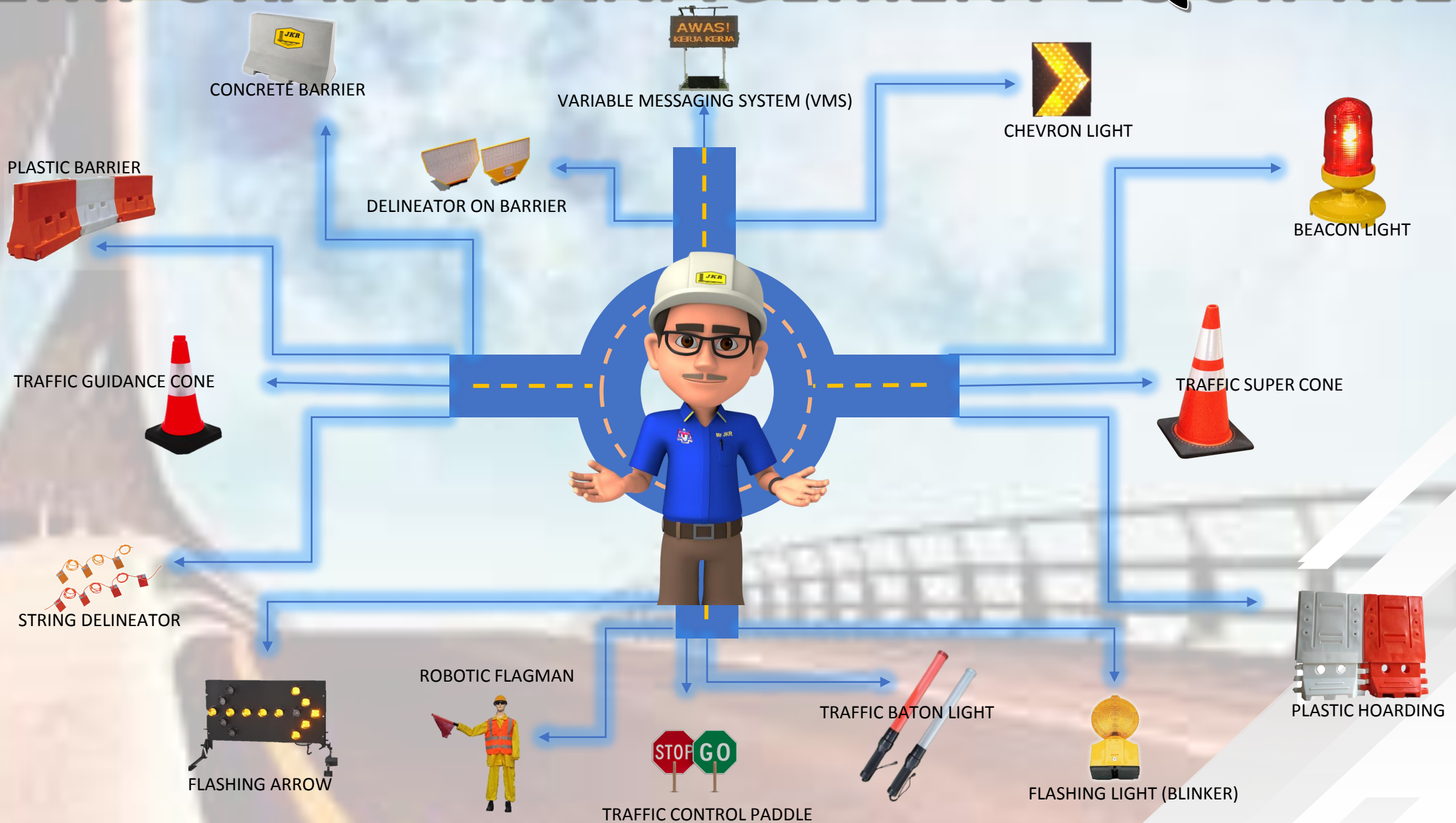


Paint – Temporary work
< 30 days comply with
MS 164. Wet thickness
315 – 400 microns

Thermoplastic –
Temporary work > 30
days and road with high
traffic density

Not less than 2mm thick

TEMPORARY MANAGEMENT EQUIPMENT



TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- Weight shall be **3.0kg** with **440mm x 440mm** rubber base
- Height **750mm**
- Comes with **white HIP reflective strip**

white high intensity
prismatic retro
reflective sheeting

INSTALLATION

- Cones may be placed either by a Traffic Controller on foot or from a moving vehicle. When working from a vehicle, the truck shall be equipped with a suitable worker platform and railing
- On high-speed roadways, a shadow vehicle with suitable warning device shall be used to protect the workers who are working from the back of truck



APPLICATION REQUIREMENT

- Shall be used at **Buffer Area, Work Area and Termination Area** during temporary lane closure or road diversion of **less than 24 hours**
- Shall be **5m spacing** or as indicated in the approved TMP

TRAFFIC GUIDANCE CONE

TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- Material - LDPE
- Weight - 5.0 kg
- Weighted down using 530mm x 530mm rubber base.
- Height – 1000mm



white high intensity
prismatic retro
reflective sheeting

APPLICATION

Recommended to be used for tapering at Transition area.

Shall be at 5m spacing or as indicated in TMP

TRAFFIC SUPER CONE

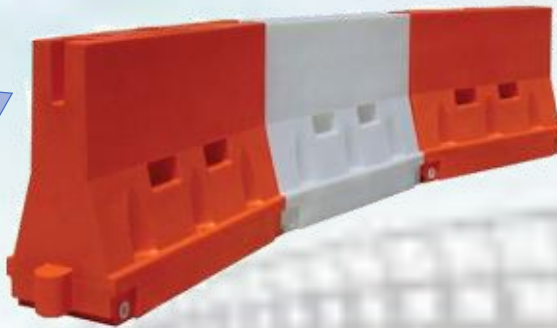
TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- Dimension of Plastic Barrier shall be **1000mm (L) x 800mm (H) x 500 (W)**
- alternate red and white colour
- Dry weight of **10.0kg**
- Must be **filled with water** once installed

INSTALLATION

- Shall be installed **interlocked**.
- If installation requires lane closure, a flagman shall be placed before the installation area to warn the traffic



PLASTIC BARRIER

APPLICATION REQUIREMENT

- To be used at **excavation work with depth less than 1m** from road level, arranged continuously in **alternating colors** and **interlocked**
- Plastic barriers shall be installed at road shoulder where construction work is going on.

TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- shall be of grade min **G25** by using steel mold or F3 Grade Finishes
- shall come in 1.0m segment with the dimension of **1000mm (L) x 800mm (H) x 500mm (W)**
- Shall installed in alternate **yellow and black** colour

INSTALLATION

- Shall be installed **interlocked at all times.**
- If the installation requires lane closure, a flagman shall be placed before the installation area to warn the traffic.
- Concrete barrier shall be installed or shifted by using a proper lorry crane, mobile crane, backhoe or excavator that have been placed within the lane closure



CONCRETE BARRIER

APPLICATION REQUIREMENT

- Shall be used for **long terms (more than 3 months) lane closure or road diversion.**
- Replacing an existing permanent safety feature that has been removed (e.g: guardrails)
- Located close to rigid objects such as sheet piling.
- To be used at **excavation work with depth more than 1m from road level**, arranged continuously and **interlocked.**
- shall be arranged in alternating colors of **black and yellow**

TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

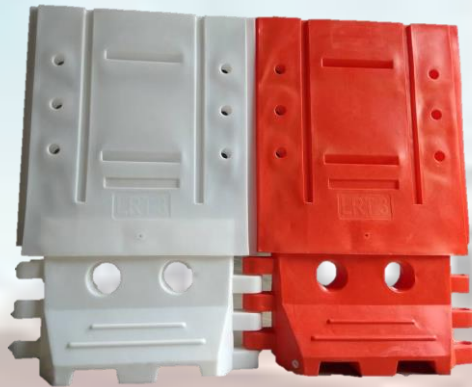
- Shall be minimum **1200mm (L) x 1140mm (H) x 60mm (W)**
- Base material shall be of UV light stabilized linear high density polyethylene.
- Shall be arranged in alternating colors of **red and white and interlocked.**
- Bottom part of the plastic hoarding shall be **slotted at least 150mm into the plastic barrier or concrete barrier**

APPLICATION REQUIREMENT

- Shall be placed at work zones where the **view of activities is to be blocked** to prevent distraction.
- Shall be **tied down** away from traffic to prevent overturning during storms.
- Reinforcement at the back of plastic hoardings shall be provided to prevent misalignment.

INSTALLATION

- Only **necessary if there are any heavy machineries or activities** within the construction area.
- Plastic hoarding must be slotted in properly into the plastic barrier or concrete barrier to avoid slanting or fall



PLASTIC HOARDING

TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- Shall have square reflective plates
- **75mm x 75mm** fluorescent orange retro- reflective sheeting is tied to the string at **1000mm c/c**.
- The length of the string shall be **50m** long.
- Delineator string shall be mounted to wooden post (25mm x 25mm) with 3m spacing interval

APPLICATION REQUIREMENT

- Shall be installed **along Work Zone** next to a road.
- Delineator string with missing reflective plate (s) shall be removed and immediately replaced with a new delineator string
- Shall be install with minimum **1.0m height from the ground**

STRING DELINEATOR



TEMPORARY MANAGEMENT EQUIPMENT



TEMPORARY MANAGEMENT EQUIPMENT



TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- Minimum lense diameter 200 mm.
- Shall emit **amber coloured** light.
- Shall be visible from a **minimum distance of 900m** to warn the road users

APPLICATION REQUIREMENT

Shall be **installed on traffic guidance cones, barriers or hoardings every 30m c/c at straight and 10m c/c at taper or curve** to allow drivers enough time to alter their driving patterns



FLASHING LIGHT (BLINKER)

TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- 4 pcs super bright LED
- 1.2V 1500mAH Ni-MH rechargeable battery
- 0.4W solar panel (optional)
- Post for beacon light shall be 48mm
- Base of beacon light shall use square hollow mild steel
- Amber colour and able to work minimum of 12 hours



BEACON LIGHT

APPLICATION REQUIREMENT

- Preparation of site must be done before the placement of beacon light and determination of the location
- Can be installed at any location that require extra attention from the road user

TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- Flashing arrow shall be able to work for a **minimum of 12 hours or through the night**.
- Each flashing arrow shall use LED strip.
- Flashing arrows shall be visible from a minimum **distance of not less than 1000m** to warn the road users.
- Max **height** of adjustable flashing arrow shall be **2500mm from the existing ground level** and shall be visible to the traffic.



FLASHING ARROW

APPLICATION REQUIREMENT

Flashing arrows shall be **installed at Transition Zones for tapering** (with 3 nos of arrow signboard and can be combined with chevron light) during night lane closure or other locations as required by the S.O

INSTALLATION

- Arrangement of flashing arrow at Transition Zone shall follow the typical drawing for lane closure.
- The arrow flasher light must not be obstructed by any object

TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- Chevron lights shall be able to work for a minimum of 12 hours or through the night.
- Shall be **1820mm (L) x 1220mm (H)**

APPLICATION REQUIREMENT

Chevron lights shall be **installed at Transition Zones for tapering** and can be combined with flashing arrow) during night lane closure or at other locations as required by the S.O

INSTALLATION

- Arrangement of chevron lights (combined with flashing arrow) at taper shall follow the typical drawing for lane closure.
- The chevron light must not be obstructed by any object



CHEVRON LIGHT

TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- PVMS shall be **solar powered with spare power supply to ensure 24 hours operation.**
- shall have a black background with **amber colored LEDs.**
- There shall be at least 4 pcs of LED bulbs per pixel of the board.
- PVMS board shall be **able to display graphics and letters.**
- PVMS board shall have a minimum display dimension of **2000mm (W) x 1200mm (H)**

APPLICATION REQUIREMENT

- Shall ensure that the PVMS board is installed at the appropriate position and visible to the traffic.
- PVMS to be operated at all times during road closure or diversion and necessary backup power supply to be provided to ensure continuous operation.

INSTALLATION

- Usually the **location to be installed shall be before approaching the construction work zone.**
- The VMS must not be obstructed by any object



VARIABLE MESSAGING SYSTEM (VMS)

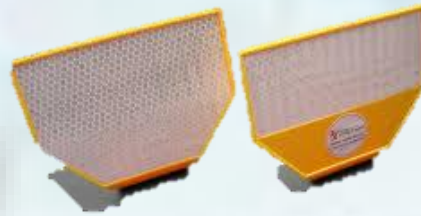
TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- Shall be from HDPE materials.
- Size of the reflective plate shall be **115mm (H) x 50mm (W)** with **orange** HIP reflective sheeting

APPLICATION REQUIREMENT

- Shall be installed immediately after barriers have been set up for the road diversion scheme.
- Shall be **installed at the centre of every red color plastic barrier** and at the centre of every **black moveable concrete barrier**.



DELINEATOR ON BARRIER



TEMPORARY MANAGEMENT EQUIPMENT

- Robotic flagman shall be able to work for a duration of 24 hours operation.
- Must be visible and equipped complete with flagman uniform.
- The location to be installed is immediately within the Transition Area.
- Robotic flagman shall be deployed for both the short term and long term at work area



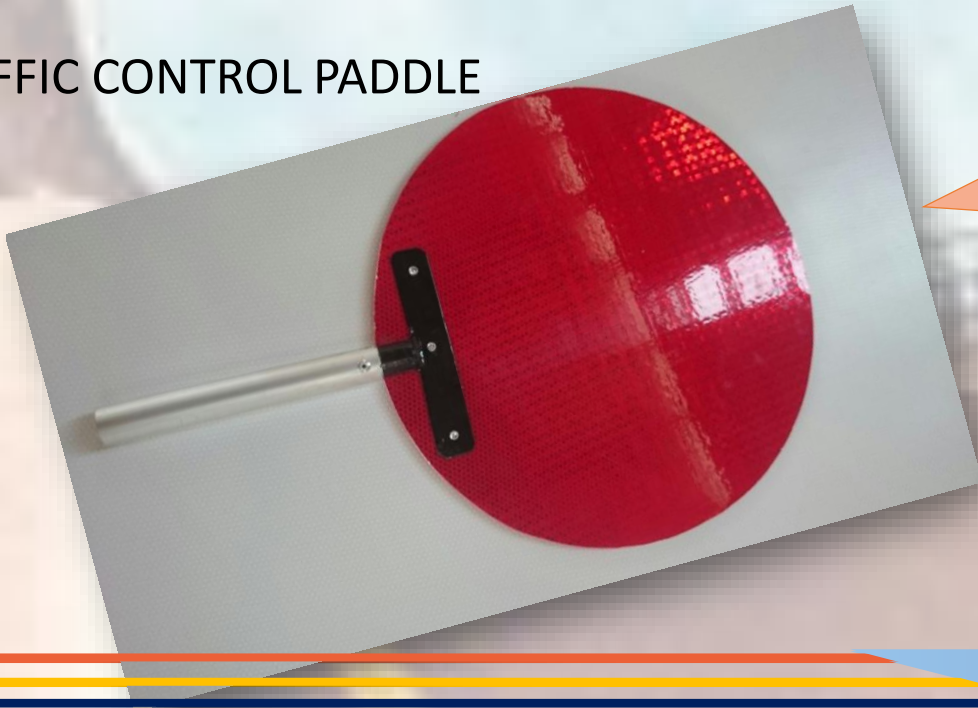
ROBOTIC FLAGMAN

TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- Traffic control paddle shall be **round in shape and 350mm diameter**.
- **Red fluorescent prismatic retro-reflective sheet** shall be used on **both sides** of the paddle

TRAFFIC CONTROL PADDLE



APPLICATION REQUIREMENT

- Traffic control paddle shall be **used by flagman to control traffic during daytime** operations and method of using is to be same with flagging method.

TEMPORARY MANAGEMENT EQUIPMENT

SPECIFICATION

- Traffic baton light shall be minimum 40mm diameter and 260mm length.
- Shall be **red** in colour and able to work for minimum of 12 hours throughout the night.
- Shall be visible for a minimum distance of 200m

APPLICATION REQUIREMENT

- Traffic baton light shall be used by flagman to control traffic during night time operations.
- Method of using traffic baton light to be the same as flagging method of 19.5.14 in the specification



TRAFFIC BATON LIGHT

TRAFFIC MANAGEMENT DEPLOYMENT TEAM(TMDT)

- Lorry shall be provided by the Contractor for setting up and maintaining traffic control devices for day and night operations.
- The lorry shall be a minimum 1 tonne lorry with cargo hood and grill. The lorry shall be white in colour

EQUIPMENT IN LORRY

- LED arrow light shall be mounted on TMDT lorry rooftop with collapsible holder to secure the arrow light board during operations.
- Reflective yellow and red stripes with 150mm width on both sides and rear of the lorry.
- Project sticker with package location, hotline number and contractor logo.
- Digital video camera (DVR) to be fixed on the lorry.
- 1 unit of strobe light (amber coloured) fixed on the lorry rooftop.

ERT lorry shall be provided by the Contractor to the Traffic ERT for patrolling and attending to emergency needs and situations for day and night operations.

The response time to reach affected area and initiate necessary action shall not be more than 30 minutes.

ERT lorry vehicle is strictly for the use of ERT personnel only and its use to ferry workers is strictly prohibited



EMERGENCY RESPONSE TEAM

The Contractor shall provide the following ERT equipment which shall either be in the ERT lorry at all times or properly stored away and ready to be moved and used at any time, as and when required:

1. Two walkie talkies
2. Two baton lights
3. Two battery powered torch lights
4. Two traffic control paddles
5. Ten traffic super cones
6. Three A-shapes signboards
7. One first aid kit
8. One car battery jumper
9. One toolbox

10. One set towing cable
11. One 9kg ABC fire extinguisher
12. Oil absorbent
13. Two flat head scoops
14. Two brooms
15. Two bags of 25kg cold mix asphalt
16. One water pump with accessories
17. Ten blinkers
18. One 24 inch chainsaw.

THANK YOU



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