



<b>Standard Name:</b>	LDV - Safety Features and Specifications	<b>Standard No:</b>	STD-EN-FRCS-01
<b>Originator:</b>	Asset Management Engineer	<b>Issue No:</b>	03
<b>Distribution:</b>	All Employees	<b>Effective Date:</b>	01/06/2020
<b>Next Review Date:</b>	31/05/2022	<b>Related Policy/ Procedure:</b>	PO-SD-ECOHS-01

## 1.0 INTRODUCTION

To eliminate or minimize the risk of fatalities, injuries and incidents arising from the use of light vehicles in surface operations.

In case of conflict with requirements of any other Debswana documents or standards, the following hierarchy will apply:

**1.1** Debswana ECOHS Policy

**1.2** Debswana Fatal Risk Control Standards and Specifications

It is important that when implementing this requirement cognizance of and compliance with the relevant legal requirements of Botswana are considered.

## 2.0 SCOPE

This Specification applies to all light vehicles used for work-related activities and for transporting people and light loads. Examples of light vehicles covered by this Standard are passenger cars, four-wheel drives (including all-wheel drives), sports utility vehicles (SUVs), pick-ups (utilities, bakkies) and mini-buses.

This Specification applies to all Debswana – OLDM managed businesses and operations, including contractors and visitors when involved in controlled activities.

Light vehicles may include the following categories of vehicles being used for work-related activities:

**2.1** Debswana OLDM owned or leased vehicles

**2.2** Hire vehicles

**2.3** Contractor or supplier vehicles operating on company property

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APPROVAL	Senior Engineering Manager	Lefoko Sethoko	<i>[Signature]</i>	01/06/2020



### 3.0 OBJECTIVES

The purpose of this document is to provide guidance and clarity to enable sites to implement the requirements of the Light Vehicles Fatal Risk Control Guidelines.

This should assist sites to align with each other and adopt common solutions regards to meeting the requirements.

The use of motorcycles (two wheeled self-propelled vehicle) for work related activities should not be permitted due to the high risks associated with motorcycle travel.

An employee could use his motorcycle to commute to work, but not for a call-out or company trips outside OLDM operated sites as this is deemed for work purposes

### 4.0 DEFINITIONS

- 4.1 Controlled Activities:** Those are activities that Debswana OLDM has the authority to determine how to manage the operation. They do not include monitored or uncontrolled activities.
- 4.2 Monitored Activities:** Those are activities that Debswana OLDM can exercise some influence but does not have the authority to determine how they should be managed e.g. supplier transporting goods to site; contractor transporting personnel off site.
- 4.3 Uncontrolled Activities:** Those are activities that Debswana OLDM has no influence and does not supervise safety performance e.g. services provided by public Companies; activities performed at suppliers works.
- 4.4 Work-related Activity:** The “work environment” is defined as the establishment and other locations where one or more employees are working or are present as a condition of their employment.

### 5.0 RESPONSIBILITY

- 5.1 Senior Engineering Manager**  
To approve and authorize this procedure
- 5.2 Senior Health & Environment Manager**  
To provide resources aimed at conformance audits and technical/competency training & support

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- 5.3 Asset Management Engineer – Movables to review  
To implement the specification
- 5.4 Section Managers  
To conform to the specification

## 6.0 SPECIFICATIONS & REQUIREMENTS

Application of these Debswana OLDM Specifications is mandatory. Any deviation from the specifications set in this document should be formally approved following an exemption procedure.

The exemption procedure comprises the following steps

- 5.0.1 Documented and detailed description of the implementation difficulties
- 5.0.2 Documented and detailed risk assessment of the situation under proposed alternative control measures
- 5.0.3 Documented formal approval from the SHE Manager, Engineering Manager and the General Manager that the level of risk as a result of the alternative control measures is understood, tolerable by Debswana OLDM and in line with the vision of Zero Harm.

## 6.1 CATEGORISATION

### 6.1.1 Category A: Vehicles with access to the mine/site car park only.

These vehicles can be contractors, company pool or executive vehicles and suppliers vehicles, or vehicles provided by Debswana with the only purpose of transporting people from their home to the work establishment (non work-related activities). This does not include private vehicles.

It also includes contractor or supplier vehicles driving on site to collect or drop off passengers or cargo on an infrequent basis and not interacting with the site operations.

### 6.1.2 Category B: Vehicles (third party or Debswana supplied) that access operational areas (plant/workshop) but do not interact at any time with heavy mobile equipment (HME).

Heavy mobile equipment is defined to have tire rim size larger than 25in. The reason for specifying the rim size is that operators of equipment/vehicles with larger than 25 inch rim size have restricted visibility when interacting with light vehicles.

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These vehicles may interact with other equipment/vehicles that have a tire rim size smaller than 25 inches (size of rim for articulated dump trucks).

#### **6.1.3 Category C: Vehicles that interact with Heavy Mobile Equipment**

Operational areas include roadways inside open pits, loading areas, dump areas, tip points, access to HME workshops, tailing dump & slurry dams.

Note:

**6.1.3.1** Vehicles being used in work-related activities off-site shall be classified to Categories A, B and C according to the areas being accessed.

**6.1.3.2** No vehicle may be allowed to access areas beyond its classification

**6.1.3.3** Every Vehicle in Category C shall have an identity marking shown in Appendix B

### **6.2 PLANT AND EQUIPMENT REQUIREMENTS**

#### **Minimum safety features**

Light vehicles shall have the following minimum safety features:

- Suitable seat belts for all occupants
- Roll-over protection for all vehicles
- Cargo barriers and load restraints
- Driver-side air bag.

#### **6.2.1 Suitable Seat belts for all occupants**

Category A	Category B	Category C
Mandatory	Mandatory	Mandatory

People shall only travel in dedicated seats with seat belts.

A three point safety belt system for each occupant shall be fitted. Lap seat belts can be used in situations where three point safety belts are not practicable. Seat belts shall conform to SAE J140. This applies to forward and rear facing seats.

Side facing seats shall not be allowed because no effective neck support can be provided to the person in the event of a collision.

All seats shall be equipped with head restraints.

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### 6.2.2 Roll-over protection for all vehicles

Category A	Category B	Category C
Risk Assessment for additional ROPS	Risk Assessment for additional ROPS	Additional ROPS is Mandatory

#### 6.2.2.1 Category A and B

The requirement for additional ROPS for Category A and B vehicles is to be established based on specific risk assessment. Consideration shall be given to conditions such as off-road operation, frequent driving on badly maintained or dirt roads, steep and/or winding roads, high centre of gravity (e.g. pick-up trucks, light trucks used to transport heavy equipment), or generally accident prone routes. Additional ROPS shall be mandatory for any company owned vehicle that is frequently exposed to any of the above mentioned conditions. It is not intended that additional ROPS would be applied to light vehicles other than light commercial vehicles such as pick-up trucks, minibuses and light trucks. This then implies that sedan vehicles shall not be employed where and when any of the above risk factors are prevalent.

#### 6.2.2.2 Category C

Additional ROPS shall be mandatory for Category C vehicles (whether company owned or not), motivated by the fact that operational areas which include interaction with EMV's will mostly imply risk factors such as dirt roads, steep slopes, possible badly maintained roads, or off-road usage, etc. The additional ROPS shall be designed, tested and manufactured according to the Anglo American Specification AA Specification 264073. ([http://www.angletechnical.co.za/AA\\_SPEC\\_1.html](http://www.angletechnical.co.za/AA_SPEC_1.html)). The Specification differentiates between two tiers of additional ROPS, namely Standard ROPS and Heavy Duty ROPS. The decision of which tier of additional ROPS shall be required for Category C vehicles, as well as Category A and B vehicles determined to require additional ROPS, shall be based on a specific risk assessment.

##### 6.2.2.2.1 Standard ROPS Design

For normal opencast conditions (well maintained haul roads, speed regulations, berms etc.), the additional Standard ROPS shall be designed and tested according to the requirements of AA Specification 264073, which invokes the international standard

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ISO 3471 or equivalent. This standard is not applicable to light vehicles but is adapted for this purpose in the specification.

#### **6.2.2.2.2 Heavy-duty ROPS Design**

In cases where the risks of accidents involving multiple roll-overs are high, additional ROPS structures that provide higher levels of protection than achieved by ISO 3471 standard shall be used. Examples of these high risk situations include mountain passes, long distance travel on unpaved or poorly maintained off-site roads. The heavy duty ROPS must be designed and tested as prescribed in AA SPEC 264073.

#### **6.2.2.2.3 FOPS for Category C vehicles**

Although the FRCG does not specifically address the requirement for Falling Object Protection Structures (FOPS), it is required that a site based risk assessment shall also be done for Category C vehicles to determine whether FOPS must be fitted. The FOPS shall be designed in accordance to the Anglo American Specification AA SPEC 264073.

#### **6.2.3 Cargo barriers and load restraints**

For all vehicles designed for carrying loads (other than passengers) or that are unable to have cargo separated from the vehicle's occupant carrying space. Refer to PR-EN-21

#### **6.2.4 Driver-side air bag**

Category A	Category B	Category C
Highly recommended	Mandatory	Mandatory

Newly purchased (2020 and after) Category A vehicles owned and operated by Debswana OLDM shall conform to 5 STAR NCAP requirements. For current vehicles owned and operated by Debswana OLDM a driver side airbag will suffice. If such a vehicle does not have a driver side airbag, a retro-fit airbag (see comments below) may be fitted.

It is the responsibility of line managers to demonstrate via a documented risk assessment vehicles being used in the pursuit of Debswana business are safe to be used without airbags. This risk assessment shall take into consideration the nature and frequency of the journeys being taken by the employee for business purposes.

Category B and Category C light vehicles including contractor vehicles must comply with the requirement of driver side airbags. Retrofit airbags that have been tested

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according to ISO 12097 will also be accepted on vehicles that were purchased prior to March 2008. Any vehicles purchased after March 2010 must be equipped with an OEM supplied driver side airbag.

#### **Light Vehicle interaction with heavy mobile equipment and/or plant**

Light vehicles that interact with heavy mobile equipment and/or plant shall have:

- Systems that enable positive communication with the equipment and/or plant
- High-visibility flag (e.g. a whip flag or buggy whip)
- Revolving light
- High-visibility colour
- Reflective taping

#### **6.2.5 Positive 2 way base/mobile radio communication with the equipment and/or plant**

Category A	Category B	Category C
Not Applicable	Not applicable	Mandatory

Two way base/mobile communication radios hands -free are recommended. Handheld radios with a built in microphone will be accepted so long as a radio holder is installed inside the vehicle and the radio is kept in the holder at all times (i.e. not handheld). A risk assessment must be performed to determine the best suitable position for the installation.

#### **6.2.6 High visibility flags e.g. a whip flag or buggy whip**

Category A	Category B	Category C
Not Applicable	Not Applicable	Mandatory

A buggy whip shall be fitted to either the front or back of the vehicle so that the flag is at least of 3metres from the ground level. The height of the flag must be such that operators of haul trucks can clearly see the flag from inside the haul truck cab when the light vehicle is 3m from the truck.

Specifications:

- The buggy whip shaft shall be fitted with a standard reflective sleeve.
- The fitment of a high visibility LED night light to the buggy whip is optional.
- The flag shall be triangular in shape with minimum dimensions of 300mm x 250mm.
- The main flag colour shall be Red Day-Glo.

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- The reflective sleeve shall be at least 1m long and made from Yellow Day-Glo.
- The buggy whip shaft shall be made from fiberglass.

#### 6.2.7 Revolving light

Category A	Category B	Category C
Not Applicable	Mandatory	Mandatory

Revolving lights shall be fitted to the highest visible point on the vehicle structure. It is recommended that the revolving light is amber for maximum visibility. A 12/24 volt, 3.0 to 4.0 amps and 37/70 watts SAE Class 2 systems should be used according to vehicle electrical system. The revolving light shall be covered when on public roads.

#### 6.2.8 High visibility colour

Category A	Category B	Category C
Recommended	Mandatory	Mandatory

White is considered to be the most visible colour in uniform lighting conditions.

#### 6.2.9 Reflective taping

Category A	Category B	Category C
Applicable	Mandatory	Mandatory

Fluorescent yellow reflective tape shall be used on the sides of all vehicles. Red tape shall be applied to the rear and white tape to the front of vehicle to increase the visibility of the vehicle, especially at night. Appendix B. Reflective tape shall not be used on Bull bars and tail bars.

#### 6.2.10 Vehicle Identification

Light vehicles operating on site should be fitted with signage allowing for easy and positive vehicle identification from a reasonable distance.

Category A	Category B	Category C
Applicable	Mandatory	Mandatory

Light vehicles shall be required to be fitted with identification signage to ensure that the vehicle (whether driven, stationary or parked) is identifiable from a reasonable distance. Quick and easy identification of the vehicle assists with

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verifying that the vehicle is operating within approved areas and in order that contact can be made with the vehicle operator in emergency situations.

Identification signage must be applied to:

- The sides of the vehicle - to allow for identification of the vehicle from the side by another vehicle operator and/or pedestrian
- The bonnet or hood of the vehicle to allow for identification from above (e.g. from a haul truck) where necessary and
- The rear of the vehicle to allow for identification by another vehicle operator following behind or who has been overtaken.
- ALL CATEGORY C Vehicle an additional signature "C" must be placed at the rear and sides of the vehicle.

Refer to Appendix B for identification signage specifications. For the purposes of this standard the following shall apply;

#### Departments

FINANCE	- F
HUMAN RESOURCES	- HR
ENGINEERING SERVICES	- ES
ORAPA MINE	- OM
DAMTSHAA MINE	- DM
LETLHAKANE MINE	- LM
SAFETY, HEALTH & ENVIRONMENT	- OHSAS
ADMINISTRATION	- AD
BUSINESS SERVICES & TOWNSHIP	- BST
GEOLOGY	- GEO
SURVEY	- SVY
MINERAL RESOURCE MANAGEMENT	- MRM
SECURITY	- SEC
HEALTH SERVICES	- HE

#### Emergency Equipment

Light vehicles should have:

- First aid kit
- Emergency roadside triangles
- Survival or emergency equipment suitable for the operating environment.

#### 6.2.11 First aid kit

Category A	Category B	Category C
Recommended	Mandatory	Mandatory

Refer to PR-SHE-40 for more details regarding First Aid Kits.

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### 6.2.12 Emergency roadside triangles (Two)

Category A	Category B	Category C
Mandatory	Mandatory	Mandatory

Two (02) emergency triangles are required. In the event of a breakdown;

- One (01) triangle shall be placed 10m behind vehicle and
- One (01) triangle shall be placed 10m front of vehicle

Hired vehicles shall also comply with this requirement.

### 6.2.13 Survival or emergency equipment suitable for the operating environment

- This requirement is intended for journeys to remote locations or unusual or long journeys.

Category A	Category B	Category C
Mandatory	Mandatory	Recommended

Typical equipment shall include:

- Fire extinguisher (ABC type, this is the multipurpose dry chemical extinguisher. The ABC type is filled with mono-ammonium phosphate. 1.5kg units are required for cars and a 9kg unit for LDVs).
- Recovery rope – **12mm dia x 6m long x 9,400kg tensile strength** Nylon Double Braid, Lock-stitched splicing and Chafe guarded loops on each end. Appendix C
- Life line
- Life jacket (submersion case)
- Spare wheel
- Car jack
- Drinking water (long journeys to remote locations)
- Basic tool kit

## 6.3 SYSTEM AND PROCEDURAL REQUIREMENTS

### 6.3.1 Vehicle Selection

Vehicle selection shall be based on risk assessment taking account of tasks, application, environment, roll-over protection and rating of sturdiness in the event of a crash.

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Category A	Category B	Category C
Not applicable	Not applicable	Mandatory

The following vehicle matrix must be used when procuring a new vehicle

Requirement	Comments	LDV	Mini-bus	Car
Seatbelts	All occupants 3 point; SAE J140 accredited. No Side facing seats			
ROPS	See ROPS guideline			Not required
FOPS	ISO 3449			Not required
Euro/Aus NCAP rating		≥4	≥3	≥4
Cargo barriers / Load Restraints				
Driver side Airbag	ISO 12097			
High visibility colour (WHITE)	Environment driven			Not required
Emergency roadside triangles	3 off			
First Aid kit				
ABS		Not required		
ABS deactivated			Not required	Not required
Deactivation of cell phone hands-free kits				
Modified side mirror to view blind spot				
Load bin hooks to restrain loads			Not required	Not required
Anti-hi-jack safety windows				
Reversing alarm				Not required
Revolving light		RISK ASSESSMENT	RISK ASSESSMENT	
Chock blocks				Not

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				required
Two way communication radios				
Dip able rear view mirrors				
Highly recommended	Subject to Risk Assessment			Mandatory

The NCAP rating of a vehicle is determined using 4 different crash tests. The damage to dummies inside the vehicle is used to determine a crashworthiness rating.

Euro/Australian NCAP crashworthiness data is available for most cars and LDVs. Further information is available on [www.euroncap.com](http://www.euroncap.com) or [www.ancap.com.au](http://www.ancap.com.au).

### 6.3.2 Formal Inspection

Refer to PR-EN-33.

Application:

Category A	Category B	Category C
Mandatory	Mandatory	Mandatory

### 6.3.3 Seat belts

Seat belts shall be used in all cases by all occupants.

Application:

Category A	Category B	Category C
Mandatory	Mandatory	Mandatory

### 6.3.4 Vehicle safety checks

Refer to PR-EN-33

Application:

Category A	Category B	Category C
Mandatory	Mandatory	Mandatory

### 6.3.5 Light vehicle running lights

Light vehicle running lights (low beam headlamps) shall be wired to auto-switch on immediately when the vehicle is started.

Application:

Category A	Category B	Category C
Recommended	Mandatory	Mandatory

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## 7.0 AMENDMENT HISTORY

Issue No	Effective Date	Date Last Revised	Amendment Details
01	01/03/2016	28/02/201	<ul style="list-style-type: none"> <li>Reviewed as per the standard policy</li> <li>Standard number changed</li> <li>Issue number changed</li> </ul>
02	30/10/2017	29/10/2017	<ul style="list-style-type: none"> <li>Reviewed as per the standard policy</li> <li>Originator and approver names changed</li> <li>Review date and effective date amended</li> <li>Issue number changed</li> </ul>

## 8.0 APPENDIX

### 8.1 Appendix A: Reference Documents

### 8.2 Appendix B: Identification Signage Specifications

### 8.3 Appendix C: Recovery Rope Specification

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## 9.0 RELATED DOCUMENTS

Document no.	Document name	Issue date	Date of next review
PO-SD-ECOHS-01	ECOHS Policy	01/03/2020	28/02/2025

## APPENDIX 1: REFERENCE DOCUMENTS

All Reference Documents are available on the Anglo American Information Portal.

AA SPEC 264072	Guideline: Roll-over Protective Structures and Falling-object Protective Structures for Trackless Vehicles
AA SPEC 264073	Specification: Roll-Over Protective and Falling-Object Protective Structures for Trackless Vehicles
AA AFRBP 000019	Fatigue Management Manual
SAE J2074	The air bag systems in your car – “What the public needs to know”

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## APPENDIX B: IDENTIFICATION SIGNAGE SPECIFICATIONS

### Colour

Recommended colour is black lettering on a white reflective background.

### Layout

In order to provide clear and uncluttered vehicle recognition, the use of corporate logos within the decal is not recommended due to possible disruption to the vehicle identification visibility. Logos, where required, should be separated from the identification signage.

### Size

The nominal decal size should be approximately A3 (420mm x 97mm) with a letter height of 150mm. However, the actual size of the decal will depend on the design of the door and rear panels on the vehicle type to which they are being applied.

Should an A3 size decal be impractical, the decal proportions shown below should be used.

Care should be taken to avoid sharp or complex curves, body panel creases, etc, as high quality reflective material will not conform to these areas.

### Decal Proportions

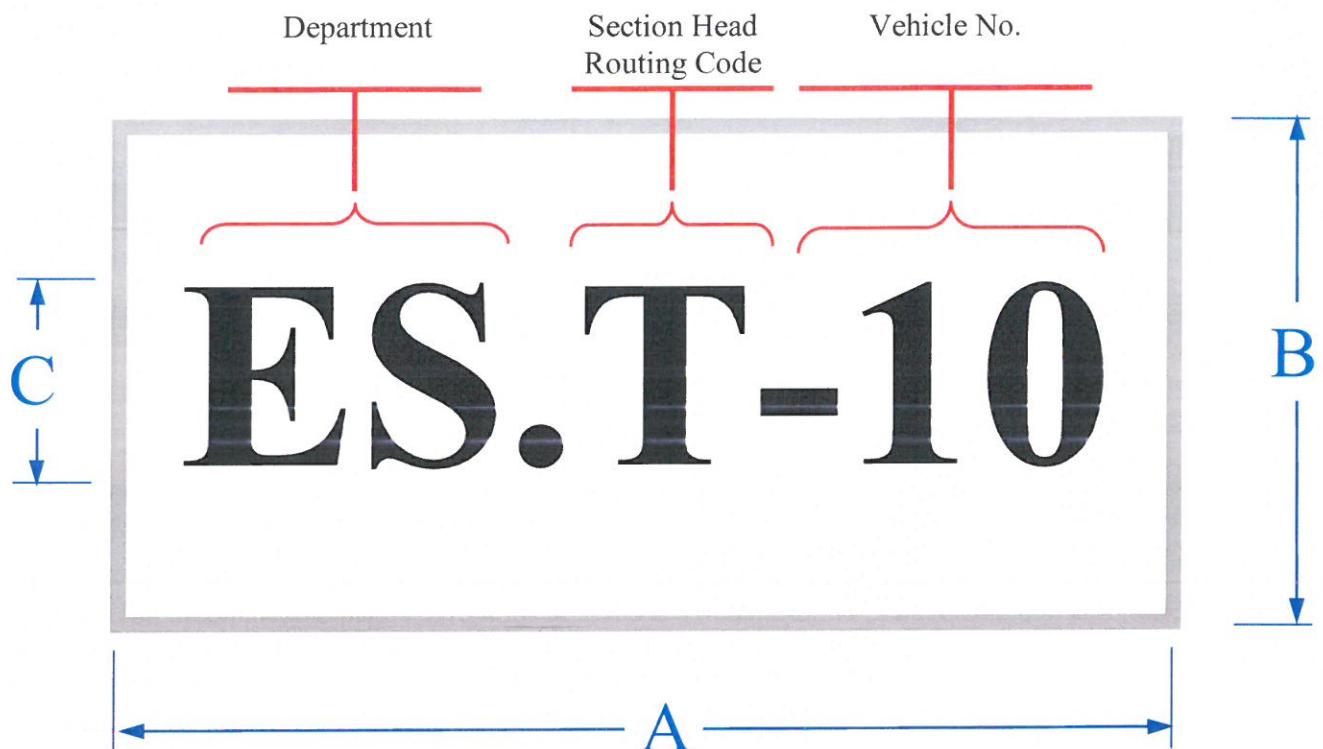
Decal height 'B' should be 55% of Width 'A'.

Font height 'C' should be 50% of Height 'B' minimum.

Font series to be Arial Bold.

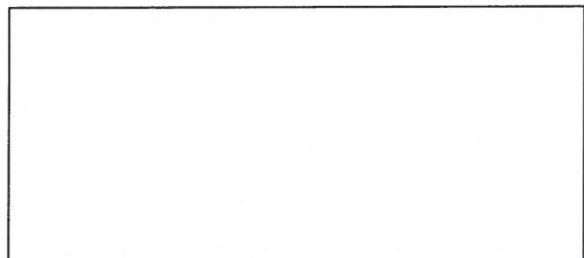
Border width to be 12mm.

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## DEBSWANA LIVERY BRAND DECAL

Side panel decal, Height 350mm, Width 700mm, Logo 165mm



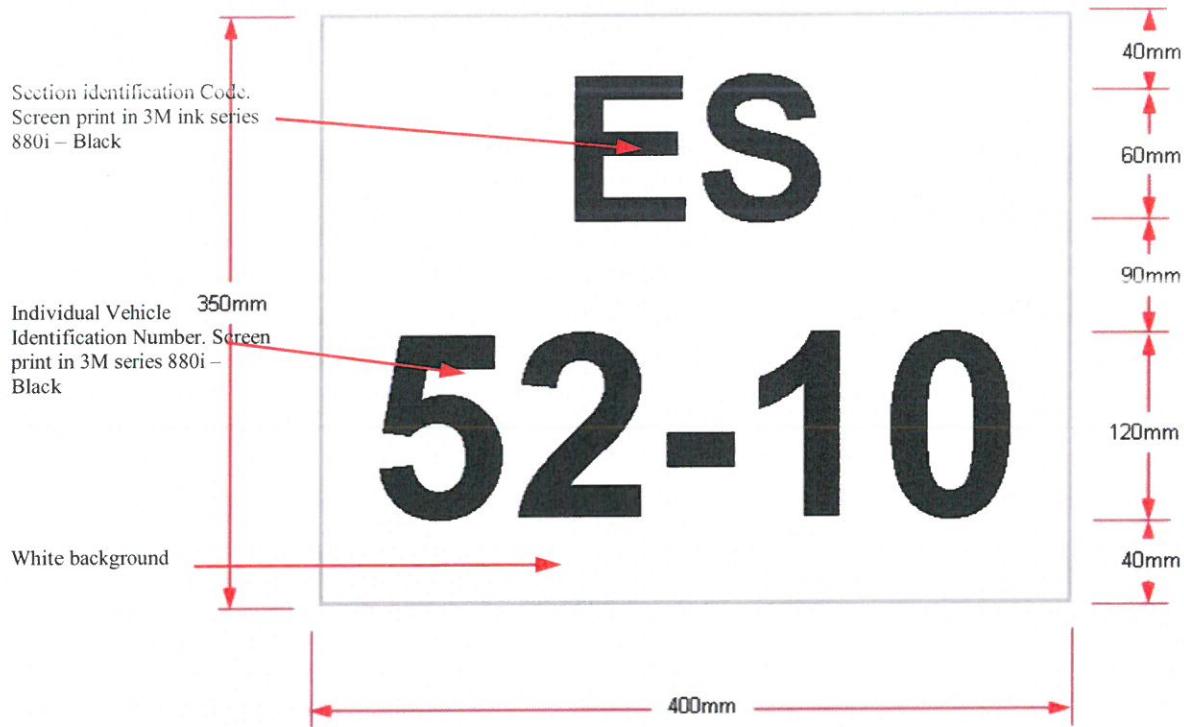
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## DEBSWANA LIVERY VEHICLE IDENTITY DECAL

Rear & Front panel decal, Height 350mm, width 500mm ID Code 60mm letters, ID Number 120mm Numbers Arial Bold font

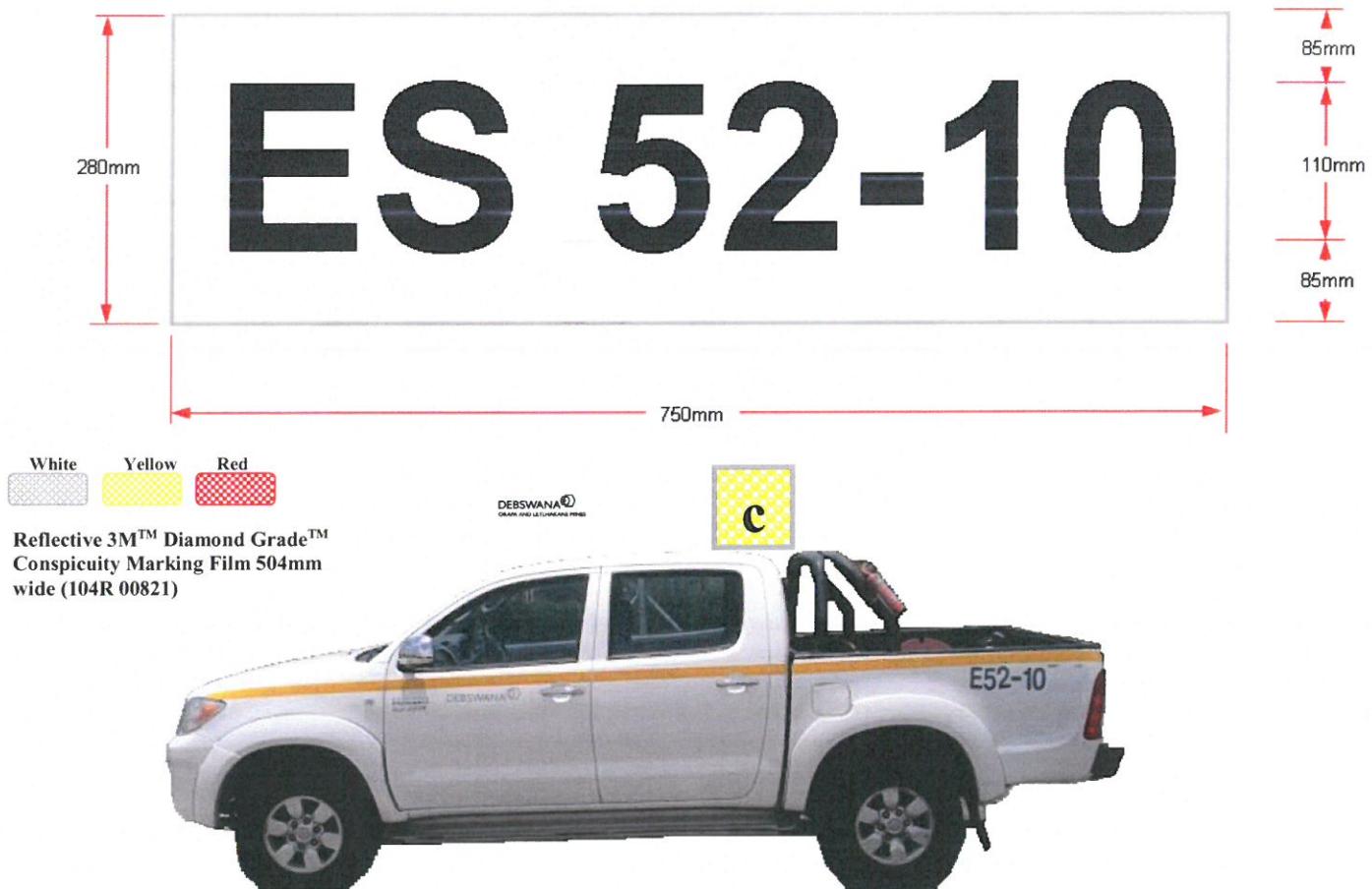


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## DEBSWANA LIVERY VEHICLE IDENTITY DECAL

Side panel decal, Height 280mm, width 750mm ID Code 110mm letters, ID Number 110mm  
Numbers Arial Bold font



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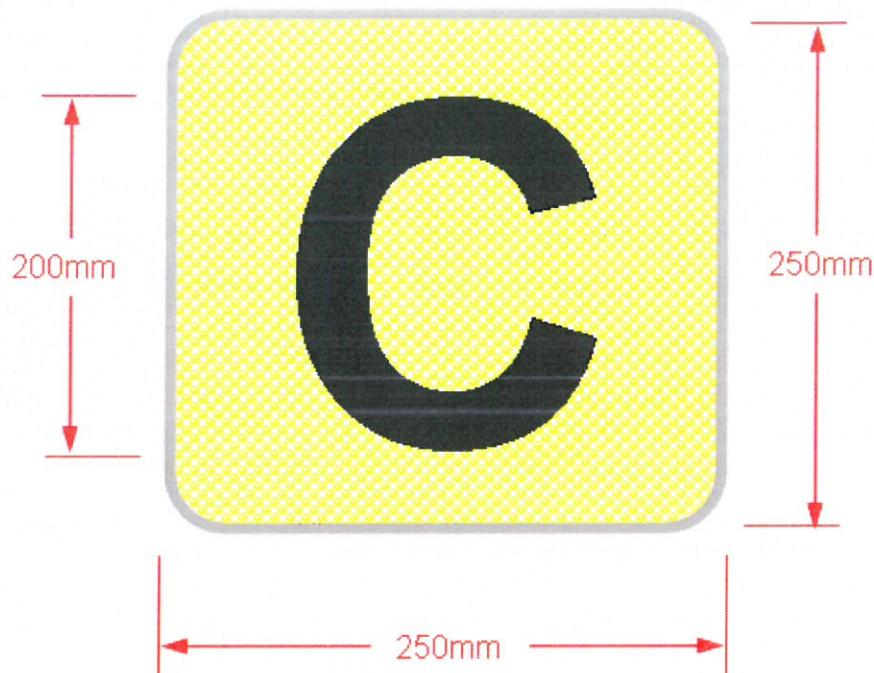
## DEBSWANA LIVERY VEHICLE IDENTITY DECAL

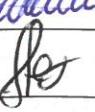
**Rear & Side panel decal.** Height 250mm, width 250mm Category Code "C" 200mm letter, in Arial Bold font



	TITLE	NAME	SIGNATURE	DATE
ORIGINATOR	Asset Management Engineer	Moshe Modiakgotla		01/06/2020
APPROVAL	Senior Engineering Manager	Lefoko Sethoko		01/06/2020

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ORIGINATOR	Asset Management Engineer	Moshe Modiakgotla		01/06/2020
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## Appendix C

### Recovery Rope Specification



Heavy-duty tugging kinetic recovery for LDVs

Size: 12mm dia x 6m long  
 Strength: 9,400kg tensile strength  
 Colour: White  
 Material: Nylon Double Braid, Lock-stitched splicing  
 Loops: 150mm Chafe guarded loops on each end

	TITLE	NAME	SIGNATURE	DATE
ORIGINATOR	Asset Management Engineer	Moshe Modiakgotla		01/06/2020
APPROVAL	Senior Engineering Manager	Lefoko Sethoko		01/06/2020

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