

# CONSTRUCTION SITE TRAFFIC MANAGEMENT GUIDE



This **Construction Site Traffic Management Guide** was approved by the Workplace Safety & Health Sub-committee on behalf of The Singapore Contractors Association Limited (SCAL) on 31 March 2021.

The Workplace Safety & Health Sub-committee, appointed by The Singapore Contractors Association Limited, consists of the following members:

|                | <b>Name</b>             | <b>Capacity</b>                                |
|----------------|-------------------------|--|
| Chairman:      | Mr Lee Kay Chai         | 1st VP, SCAL<br>Lian Soon Construction Pte Ltd |
| Vice Chairman: | Mr Ong Yong Seng        | Shimizu Corporation Ltd                        |
| Vice Chairman: | Mr Loh Yeow Leng        | SC2 Pte Ltd                                    |
| Secretariat:   | Ms Esther Heng          | The Singapore Contractors Association Limited  |
|                | Mr Tan Shu Jun          | The Singapore Contractors Association Limited  |
|                | Mr Yeo Wei How          | The Singapore Contractors Association Limited  |
| Members:       | Mr Chia Keng Wah        | Penta-Ocean Construction Co. Ltd               |
|                | Mr Goh Chye Guan        | Individual Capacity                            |
|                | Mr Henry Ho Koon Tuang  | Sembcorp Specialised Construction Pte Ltd      |
|                | Mr Howard How           | Boustead Projects Ltd                          |
|                | Mr Sukumar Karmaker     | Tiong Aik Construction Pte Ltd                 |
|                | Mr Andrew Khng          | Tiong Seng Contractors Pte Ltd                 |
|                | Mr Roy Khoo             | Kimly Construction Pte Ltd                     |
|                | Mr Lee Yan Shyong       | Sato Kogyo (S) Pte Ltd                         |
|                | Mr Allan Low            | Teambuild Engineering & Construction Pte Ltd   |
|                | Mr S T Moorthy          | Sanchoon Builders Pte Ltd                      |
|                | Mr Don Wilson Paua      | Straits Construction Singapore Pte Ltd         |
|                | Mr Periasamy Muthukumar | Straits Construction Singapore Pte Ltd         |
|                | Mr Rong Jing Xiang      | Woh Hup (Pte) Ltd                              |
|                | Mr Seah Kok Hua         | Samwoh Corporation Pte Ltd                     |
|                | Mr Marcus Ho            | Kimly Construction Pte Ltd                     |

|                   |  |
|-------------------|--|
| Mr Tay Ban Hong   | Lum Chang Building Contractors Pte Ltd |
| Mr Yeo Kim Hock   | Individual capacity                    |
| Mr Jeffrey Yu     | HSL Ground Engineering Pte Ltd         |
| Mr Nick Yeow      | Sanchoon Builders Pte Ltd              |
| Mr Yong Jian Rong | Woh Hup (Pte) Ltd                      |

The Construction Site Traffic Management Guide Working Group, appointed by the Workplace Safety & Health Sub-committee, comprises the following:

|          | <b>Name</b>             | <b>Capacity</b>                           |
|----------|-------------------------|---|
| Leader:  | Mr Seah Kok Hua         | Samwoh Corporation Pte Ltd                |
| Co-Lead: | Mr Henry Ho Koon Tuang  | Sembcorp Specialised Construction Pte Ltd |
| Members: | Mr Sukumar Karmaker     | Tiong Aik Construction Pte Ltd            |
|          | Mr Periasamy Muthukumar | Straits Construction Singapore Pte Ltd    |
|          | Mr Marcus Ho            | Kimly Construction Pte Ltd                |

## Foreword

In construction sites, effective site traffic management will mean reduced risk of traffic-related accidents happening in the work sites. Traffic-related accidents can lead to loss of lives, human injuries and property damage. They may also result in stop work orders leading to loss in productivity and reputation and business opportunities to the contractor. Therefore, it is crucial that contractors provide sufficient attention to site traffic management at their worksites.

This guidebook was prepared by the Construction Site Traffic Management Guide Working Group appointed by the Workplace Safety & Health Sub-committee under The Singapore Contractors Association Limited.

It highlighted some principles that can be adopted to create a safe traffic environment. Factors that can lead to traffic-related safety hazards are discussed. Some examples of traffic-related hazards faced in construction sites and recommended control measures to eliminate or mitigate the safety risks are shared. An update on available innovative tools to manage site traffic-related issues was also provided.

In preparing this guidebook, reference was made to the following publications:

1. WSHC Workplace Safety and Health Guidelines – Workplace Traffic Safety Management (1st rev 2014) and WSHC online resources
2. Traffic Safety at LTA Worksites
3. LTA Good Practices Handbook (2018 ed)
4. Contribution materials from WSH Sub-committee and members of SCAL.

Acknowledgement is made for the use of information from the above publications and contribution from members of SCAL.

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## 1. Scope

This Construction Site Traffic Management Guide is a reference guide for contractors to manage traffic at their construction sites through sharing some good practices from contractors in Singapore.

It acts as a learning and sharing tool for contractors in managing traffic in construction sites.

This guide does not apply to areas outside the construction workplace where the contractor has no management control.

Traffic conditions differ on each site and it is recommended that user compiles his own Traffic Management Plan.

## 2. Definitions

In this guide, the following terms apply:

- a. Traffic would mean either human or vehicular/ machinery flow on site.
- b. Human traffic would mean pedestrian flow on site.
- c. Vehicular/ machinery traffic would mean vehicular/ machinery flow on site.

## 3. Principles in Traffic Safety

Traffic safety in a construction site can be effectively managed by abiding to the following principles, though they are not exhaustive:

- a. Eliminate conflicts between pedestrian and vehicular/ machinery traffic flow.
- b. Forward plan and develop specific traffic management plans.
- c. Update traffic management plan to ensure it stays relevant to site changes.
- d. Ensure that there are direct and continuous pedestrian flow routes.
- e. Ensure vehicular/ machinery movements are guided.
- f. Vehicles/ machinery to be well maintained and fit for use.
- g. Goods on vehicles/ machinery to be well-secured.
- h. Drivers/ operators of vehicles/ machinery to be competently trained on in-house safety and traffic rules.
- i. Actively identify, remove or warn users of blind spots.

## Factors to consider in managing construction site traffic

The principles in traffic safety are affected by many factors.

By effectively managing these factors, we can eliminate or reduce traffic-related safety risks at the workplaces.

These factors are:

|                   |  |
|-------------------|--|
| <b>Management</b> | <p>Management shall:</p> <ul style="list-style-type: none"> <li>i. take ownership and be committed to provide a safe work environment for all stakeholders</li> <li>ii. provide adequate resources and support</li> <li>iii. ensure that a site traffic management system is set up and enforced</li> <li>iv. allow only competent people are tasked to operate vehicle and machinery</li> <li>v. ensure all people are rested adequately and fit to operate vehicle and machinery safely</li> </ul> |
| <b>Man</b>        | <ul style="list-style-type: none"> <li>i. People to take ownership and be committed to a safe work environment when operating vehicle and machinery</li> <li>ii. People do not behave rashly when operating vehicle and machinery</li> <li>iii. All stakeholders do their due responsibilities and exercise caution while carrying out any activities in the work site</li> </ul>  |
| <b>Machine</b>    | <ul style="list-style-type: none"> <li>i. All vehicles and machinery have been properly maintained</li> <li>ii. All vehicles and machinery are being used in accordance with its designed usage</li> </ul>   |
| <b>Medium</b>     | <ul style="list-style-type: none"> <li>i. Operational condition of environment is visible and adequately level without unreasonable obstruction and the environment is well-lit</li> </ul>   |
| <b>Mission</b>    | <ul style="list-style-type: none"> <li>i. Driver/ operator is well-informed of the route of travel and be prepared for the conditions of the route</li> </ul>  |

## 4. Planning

Plan and ensure that **active control measures** are taken to manage the hazards arising from traffic at the workplace.

The planning stage will result in a Traffic Management Plan to be used as reference by all stakeholders in the site:

### a. Traffic Management Plan

A Workplace Traffic Management Plan helps to minimise risks and hazards.

The plan should be prepared by construction manager/ engineer under advice of a WSH Professional and endorsed by Project Manager (Occupier).

An effective Traffic Management Plan shall include the following elements (non-exhaustive):

- i. Workplace Safety and Health (WSH) policy;
- ii. Safety and Health objectives;
- iii. Duties and Responsibilities;
- iv. Traffic Rules and Regulations;
- v. Risk Management;
- vi. Safe Work Procedures;
- vii. Training;
- viii. Emergency Response Plan;
- ix. Incident Investigation.

### b. Areas to consider when preparing Traffic Management Plan:

- i. Adequate setback of workplace from the main road
- ii. Consider expected congestion of workplace – alternative parking areas may need to be considered.
- iii. Consider access to and from the workplace - active traffic control measures may need to be considered.
- iv. Designated travel paths within the workplace – pedestrian and traffic routes.
- v. Designated delivery and loading/ unloading areas.



## 5. Operations

With a Traffic Management Plan in place, control measures need to be implemented to eliminate / reduce the safety risk arising from the hazard identified.

Samples of the Risk Assessment and Management on traffic related hazards is provided in Annex B.

These hazards can also be classified under the following categories:

- a. Management-related issues
- b. Man-related issues
- c. Machine-related issues
- d. Medium-related issues
- e. Mission-related issues

| <b>a. Control Measures to Manage Hazards Arising from Management-related issues</b>  |
|--|
| <b>Ensure all stakeholders have commitment and responsibilities to site traffic management</b>   |
| a. All stakeholders to have the commitment and ownership of taking up the responsibilities to ensure a safe environment in relations to site traffic matter  |
| b. A site traffic management system be set up and enforced.  |
| <b>Ensure workers are allocated dedicated and proper rest areas which are protected from safety hazards.</b>   |
| a. Management needs to allocate dedicated rest areas which are safe for workers to take their rest.  |
| <b>Ensure no conflicts between pedestrian and vehicular/ machinery traffic flow.</b>   |
| a. Movement of pedestrians within the site to be through dedicated walkway which is protected by hard barricades. At junctions with oncoming vehicular/ machinery traffic, warning signage to be placed to warn pedestrians and vehicular/ machinery operator to look each other out and exercise caution. |

## **b. Control Measures to Manage Hazards Arising from Man-related issues**

### **Ensure competency of manpower resource**

- a. Drivers / operators to be competent and possess valid licences / certificates, fit and responsible to carry out their driving safely.
- b. Drivers / operators under medication or any substance which may affect his judgement should not be allowed to operate the vehicle / mobile machinery.
- c. Drivers / operators to be competently trained with valid licences / certificates and assessed.
- d. Drivers / operators to be familiar with the models of vehicles they will be operating.
- e. Drivers / operators to perform safe driving:
  - i. Adhere to the stated speed indicated at site
  - ii. No using hand phone while driving
  - iii. Perform daily vehicle check
  - iv. Secure seat belts (if applicable) before driving/ operating
  - v. Turn on head lights when within the site, and hazard lights when stationary at all times
- f. Workforce/ site personnel to be trained and made aware that they have to:
  - i. Abide by the in-house safety and traffic rules when moving within the site.
  - ii. Putting up the required PPE to ensure their visibility especially when working in the nights.
  - iii. To only rest in the allocated rest areas at the workplace.

### **Define roles and responsibilities for clarity and build ownership in managing traffic related issues at the workplace**

- a. Clearly define the duties and responsibilities of personnel managing and implementing the Traffic Management Plan.
- b. Consider the legal obligations such as WSH Act and its subsidiary regulations when assigning responsibilities and duties.

### **c. Control measures to manage Hazards Arising from Machine-related issues**

#### **Check condition and maintenance of vehicles and machinery**

- a. Ensure vehicles and machinery used are fit for use and regularly serviced by qualified mechanics
- b. Ensure prior operation daily checks by operator / driver using prepared checklist
- c. Ensure vehicle is maintained in accordance to the prepared maintenance schedule

#### **Parking of Vehicle/ Machinery. Driver / Operator to:**

- a. Ensure vehicles and machinery are parked in areas that are authorised and do not pose hazards to other stakeholders in the workplace.
- b. Ensure that vehicles and machinery are safely parked and do not move. On slope areas, wheel chocks to be enforced.

### **d. Control Measures to Manage Hazards Arising from Medium-related issues**

#### **Ensure environment is safe for driving and operating machinery and vehicle**

- a. Vehicles and machinery movement through the site to be done in a safe manner, noting the following conditions:
  - i. Height limit restriction
  - ii. Poor ground condition
  - iii. Blind spot
  - iv. Inadequate lighting
  - v. Poor road condition
  - vi. Visibility must be as clear as reasonably practicable and drive with hands on the steering wheel and eyes on the road.

- b. Blind spots at the workplace to be identified as part of the traffic management plan. Appropriate convex mirrors to be placed at strategic locations to warn all when approaching blind spots to ensure caution is exercised.
- c. Cameras to be installed at appropriate locations of machinery and vehicles to ensure that driver/ operator can see those blind spots during operation.
- d. Movement of machinery/ vehicle to be facilitated with the guidance of banksmen.

### **e. Control Measures to Manage Hazards Arising from Mission-related issues**

#### **Planning and documentation of resource**

- a. Plan and execute movement of vehicle and machinery to and through the work site.
- b. Vehicles and machinery movement through the site to be done in a safe manner.
- c. Submit proper documentation to Safety Dept for verification.
- d. Plan and review Heavy/ Oversized vehicle/ plant/machinery access route.
- e. Traffic controller to be briefed a day in advance of the mobilization schedule. Mobilization into the site to be guided.

#### **Forward planning – Driving over-sized vehicle**

- a. Oversized heavy vehicles which are used to carry large and heavy cargo slow down traffic. They may also affect road structures due to their large size and heavy weight. The movement of these vehicles is therefore regulated for the safety and convenience of other road users.
- b. You need to apply for an oversized vehicle movement (OVM) permit 3 days in advance via LTA.PROMPT for these vehicles.

## 6. Check, Review and Improve

### a. Review effectiveness of implemented measures

- i. Review regularly the adopted traffic management system at the site as the works in the construction worksite progress.
- ii. This is to ensure that the traffic management system remains effective with the changes in the site environment.

### b. Emergency preparedness and response

- i. In any emergency, it is crucial that we can save lives and minimize losses. To meet this aim, it is necessary that an emergency response plan be established and effectively implemented.
- ii. The emergency response plan may include the following:
  - Procedure for raising alarm
  - Procedure for evacuating and rescue of victims
  - Provision of means of rescue and first aid
  - Provision of means of communication with relevant government and response agencies.
  - Provision of an emergency response team, stipulating all their duties and responsibilities.
  - Creation of an emergency contact list.

### c. Incident investigation

- i. Incident investigation is conducted to establish the root causes of an incident.
- ii. This will lead to the recommendation and implementation of necessary preventive measures to create a safer and more productive workplace.
- iii. Typically, the incident investigation is carried out under the following stages:
  - Information gathering
    - Conduct interviews, check incident area and take photographs.
  - Analysis
    - Analyse information and establish root cause(s).
  - Review and implement
    - Review risk assessment
    - Implement changes
  - Communicate all relevant information to workers.

**d. Audit**




- i. Regular audit serves to review the effectiveness of the established site traffic management plan and to identify the gaps observed from the audit. These gaps can then be addressed to improve the effectiveness of the site traffic management plan.
- ii. The audit can be done under the following guide:
  - Monthly on-site inspection by WSH personnel to ensure proper implementation of the proposed mitigation and management measures.
  - WSH Officer to review the monitoring checklist and correction form to ensure appropriate corrective actions are proposed and implementation is undertaken by the specified timescale.
  - Monitoring checklists to be archived in an orderly manner for external auditing.
  - All monitoring checklists to be maintained at the workplace.

**e. Implement improvement solutions following review of findings from the check and review stage.**

- i. Use findings established from the check and review stage to propose improvements to the site traffic management plan.
- ii. The proposed measures shall be planned and documented with follow up to be done by identified responsible person with the targeted implementation timeline.

# 7. Innovative tools in traffic management

Many innovative tools to assist in traffic management are available in the market today. A summary of the available tools is provided in the below Table. Information on these innovative tools is available in the internet.

| Available tools: | Remarks:   |
|------------------|--|
| Safety videos    | Training videos in multi-languages to train team from different nationalities.   |
|                  | <p><a href="#">Driving Safety Videos – Safe Driving Training   DuPont ...</a><br/> <a href="https://www.youtube.com">https://www.youtube.com</a> &gt; watch ▼</p> <p>Aug 15, 2014 - Uploaded by ConsultDSS<br/>           Preview the full "Safe Driving: Take Control" training program here: ...</p>  <p><a href="#">Occupational Driving Safety Programs: The Driver - YouTube</a><br/> <a href="https://www.youtube.com">https://www.youtube.com</a> &gt; watch</p> <p>Oct 31, 2015 - Uploaded by NatiSafetyCouncil<br/>           Occupational Driving <b>Safety</b> Programs: The Driver .... <b>Defensive Driving - Safety Training Video</b> Course ...</p>  <p><a href="#">Driving Safety - Employee Training To Stay Safe on the Road ...</a><br/> <a href="https://www.youtube.com">https://www.youtube.com</a> &gt; watch</p> <p>Mar 20, 2019 - Uploaded by SafetyVideos.com<br/>           Your browser does not currently recognize any of the video formats available. ...<br/> <b>Driving Safety - Employee ...</b></p>  |

|          |   |
|----------|---|
| VR tools | Tools to simulate actual work situations for work team to experience the impact as part of experiential learning. |
|----------|---|



|   |  |
|---|--|
| SCAL Website<br><a href="https://www.scal.com.sg/media-publications">https://www.scal.com.sg/media-publications</a> | Brief and effective reminders on good practices in traffic management. |
|---|--|

**Induction Training on Workplace Safety and Health for Workers**

**Contents:**

- Objective
- Prevent Fall from Height
- Prevent Injuries from Falling Objects Hazards
- Protection Against Protruding Objects
- Prevent Electrocution
- Prevent Being Struck by Machinery
- Prevent Fire at Worksite / Storage and Handling of Hazardous Substances
- Workplace Health & Hygiene
- Traffic Management & Emergency Preparedness
- Personal Protective Equipment (PPEs)



Reflective safety vest

Reflective safety vest filled with LED lights to increase visibility and ensure safety of motorists and workers working in the nights.



Your Speed warning to approaching drivers

Alert approaching driver of his vehicle speed and to take appropriate action to reduce speed.



Blind spot sensor of vehicles

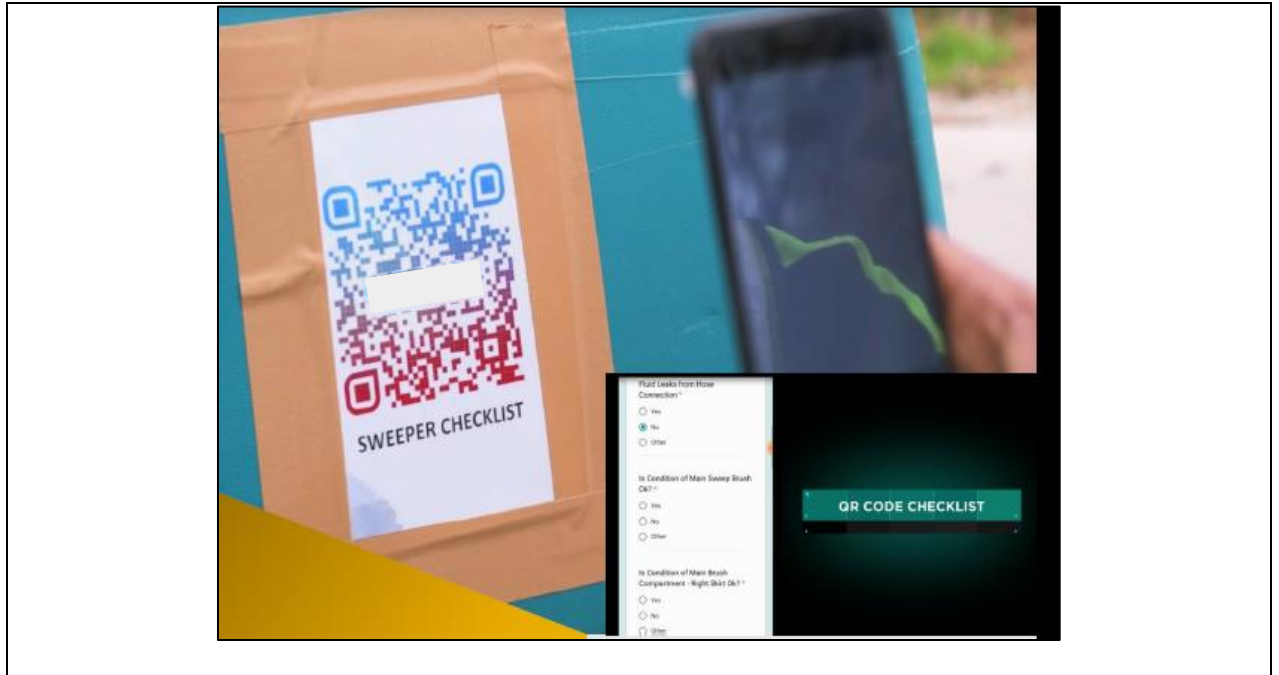
Alert driver on the blind spots of vehicles when reversing or moving into adjacent lanes.



|   |  |
|---|--|
| Driver behaviour and fatigue management | Alert driver when allowable speed is exceeded or when fatigue sets in. Provides fleet management through indicators such as speeding |
|---|--|



|                   |   |
|-------------------|---|
| QR Code Checklist | Enables instantaneous retrieval of inspection checklists and other document and improve accountability of documents |
|-------------------|---|



## 8. References

- a. WSHC Workplace Safety and Health Guidelines – Workplace Traffic Safety Management (1<sup>st</sup> rev 2014) and WSHC online resources.
- b. Traffic Safety at LTA Worksites
- c. LTA Good Practices Handbook (2018 ed)
- d. Contribution materials from the following SCAL members:
  - i. Penta-Ocean Construction Co Ltd
  - ii. Samwoh Corporation Pte Ltd
  - iii. Sembcorp Specialised Construction Pte Ltd
  - iv. Shimizu Corporation
  - v. Teambuild Engineering & Construction Pte Ltd
  - vi. Tiong Aik Construction Pte Ltd
  - vii. Straits Construction Singapore Pte Ltd

## ANNEXES:

### Annex A -Sample: Roles and Responsibilities

#### Annex 1: Roles and Responsibilities

To have an effective Traffic Management Plan, each stakeholder got to carry out their duties and responsibilities effectively. These duties and responsibilities include:

##### a. Responsibilities of Project Management Team (PMT)

- Project Management Team includes person-in-charge such as Project Manager, Construction Manager, Engineers, WSH personnel, supervisors, foremen.
- Their responsibilities include (non-exhaustive):
  - i. Project manager shall develop and implement the workplace traffic safety management plan with the assistance of Construction Manager and WSH Officer;
  - ii. Project Manager and WSH Officer shall ensure that the workplace traffic safety management plan is implemented effectively and communicated to all levels of workers;
  - iii. Engineers and trade supervisors shall ensure that workplace traffic safety rules, training programmes and safe work procedures (SWPs) are followed by workers;
  - iv. Engineers and trade supervisors shall provide the training and awareness amongst drivers to encourage systematic parking, following traffic rules, preventing unnecessary stoppages and overtaking
  - v. Engineers and trade supervisors shall provide all workers with the necessary information, instruction, training and supervision to ensure their safety and health at the workplace;
  - vi. Engineers and trade supervisors shall provide and ensure proper use of personal protective equipment (PPE);
  - vii. Engineers and trade supervisors shall ensure that there are safe means of access to and egress from any part of the workplace
  - viii. Engineers and trade supervisors shall ensure that all equipment (including vehicles) used are properly maintained in accordance with the manual;
  - ix. Engineers and trade supervisors shall ensure that all workers under their charge have attended the relevant safety training course and possess the relevant certification for the work that is to be carried out;
  - x. Engineers and trade supervisors shall provide all necessary emergency facilities required at a workplace such as first aid kits;
  - xi. Engineers and trade supervisors shall ensure that workers are familiar with the contingency or emergency plan;
  - xii. WSH Officer / or his designate shall keep records of reported accidents, incidents and diseases and take necessary action to prevent a recurrence;
  - xiii. WSH Officer / or his designate shall undertake monthly monitoring to ensure proper implementation of the proposed mitigation and

management measures in accordance with the requirements of the Traffic Safety Management Monitoring Checklist.

- xiv. Construction Manager/ WSH Officer shall review the monitoring checklist and corrective action form to ensure appropriate corrective actions are proposed and implementation is undertaken by the timescale specified.

**b. Responsibilities of Workers**

- Workers include construction workers, machine operators, drivers.
- Their responsibilities include:
  - i. Follow workplace traffic instructions and safety warnings or signages at the workplace
  - ii. Attend workplace traffic safety and health training or briefing sessions
  - iii. Only operate plant or equipment if they hold valid licences, possess the relevant safety certification and have been given the authorisation to do so
  - iv. Understand where the blind spot of the operated machines.
  - v. Observe emergency procedures, instructions and arrangements as established and instructed
  - vi. Operate equipment with care and do not use equipment (including vehicles) beyond their capacity or designated purpose;
  - vii. Use all safety devices and PPE as provided
  - viii. Never misuse, interfere with or modify any of the devices or equipment
  - ix. Report any damage, malfunction or suspected defect of plant, equipment, safety device or PPE to their respective supervisor
  - x. Report accidents, incidents, diseases and any workplace hazards to the supervisor or person-in-charge
  - xi. Suggest ways to improve traffic safety at the workplace if they identify any lapses during the course of work.

**c. Responsibilities of Traffic Controllers / Banksmen**

- Trained traffic controllers / banksmen shall be appointed to assist in directing transport vehicles at the workplace during difficult manoeuvres such as unavoidable blind spots and tight bends.
- Where the driver has difficulty seeing a single traffic controller / banksman, two or more traffic controllers / banksmen, or other alternatives should be appointed.
- Traffic controllers / banksmen must be properly trained to direct traffic and are aware of the risks they are exposed to.
- Traffic Controller / banksman shall wear the following standardised PPE:
  - i. Safety helmet, safety boots and reflective vest with “Traffic Controller” / “Banksman” labelled behind the vest.
  - ii. Reflective hand glove or baton
  - iii. Whistle

- The following are some responsibilities (not exhaustive) of traffic controllers / banksmen:
  - i. To control and direct traffic flow to ensure vehicles and personnel access in and around the Workplace boundary safely
  - ii. Observe SWPs or safe traffic measures
  - iii. Remain highly visible to the driver at all times
  - iv. Use a clear or standard signalling system understood by the driver
  - v. Stand at a safe position while guiding the transport vehicle
  - vi. Wear highly visible reflective vests at all time

**d. Responsibilities of Sub-Contractors/ Suppliers Person In-Charge**

- To provide direction and coordination related to the use of work access.
- To ensure traffic controller is deployed at their area of work to control and direct traffic.
- To provide feedback on any of the project's traffic related issues to Project Management Team.
- To nominate trained and qualified personnel for authorisation by Project Management Team to operate vehicles / mobile machinery on the project site.
- To ensure all faulty vehicles and mobile machinery are Locked Out and Tagged. To verify that the repaired vehicles / mobile machinery is repaired satisfactorily and in safe for use condition before removing the LOTO and informing authorised operators the repaired vehicles / mobile machinery is safe for use.

**e. Responsibilities of Vehicle Driver / Mobile Machinery Operator**

- To adhere to all project rules and regulations, risk assessments and safe work procedures whilst operating the vehicles and mobile machinery as per instructions.
- All vehicle drivers / mobile machinery operators shall conduct daily pre-operation inspection on their vehicle / mobile machinery prior to use. They shall feedback to their immediate supervisor / Project management team if they discover the vehicle / mobile machinery is faulty.
- Drivers and operators shall turn on the lights of their vehicles and mobile machinery when the visibility is low.
- To ensure all loads are tied and secure before commencing transportation.
- To ensure all unattended vehicles and mobile machineries are effectively immobilised to prevent rolling / sliding, etc. by ensuring the vehicle / mobile machinery is set in "Parking" gear with hand-brake applied. Wheel chocks shall be provided to chock the wheels from movement.
- To ensure wheels of vehicles and mobile machinery under repair are chock using wheel chocks.
- All drivers and operators must observe the safety of other personnel and ensure pedestrians always have the right of way.

- Sound the horn prior to reversing and whenever driving off from stationary position.
- To report all incidents and near-miss to their immediate supervisor / project management team.
- To assist in investigation of traffic related incidents.
- Do not operate the vehicle / mobile machinery if the driver/ operator is feeling unwell or is under medication that may cause drowsiness.

**f. Responsibilities of Pedestrians**

- To adhere to all rules and regulations, whilst walking at the designated safe personnel walkway.
- To understand and follow all safety signs posted in all working areas.
- To be alert of all the vehicles and mobile machinery around their walking area.

**g. Responsibilities of Visitors**

- All visitors must only enter through the designate personnel entry / exit access points and report to the project security post to register their details.
- Visitors who have to drive into the project premises must register their vehicle with the project security.
- Visitors shall be briefed on the project's WSH requirements before they are allowed to enter the project premise.
- All visitors, except ad-hoc suppliers and persons performing self-collection shall be accompanied by the project personnel that they are visiting.

## Annex B – Samples of Risk Assessment for Site Traffic-related hazards

### Sample No: 1

| WSH Risk Assessment (WSH RA) - CONSTRUCTION SITE TRAFFIC MANAGEMENT GUIDE |                                      |             |             |                   |                 |                   |            |             |                  |  |
|---|--------------------------------------|-------------|-------------|-------------------|-----------------|-------------------|------------|-------------|------------------|--|
| Project:  | XXX Project                          | Company:    | XYZ Pte Ltd | Reference No.:    | SCAL/RA/Annex A | Rev No.:          | 00         |             |                  |  |
| Title of WSH RA:  | Site Traffic-related hazards         |             |             |                   |                 | Next Review Date: | DD MM YYYY |             |                  |  |
| Work Process / Activity:  | General Vehicular Traffic Management |             |             | Work Location(s): | Within Site     |                   |            |             |                  |  |
| <b>WSH RA Conducted By:</b>   |                                      |             |             |                   |                 |                   |            |             |                  |  |
| S/N   | Name                                 | Company     | Designation | Signature / Date  | S/N             | Name              | Company    | Designation | Signature / Date |  |
| 1   |                                      | XYZ Pte Ltd |             |                   | 7               |                   |            |             |                  |  |
| 2   |                                      | ABC Pte Ltd |             |                   | 8               |                   |            |             |                  |  |
| 3   |                                      | XX Pte Ltd  |             |                   | 9               |                   |            |             |                  |  |
| 4   |                                      |             |             |                   | 10              |                   |            |             |                  |  |
| 5   |                                      |             |             |                   | 11              |                   |            |             |                  |  |
| 6   |                                      |             |             |                   | 12              |                   |            |             |                  |  |

| WSH RA Approved By: |      |             |                 |           |               |
|---------------------|------|-------------|-----------------|-----------|---------------|
| S/N                 | Name | Company     | Designation     | Signature | Approval Date |
| 1                   |      | XYX Pte Ltd | Project Manager |           |               |
| 2                   |      |             |                 |           |               |



| WSH Risk Matrix   |   |  |                         |  |  |                            |                   |                                   |
|---|---|--|-------------------------|--|--|----------------------------|-------------------|-----------------------------------|
| Severity  |   | Likelihood   |                         | Rare (1)                                 | Remote (2)   | Occasional (3)             | Frequent (4)      | Almost Certain (5)                |
|   |   |  |                         | Not expected to occur but still possible | No likely to occur under normal circumstances  | Possible or known to occur | Common occurrence | Continual or repeating experience |
| <b>Catastrophic (5)</b>   | <ul style="list-style-type: none"> <li>Fatality, fatal diseases or multiple major injuries or permanent disability.</li> <li>Effect on human community and resulting outrage is high with possibility of civil legal action being taken against the company.</li> <li>May result in Authority summon to court, stop work order &amp; heavy penalty fines.</li> </ul>  | <b>Medium Risk (5)</b>   | <b>Medium Risk (10)</b> | <b>High Risk (15)</b>                    | <b>High Risk (20)</b>  | <b>High Risk (25)</b>      |                   |                                   |
| <b>Major (4)</b>  | <ul style="list-style-type: none"> <li>Serious injuries or life-threatening occupational diseases, or injury requiring professional medical attention with 4 or more days of medical leave given or hospitalization for more than 24 hours.</li> <li>Effect on human community and resulting outrage is high with possibility of civil legal action being taken against the company.</li> <li>May result in Authority summon to court, stop work order or heavy penalty fines.</li> </ul> | <b>Medium Risk (4)</b>   | <b>Medium Risk (8)</b>  | <b>Medium Risk (12)</b>                  | <b>High Risk (16)</b>  | <b>High Risk (20)</b>      |                   |                                   |
| <b>Moderate (3)</b>   | <ul style="list-style-type: none"> <li>Injury or ill-health leading to temporary disability (i.e. minor fractures, cuts, wounds that require stitches, etc.).</li> <li>Require professional medical attention with less than 3 days of medical leave given or hospitalization for less than 24 hours.</li> <li>Effect on human community and outrage caused is moderate / minimal.</li> <li>May result in Authority warnings or minimal penalty fines.</li> </ul>                         | <b>Low Risk (3)</b>  | <b>Medium Risk (6)</b>  | <b>Medium Risk (9)</b>                   | <b>Medium Risk (12)</b>  | <b>High Risk (15)</b>      |                   |                                   |
| <b>Minor (2)</b>  | <ul style="list-style-type: none"> <li>Injury or ill-health requiring only first-aid treatment (e.g. minor cuts &amp; bruises, irritation, ill-health with temporary discomfort).</li> <li>Little or no possibility of legal implications.</li> </ul>   | <b>Low Risk (2)</b>  | <b>Medium Risk (4)</b>  | <b>Medium Risk (6)</b>                   | <b>Medium Risk (8)</b>   | <b>Medium Risk (10)</b>    |                   |                                   |
| <b>Negligible (1)</b>   | <ul style="list-style-type: none"> <li>Not likely to cause injury or ill-health.</li> </ul>   | <b>Low Risk (1)</b>  | <b>Low Risk (2)</b>     | <b>Low Risk (3)</b>                      | <b>Medium Risk (4)</b>   | <b>Medium Risk (5)</b>     |                   |                                   |
| <b>Low Risk (1 to 3) = ACCEPTABLE</b>   |   | <b>Medium Risk (4 to 12) = TOLERABLE</b>   |                         |  | <b>High Risk (15 to 25) = NOT ACCEPTABLE</b>   |                            |                   |                                   |
| <ul style="list-style-type: none"> <li>No additional risk control measures are required.</li> <li>Frequent review is required to ensure that the risk / impact level assigned is accurate and does not increase over time.</li> </ul> |   | <ul style="list-style-type: none"> <li>A careful evaluation of the hazards should be carried out to ensure that the risk level is reduced to as low as reasonably practicable (ALARP) within a defined timeframe.</li> <li>Interim risk control measures such as administrative controls shall be implemented.</li> <li>Management attention is required.</li> </ul> |                         |  | <ul style="list-style-type: none"> <li>High Risk Level must be reduced to at least Medium Risk Level before work can commence.</li> <li>There should not be any interim risk control measures &amp; control measures should not be overly dependent on administrative control or personal protective equipment.</li> <li>If practicable, the hazard should be eliminated before work commencement.</li> <li>Management review is required before work commencement.</li> </ul> |                            |                   |                                   |

**WSH Risk Assessment (WSH RA)**

| WSH Hazard & Risk Identification |  |   | Control Measures for Initial Risks  | Initial Risk Index*  | Control Measures for Residual Risks | Residual Risk Index* | Person In-Charge for Control Measures |   |   |   |   |  |
|----------------------------------|--|---|---|--|-------------------------------------|----------------------|---------------------------------------|---|---|---|---|--|
| S/N                              | Process / Work Activity  | WSH Hazard  | WSH Risk  | Existing Control Measures  | S                                   | L                    | R                                     | Additional Control Measures   | S | L | R | Person In-Charge   |
| 1.0                              | Personnel and vehicles accessing into the work site from the access gates. | <p><u>WSH Hazard:</u></p> <ul style="list-style-type: none"> <li>No proper safe personnel access walkway provided at the gate access</li> <li>Personnel and vehicle using the same access way to enter/exit the project.</li> </ul> | <p><u>WSH Risk:</u></p> <ul style="list-style-type: none"> <li>Vehicle hitting personnel at the gate area while entering/exiting the worksite</li> <li>Fatality or serious injury to personnel</li> </ul> | <p><b>ENGINEERING CONTROLS</b></p> <ul style="list-style-type: none"> <li>Provide physically separated personnel access gate from the vehicle access gate at the project's work access points.</li> <li>Provide blinking/rotating warning lights, speed limit sign and convex mirror at each vehicle access gate to alert driver and provide them with visual aids and information to drive in and out of the work site safely.</li> <li>Provision of lighting at the personnel and vehicle entry/exit gates to illuminate the area for safe access</li> </ul> <p><b>ADMIN CONTROLS</b></p> <ul style="list-style-type: none"> <li>Post information signs at the personnel access gate to indicate it is a designated personnel entry and exit point into the worksite.</li> <li>Full time gate marshals provided at each gate to guide &amp; ensure workers use the designated personnel access gates to enter/exit the work site.</li> <li>Paint the portion of the ground crossing from one end of the gate to the other end with Red &amp; White stripes to warn drivers to slow down and</li> </ul> | 5                                   | 2                    | 10                                    | <p><b>ADMIN CONTROLS</b></p> <ul style="list-style-type: none"> <li>Conduct in-house briefing of project's personnel access walkway entry/exit points to inform all workers.</li> <li>Supervisors to brief workers during their daily Toolbox Meetings to remind them to only use designated safe personnel access entry / exit points to enter or exit the worksite.</li> <li>Daily inspection and maintenance of personnel access entry / exit gates by designated person in-charge.</li> <li>Vehicles entering the worksite must switch on their headlights and limit their speed to only 15-20km/hr. Personnel ALWAYS have the Right of Way and vehicles MUST stop to allow personnel to move off safely first before proceeding where necessary</li> </ul> | 5 | 1 | 5 | <ul style="list-style-type: none"> <li>Engineer In-charge</li> <li>Supervisor In-charge</li> </ul> |

| WSH Risk Assessment (WSH RA)     |   |  |  |   |                     |   |    |   |                      |   |   |  |
|----------------------------------|---|--|--|---|---------------------|---|----|---|----------------------|---|---|--|
| WSH Hazard & Risk Identification |   |  |  | Control Measures for Initial Risks  | Initial Risk Index* |   |    | Control Measures for Residual Risks   | Residual Risk Index* |   |   | Person In-Charge for Control Measures  |
| S/N                              | Process / Work Activity   | WSH Hazard   | WSH Risk   | Existing Control Measures   | S                   | L | R  | Additional Control Measures   | S                    | L | R | Person In-Charge   |
|                                  |   |  |  | stop to look out for personnel/pedestrian who maybe crossing the access gate  |                     |   |    | <ul style="list-style-type: none"> <li>Conspicuous information signboards stating this requirement shall be posted at the entry of every vehicle access gates to inform drivers of the requirements. Stating this requirement shall be posted at the entry of every vehicle access gates to inform drivers of the requirements.</li> </ul> <p><b>PPE</b></p> <ul style="list-style-type: none"> <li>All personnel must always wear their safety reflective vests before entering the work site and while they are in the worksite.</li> </ul> |                      |   |   |  |
| 2.0                              | Personnel accessing to different work areas within the worksite | <u>WSH Hazard:</u> <ul style="list-style-type: none"> <li>No proper safe personnel access walkway provided for worker to access to different work areas within the work site.</li> <li>Personnel and moving</li> </ul> | <u>WSH Risk:</u> <ul style="list-style-type: none"> <li>Vehicles/ machinery hitting personnel when moving within the worksite.</li> <li>Fatality or serious injury to personnel</li> </ul> | <b>ENGINEERING CONTROLS</b> <ul style="list-style-type: none"> <li>Provide personnel access walkway (of at least 900mm in width) that are physically separated from vehicle access way, using rigid barrier system such as water barriers, rigid barricade, etc.</li> <li>Personnel and vehicle access walkway/driveway must be provided with adequate illumination.</li> </ul> | 5                   | 2 | 10 | <b>ADMIN CONTROLS</b> <ul style="list-style-type: none"> <li>Conduct in-house briefing of project's personnel access walkway entry/exit points to inform all workers.</li> <li>Supervisors to brief workers during their daily Toolbox Meetings to</li> </ul>   | 5                    | 1 | 5 | <ul style="list-style-type: none"> <li>Engineer In-charge</li> <li>Supervisor In-charge</li> </ul> |

**WSH Risk Assessment (WSH RA)**

| WSH Hazard & Risk Identification |                         |   |          | Control Measures for Initial Risks  | Initial Risk Index* |   |   | Control Measures for Residual Risks  | Residual Risk Index* |   |   | Person In-Charge for Control Measures |
|----------------------------------|-------------------------|---|----------|---|---------------------|---|---|--|----------------------|---|---|---------------------------------------|
| S/N                              | Process / Work Activity | WSH Hazard  | WSH Risk | Existing Control Measures   | S                   | L | R | Additional Control Measures  | S                    | L | R | Person In-Charge                      |
|                                  |                         | vehicles/ machinery using the same access way to move within the worksite |          | <p><b>ADMIN CONTROLS</b></p> <ul style="list-style-type: none"> <li>• Install symbol directional signs and text-form informational signs to guide workers along the routes of the personnel access walkway.</li> <li>• At areas where it is designated for personnel to cross over a vehicle access driveway, the crossing shall be demarcated clearly by painting red and white stripes on the ground. Designated personnel crossing signs and STOP signs shall be provided facing both the directions to inform drivers to slow down and stop when personnel are crossing the driveway.</li> <li>• Implement project requirement that all personnel must observe a safety distance away of at least 5 meters from all moving vehicles.</li> </ul> |                     |   |   | <p>remind them to only use designated safe personnel access entry/exit points to enter or exit the worksite.</p> <ul style="list-style-type: none"> <li>• Daily inspection and maintenance of personnel access entry/exit gates by designated person in-charge.</li> <li>• Vehicles moving the worksite must switch on their headlights lights and limit their speed to only 15-20km/hr. Personnel ALWAYS have the Right of Way and vehicles MUST stop to allow personnel to move off safely first before proceeding where necessary. Conspicuous information signboards stating this requirement shall be posted at the entry of every vehicle access gates to inform drivers of the requirements.</li> </ul> |                      |   |   |                                       |

| WSH Risk Assessment (WSH RA)     |                                      |   |  |   |                     |   |    |   |                      |   |   |  |
|----------------------------------|--------------------------------------|---|--|---|---------------------|---|----|---|----------------------|---|---|--|
| WSH Hazard & Risk Identification |                                      |   |  | Control Measures for Initial Risks  | Initial Risk Index* |   |    | Control Measures for Residual Risks   | Residual Risk Index* |   |   | Person In-Charge for Control Measures  |
| S/N                              | Process / Work Activity              | WSH Hazard  | WSH Risk   | Existing Control Measures   | S                   | L | R  | Additional Control Measures   | S                    | L | R | Person In-Charge   |
|                                  |                                      |   |  |   |                     |   |    | <b>PPE</b> <ul style="list-style-type: none"> <li>All personnel must always wear their safety reflective vests before entering the work site and while they are in the worksite.</li> </ul>   |                      |   |   |  |
| 3.0                              | Vehicles moving within the worksite. | <u>WSH Hazard:</u> <ul style="list-style-type: none"> <li>Vehicles reversing in the worksite</li> </ul> | <u>WSH Risk:</u> <ul style="list-style-type: none"> <li>Vehicles hitting personnel, structure, equipment, material, etc. when moving within the worksite.</li> </ul> | <b>ADMIN CONTROLS</b> <ul style="list-style-type: none"> <li>Implement restriction on the areas whereby vehicles may reverse. Areas whereby vehicles may reverse shall be demarcated with signs.</li> <li>Implement project requirement that vehicles may only reverse under the direction of a banksman or signaler.</li> <li>Banksman/signaler must observe the safe distance of at least 5 meters from the vehicle and must always stand at the driver's side of the vehicle to ensure the driver</li> </ul><br><b>PPE</b> <ul style="list-style-type: none"> <li>Banksman/signaler must be attired in safety reflective vests and wearing the traffic signal gloves.</li> </ul> | 5                   | 2 | 10 | <b>ADMIN CONTROLS</b> <ul style="list-style-type: none"> <li>Conduct in-house briefing of project's personnel and drivers on the safety requirements for driving on the worksite.</li> <li>Supervisors to brief workers during their daily Toolbox Meetings to remind them to only use the designated safe personnel access walkways to move within the worksite and maintain a safety distance of at least 5 meters away from all vehicles.</li> </ul> | 5                    | 1 | 5 | <ul style="list-style-type: none"> <li>Engineer In-charge</li> <li>Supervisor In-charge</li> <li>Vehicle Driver In-Charge</li> </ul> |
| 4.0                              | Vehicles moving on                   | <u>WSH Hazard:</u>  | <u>WSH Risk:</u>   | <b>ADMIN CONTROLS</b>   | 5                   | 2 | 10 | <b>ADMIN CONTROLS</b>   | 5                    | 1 | 5 | <ul style="list-style-type: none"> <li>Engineer In-charge</li> </ul>   |

**WSH Risk Assessment (WSH RA)**

| WSH Hazard & Risk Identification |                         |   | Control Measures for Initial Risks   | Initial Risk Index*   | Control Measures for Residual Risks | Residual Risk Index* | Person In-Charge for Control Measures |   |   |   |   |  |
|----------------------------------|-------------------------|---|--|---|-------------------------------------|----------------------|---------------------------------------|---|---|---|---|--|
| S/N                              | Process / Work Activity | WSH Hazard  | WSH Risk   | Existing Control Measures   | S                                   | L                    | R                                     | Additional Control Measures   | S | L | R | Person In-Charge   |
|                                  | vehicle ramp areas      | <ul style="list-style-type: none"> <li>Personnel accessing vehicle ramp areas illegally</li> </ul>          | <ul style="list-style-type: none"> <li>Vehicles hitting personnel moving on the vehicle ramp.</li> </ul>                                       | <ul style="list-style-type: none"> <li>No personnel are allowed to use the vehicle ramp as personnel access. Only vehicles are allowed to access the vehicle ramps.</li> <li>Warning signs shall be provided at all entry/exit points leading to the vehicle ramp areas at every level to warn personnel from accessing the ramp as personnel access walkway.</li> <li>No personnel are allowed to rest at the vehicle ramp area at ALL TIMES, including during breaks and after office hours.</li> <li>The project shall include personnel performing work on vehicle ramp in their Permit To Work System to control all personnel and work at the ramp areas.</li> <li>In cases of personnel having to access and perform work at the ramp area, the same physical provisions for personnel access walkway shall be implemented.</li> </ul> |                                     |                      |                                       | <ul style="list-style-type: none"> <li>Conduct in-house briefing of project's personnel and drivers on the risk controls for vehicle ramp areas.</li> <li>Supervisors to brief workers during their daily Toolbox Meetings to remind them on the restriction to access the vehicle ramp areas.</li> </ul> |   |   |   | <ul style="list-style-type: none"> <li>Supervisor In-charge</li> </ul>                             |
|                                  |                         | <p><u>WSH Hazard:</u></p> <ul style="list-style-type: none"> <li>Vehicle accessing the ramp area</li> </ul> | <p><u>WSH Risk:</u></p> <ul style="list-style-type: none"> <li>Vehicles colliding or hitting structures /other vehicles when moving</li> </ul> | <p><b>ENGINEERING CONTROLS</b></p> <ul style="list-style-type: none"> <li>The ramp shall be separated by means of rigid barrier system at the center to separate and guide vehicles moving up and down the</li> </ul>   | 5                                   | 2                    | 10                                    | <p><b>ADMIN CONTROLS</b></p> <ul style="list-style-type: none"> <li>Conduct in-house briefing of project's personnel and drivers on the risk controls for</li> </ul>  | 5 | 1 | 5 | <ul style="list-style-type: none"> <li>Engineer In-charge</li> <li>Supervisor In-charge</li> </ul> |

**WSH Risk Assessment (WSH RA)**

| WSH Hazard & Risk Identification |                         |            |             | Control Measures for Initial Risks   | Initial Risk Index* |   |   | Control Measures for Residual Risks  | Residual Risk Index* |   |   | Person In-Charge for Control Measures |
|----------------------------------|-------------------------|------------|-------------|--|---------------------|---|---|--|----------------------|---|---|---------------------------------------|
| S/N                              | Process / Work Activity | WSH Hazard | WSH Risk    | Existing Control Measures  | S                   | L | R | Additional Control Measures  | S                    | L | R | Person In-Charge                      |
|                                  |                         |            | on the ramp | ramps with provision of direction signs. <ul style="list-style-type: none"> <li>Convex mirrors shall be provided at suitable locations as visual aids for drivers to see blind spots at turning points.</li> <li>Speed limit of 5km/hr shall be imposed for all vehicles moving on the ramp areas. Speed humps may be provided at appropriate locations to slow vehicles down.</li> <li>Adequate lighting shall be provided along the entire vehicle ramp area.</li> </ul> <p><b>ADMIN CONTROLS</b></p> <ul style="list-style-type: none"> <li>One-way traffic lanes shall be marked with a no-entry sign on the exit.</li> <li>Warning signs such as speed limits, STOP signs, SLOW DOWN signs, LOOK OUT FOR PEDESTRIANS signs, etc. to warn drivers.</li> <li>Objects are not allowed to be placed or stored on the vehicle ramp areas</li> <li>All obstructions on the ramp shall be brightly cordoned off and demarcated to warn the drivers.</li> <li>No material, equipment, machinery, objects are allowed to be placed or stored on the vehicle ramp areas.</li> </ul> |                     |   |   | vehicle ramp areas. <ul style="list-style-type: none"> <li>Supervisors to brief workers during their daily Toolbox Meetings to remind them on the restriction to access the vehicle ramp areas.</li> </ul> |                      |   |   |                                       |

| WSH Risk Assessment (WSH RA)     |                         |   |   |  |                     |   |    |   |                      |   |   |  |
|----------------------------------|-------------------------|---|---|--|---------------------|---|----|---|----------------------|---|---|--|
| WSH Hazard & Risk Identification |                         |   |   | Control Measures for Initial Risks   | Initial Risk Index* |   |    | Control Measures for Residual Risks   | Residual Risk Index* |   |   | Person In-Charge for Control Measures  |
| S/N                              | Process / Work Activity | WSH Hazard  | WSH Risk  | Existing Control Measures  | S                   | L | R  | Additional Control Measures   | S                    | L | R | Person In-Charge   |
| 5.0                              | Vehicle parking         | <u>WSH Hazard:</u><br><ul style="list-style-type: none"> <li>Parking on non-designated areas</li> </ul> | <u>WSH Risk:</u><br><ul style="list-style-type: none"> <li>Illegally parked vehicle becomes obstruction to other site operation and risk human injury and property damage in the event of collision.</li> </ul> | <b>ADMIN CONTROLS</b><br><ul style="list-style-type: none"> <li>Signage to enforce no parking in non-designated areas.</li> <li>Regular briefing to all site stakeholders on parking rules and guide.</li> </ul> | 3                   | 4 | 12 | <b>ADMIN CONROLS</b><br><ul style="list-style-type: none"> <li>Regular enforcement on illegal parking.</li> </ul> | 3                    | 3 | 9 | <ul style="list-style-type: none"> <li>Engineer In-charge</li> <li>Supervisor In-charge</li> </ul> |
|                                  |                         | <ul style="list-style-type: none"> <li>Parking on slope</li> </ul>                                      | <ul style="list-style-type: none"> <li>Vehicle roll down slope.</li> </ul>  | <ul style="list-style-type: none"> <li>No parking on slope warning sign displayed.</li> </ul>  | 4                   | 3 | 12 | <ul style="list-style-type: none"> <li>Regular enforcement on illegal parking.</li> </ul>                         | 4                    | 2 | 8 | <ul style="list-style-type: none"> <li>Engineer In-charge</li> <li>Supervisor In-charge</li> </ul> |

\* S = Severity; L = Likelihood; R = Risk Rating



**Sample No: 2**

| Hazard Identification |                                      |  | Risk Evaluation   |  |   |   |     |                     |   |   |     | Risk Control  |          |         |
|-----------------------|--------------------------------------|--|---|--|---|---|-----|---------------------|---|---|-----|---|----------|---------|
| Ref                   | Work Activity                        | Hazard                                 | Possible Accident or Injury & Ill health                                  | Existing Risk Controls   | S | L | RPN | Additional Controls | S | L | RPN | Implementation Person                                 | Due Date | Remarks |
| 1                     | Drivers credential                   | Unauthorized driving                   | Fatal   | <p><b>- Elimination -</b></p> <p><b>-Substitution -</b></p> <p><b>-Engineering Controls-</b></p> <p><b>-Administrative Controls-</b></p> <p>- Only drivers with the qualified class of license to drive the vehicles (Class 3 &amp; above)</p> <p>-Statutory safety training and in-house safety training</p> <p>-Drivers to adhere to road traffic Act and LTA requirements</p> <p><b>-PPE-</b></p> | 5 | 1 | 5   | NIL                 | 5 | 1 | 5   | Site Supervisor<br><br>WSHC<br><br>Traffic Controller | 21/09/19 |         |
| 2                     | Entry/Exit of vehicles via site gate | Knockdown or run over by the vehicles. | <p>- Serious Injury to body</p> <p>-Fatal</p> <p>- Damage to property</p> | <p><b>- Elimination -</b></p> <p><b>-Substitution -</b></p> <p><b>-Engineering Controls</b></p> <p>-Ensure sufficient width for vehicles to ingress/egress</p> <p>- Maintain regularly the vehicles.</p> <p>- Blind spot mirrors to install</p> <p><b>Administrative Controls-</b></p> <p>- Workers at washing bay are</p>   | 5 | 2 | 10  | NIL                 | 5 | 1 | 5   | Site Supervisor<br><br>WSHC<br><br>Traffic Controller | 21/09/19 |         |

| Hazard Identification |                                   |  | Risk Evaluation   |  |   |   |     |                     |   |   |     | Risk Control  |          |         |
|-----------------------|-----------------------------------|--|---|--|---|---|-----|---------------------|---|---|-----|---|----------|---------|
| Ref                   | Work Activity                     | Hazard                                 | Possible Accident or Injury & Ill health                                  | Existing Risk Controls   | S | L | RPN | Additional Controls | S | L | RPN | Implementation Person                                 | Due Date | Remarks |
|                       |                                   |  |   | <p>trained and alert.</p> <p>-Drivers are inducted to follow the speed limit in site(15 kph)</p> <p>-Use baton, illuminous vest and gloves.</p> <p>- Provide proper signage's at the entry /exit point</p> <p><b>-PPE</b></p> <p>Helmet, Safety shoes, reflective vest, reflective hand gloves and other PPE.</p>  |   |   |     |                     |   |   |     |   |          |         |
| 3                     | Driving within site and reversing | Knockdown or run over by the vehicles. | <p>- Serious Injury to body</p> <p>-Fatal</p> <p>- Damage to property</p> | <p><b>-Elimination -</b></p> <p><b>-Substitution -</b></p> <p><b>-Engineering Controls</b></p> <p>-Regular maintenance of vehicle</p> <p>-No illegal modification</p> <p>-Clear demarcation of the entry /exit point</p> <p><b>-Administrative Controls-</b></p> <p>- Workers at washing bay are trained and alert.</p> <p>-Drivers are inducted to follow the speed</p> | 5 | 2 | 10  | NIL                 | 5 | 1 | 5   | Site Supervisor<br><br>WSHC<br><br>Traffic Controller | 21/09/19 |         |

| Hazard Identification |  |  | Risk Evaluation                            |   |   |   |     |                     |   |   |     | Risk Control  |          |         |
|-----------------------|--|--|--|---|---|---|-----|---------------------|---|---|-----|---|----------|---------|
| Ref                   | Work Activity                          | Hazard   | Possible Accident or Injury & Ill health   | Existing Risk Controls  | S | L | RPN | Additional Controls | S | L | RPN | Implementation Person                                 | Due Date | Remarks |
|                       |  |  |  | limit in site (15 kph)<br><br>-Use baton, illuminous vest and gloves.<br><br>- Provide proper signage's at the entry /exit point<br><br>-No works during adverse weather<br><br>-Adequate illumination during night.<br><br>-Effective supervision<br><br><b>-PPE</b><br><br>Helmet, Safety shoes, reflective vest, reflective hand gloves and other PPE. |   |   |     |                     |   |   |     |   |          |         |
| 4                     | Maintenance works and regular services | Stuck by machinery / Maintenance staff suffered electrical shock/Body parts caught in between/Slips, trips and falls | Serious injuries ,cuts, fatal , amputation | <b>-Elimination –</b><br>Major repairs should be done at the workshops<br><br><b>-Substitution -</b><br><br><b>-Engineering Controls</b><br><br>-Park the vehicle at stable position<br><br><b>- Administration</b><br><br>-Trained and authorised person to carry out<br><br>- Using proper tools<br><br>-Buddy system to follow                         | 5 | 2 | 10  | NIL                 | 5 | 1 | 5   | Site Supervisor<br><br>WSHC<br><br>Traffic Controller | 21/09/19 |         |

| Hazard Identification |                  |  | Risk Evaluation   |   |   |   |     |                     |   |   |     | Risk Control  |          |         |
|-----------------------|------------------|--|---|---|---|---|-----|---------------------|---|---|-----|---|----------|---------|
| Ref                   | Work Activity    | Hazard                                 | Possible Accident or Injury & Ill health                  | Existing Risk Controls  | S | L | RPN | Additional Controls | S | L | RPN | Implementation Person                                 | Due Date | Remarks |
|                       |                  |  |   | -Good housekeeping<br><br>-Effective supervision<br><br><b>-PPE</b><br><br>Helmet, safety shoe/full body harness, goggle, gloves & Etc.   |   |   |     |                     |   |   |     |   |          |         |
| 5                     | Adverse weathers | High humidity/Hot/Heavy rain/Lightning | Heat cramps, Stress,<br><br>Electrocution & Slip and fall | <b>-Elimination -</b><br><br><b>-Substitution -</b><br><br><b>-Engineering Controls</b><br><br>-Regular service of air cons<br><br>-Provision of good rest area<br><br>-Provision of cool drinking waters<br><br>- Standby fire extinguishers<br><br><b>-Administrative Controls-</b><br><br>-Train to identify the adverse weather<br><br>-Heat stress programs<br><br>-Maintain lightning system<br><br>-Regular supervision<br><br><b>-PPE</b> | 5 | 1 | 5   | NIL                 | 5 | 1 | 5   | Site Supervisor<br><br>WSHS<br><br>Traffic Controller | 21/09/19 |         |

| Hazard Identification |                |   | Risk Evaluation   |   |   |   |     |                     |   |   |     | Risk Control  |          |         |
|-----------------------|----------------|---|---|---|---|---|-----|---------------------|---|---|-----|---|----------|---------|
| Ref                   | Work Activity  | Hazard  | Possible Accident or Injury & Ill health                  | Existing Risk Controls  | S | L | RPN | Additional Controls | S | L | RPN | Implementation Person                                 | Due Date | Remarks |
|                       |                |   |   | Helmet, safety shoe/full body harness, goggle, gloves & Etc.  |   |   |     |                     |   |   |     |   |          |         |
| 6                     | Health hazards | -Noise, Heat, Dust, Ergonomics related factor, Fatigue, Wrong decision making & Taking short cuts | NID, Heat stress, Allergies, Cancers, Fatal, Lung disease | <p><b>-Elimination -</b></p> <p><b>-Substitution -</b></p> <p><b>-Engineering Controls</b></p> <p>-Proper ventilation</p> <p>-Off the engine when not in use</p> <p>-Regular servicing of engines</p> <p>Localised noise barriers, hoardings, screen walls</p> <p>-Fire extinguishers</p> <p><b>Administrative Controls-</b></p> <p>- Only trained personnel are allowed</p> <p>-Subdue the dust, damp the ground</p> <p>-Correct body posture</p> <p>-Job rotation</p> <p>-No smoking / naked lights</p> <p>-SDS briefing</p> <p>-Regular intake of water to cool the body</p> <p>-Sufficient rest</p> | 5 | 1 | 5   | NIL                 | 5 | 1 | 5   | Site Supervisor<br><br>WSHC<br><br>Traffic Controller | 21/09/19 |         |

| Hazard Identification |                     |   | Risk Evaluation                          |  |   |   |     |                     |   |   |     | Risk Control  |          |         |
|-----------------------|---------------------|---|--|--|---|---|-----|---------------------|---|---|-----|---|----------|---------|
| Ref                   | Work Activity       | Hazard  | Possible Accident or Injury & Ill health | Existing Risk Controls   | S | L | RPN | Additional Controls | S | L | RPN | Implementation Person                                 | Due Date | Remarks |
|                       |                     |   |  | -Follow RA/SWP<br><br><b>-PPE</b><br><br>Helmet, safety shoe/full body harness, goggle, gloves & Etc.  |   |   |     |                     |   |   |     |   |          |         |
| 7                     | Housekeeping        | Loose materials, Debris                       | Cut, laceration, Body injuries           | <b>-Elimination -</b><br><b>-Substitution -</b><br><b>-Engineering controls</b><br><br>Cordon off the area<br><br><b>Administrative Controls</b><br><br>- Daily housekeeping<br><br>- Regular reminders on housekeeping<br><br>-Clearing of grease and oils immediately after spilling<br><br><b>PPE</b><br><br>Helmet, safety shoe/full body harness, goggle, gloves & Etc. | 5 | 2 | 10  | NIL                 | 5 | 1 | 5   | Site Supervisor<br><br>WSHC                           | 21/09/19 |         |
| 8                     | Emergency Situation | Vehicle ram in to the structure, topple, Fire | Serious injury or fatality               | <b>Elimination –</b><br><b>Substitution</b><br><b>Engineering Controls</b><br><br>- Regular maintenance, Inspection<br><br>-Stable access  | 5 | 1 | 5   | NIL                 | 5 | 1 | 5   | Site Supervisor<br><br>WSHC<br><br>Traffic Controller | 21/09/19 |         |

| Hazard Identification |               |   | Risk Evaluation                          |   |   |   |     |                     |   |   |     | Risk Control  |          |         |
|-----------------------|---------------|---|--|---|---|---|-----|---------------------|---|---|-----|---|----------|---------|
| Ref                   | Work Activity | Hazard  | Possible Accident or Injury & Ill health | Existing Risk Controls  | S | L | RPN | Additional Controls | S | L | RPN | Implementation Person                                 | Due Date | Remarks |
|                       |               |   |  | <b>Administrative Controls</b><br><br>- Pre checks of limit switches , brakes, access, latches and other devices<br><br>-No overloading<br><br>-No damaged materials used<br><br>-No horseplay<br><br>-Regular housekeeping<br><br>-Flammable liquids stored in proper manner<br><br>-No refuelling of fuel while engine on<br><br>-No smoking on site<br><br>- RA&SWP briefed and followed<br><br>-Effective supervision<br><br><b>PPE-</b><br><br>Helmet, safety shoe/full body<br><br>harness, goggle, gloves & Etc. |   |   |     |                     |   |   |     |   |          |         |
| 9                     | Human factor  | Operators/workers not following SWP, In-house rules and regulation, Personnel hygiene, Alcohol consumption. | Injuries, fatal ,Property damage         | <b>Elimination</b><br><br><b>Substitution</b><br><br><b>Engineering Controls</b><br><br><b>Administrative Controls</b>  | 5 | 1 | 5   | NIL                 | 5 | 1 | 5   | Site Supervisor<br><br>WSHC<br><br>Traffic Controller | 21/09/19 |         |

| Hazard Identification |               |        | Risk Evaluation                          |  |   |   |     |                     |   |   |     | Risk Control          |          |         |
|-----------------------|---------------|--------|--|--|---|---|-----|---------------------|---|---|-----|-----------------------|----------|---------|
| Ref                   | Work Activity | Hazard | Possible Accident or Injury & Ill health | Existing Risk Controls   | S | L | RPN | Additional Controls | S | L | RPN | Implementation Person | Due Date | Remarks |
|                       |               |        |  | -Safety induction course for all workers and drivers.<br>-Regular reminders<br>-Periodical refresher training<br>-Daily tool box meeting<br>- Proper supervision |   |   |     |                     |   |   |     |                       |          |         |

**Severity**

**Likelihood**

**Risk / Impact Level**

| Level | Severity     |
|-------|--------------|
| 5     | Catastrophic |
| 4     | Major        |
| 3     | Moderate     |
| 2     | Minor        |
| 1     | Negligible   |

| Level | Classification |
|-------|----------------|
| 1     | Rare           |
| 2     | Remote         |
| 3     | Occasional     |
| 4     | Frequent       |
| 5     | Almost certain |

|                  | Rare (1) | Remote (2) | Occasional (3) | Frequent (4) | Almost Certain (5) |
|------------------|----------|------------|----------------|--------------|--------------------|
| Catastrophic (5) | 5        | 10         | 15             | 20           | 25                 |
| Major (4)        | 4        | 8          | 12             | 16           | 20                 |
| Moderate (3)     | 3        | 6          | 9              | 12           | 15                 |
| Minor (2)        | 2        | 4          | 6              | 8            | 10                 |
| Negligible (1)   | 1        | 2          | 3              | 4            | 5                  |

1 to 3 – Low Risk    4 to 12 – Medium Risk    15 to 25 – High Risk



## Annex C – Common Site Traffic-related Hazards and Control Measures

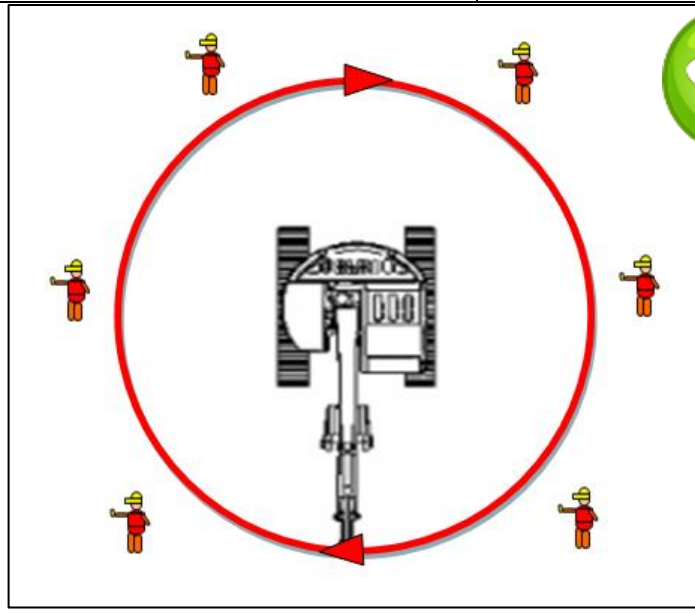
| Hazard   | Risk Control Measures   |
|--|---|
| Workers unaware or have reduced awareness of traffic safety. | Supervisor to conduct daily toolbox meeting to the drivers/ operators |



| Hazard   | Risk Control Measures  |
|--|--|
| No dedicated personnel to manage traffic flow especially with many stakeholders. | Establish a competent traffic control team with adequate PPEs. |



| Hazard  | Risk Control Measures   |
|---|---|
| Work teams working in the vicinity of each other. | Traffic control team ensures that adequate clearance distance is maintained as the machinery travels within the site. |



| Hazard  | Risk Control Measures   |
|---|---|
| Untrained and incompetent traffic controller. | Competent traffic controller trained by Approved Training Provider such as SCAL Academy |



| Hazard                             | Risk Control Measures                           |
|------------------------------------|---|
| Untrained and incompetent drivers. | Drivers to be competently trained and assessed. |



| Hazard                           | Risk Control Measures  |
|----------------------------------|--|
| Vehicle not properly maintained. | <p>Ensure vehicles go through regular maintenance regime as prescribed in the servicing manuals.</p> <p>Ensure that daily pre-operational checks be done prior to usage of the vehicle using prepared checklist such as the one shown in the below sample.</p> |



Sample Daily Pre-operational Checklist

Vehicle plate number : \_\_\_\_\_  
 Vehicle model : \_\_\_\_\_  
 Date of inspection : \_\_\_\_\_  
 Driver's name : \_\_\_\_\_

| Description  | Yes | No |
|--|-----|----|
| <b>Fluid level within manufacturers' specifications</b>        |     |    |
| Engine oil level   |     |    |
| Brake fluid level  |     |    |
| Radiator fluid level   |     |    |
| Battery water level  |     |    |
| Window washer water level                                      |     |    |
| Fuel level   |     |    |
| Windscreen washer level  |     |    |
| <b>Lights are in working condition</b>                         |     |    |
| Headlights (high beam)   |     |    |
| Headlights (low beam)  |     |    |
| Licence plate  |     |    |
| Reverse  |     |    |
| Cabin interior   |     |    |
| Brake indicator  |     |    |
| Hazard   |     |    |
| Indicator turn signals   |     |    |
| <b>Ensure the following are adjusted to suit driver's view</b> |     |    |
| Driver seat  |     |    |
| Rear view mirror   |     |    |
| Side mirrors   |     |    |
| <b>Pedals</b>  |     |    |
| Foot brake holds, stops vehicle smoothly                       |     |    |
| Parking brake holds against slight acceleration                |     |    |
| Clutch and gearshift shift smoothly without jerking            |     |    |

| Description  | Yes | No |
|--|-----|----|
| <b>Tyres</b>   |     |    |
| Inflated and free of excessive wear or damage.                                 |     |    |
| Nuts are tight.  |     |    |
| Adequate thread.   |     |    |
| Check spare tyre (i.e., inflated and no visible cracks).                       |     |    |
| <b>Ensure the following are in working condition (others):</b>                 |     |    |
| Seat belts are working and free of damage.                                     |     |    |
| Mirrors are clean and no visible damages.                                      |     |    |
| Doors and door locks operate correctly.  |     |    |
| Dash control panel are fully operational (i.e., all lights and dashes).        |     |    |
| Steering wheel moves smoothly.   |     |    |
| Horn is loud and clear.  |     |    |
| Vehicle reverse alarm (if fitted) is working.                                  |     |    |
| Hydraulic systems are operating smoothly (i.e., no visible leaks and systems). |     |    |
| All loads (if any) are secured.  |     |    |
| Reverse warning buzzer is working.   |     |    |

If you answer **No** to any of the above, state the condition(s) and its respective corrective actions.

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Driver's signature/ Date:

Supervisor's signature/ Date:

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| Hazard | Risk Control Measures |
|--------|-----------------------|
|--------|-----------------------|

Using hand phone while driving

Site supervisor to ensure the driver / operator no usage of hand phone while driving.



| Hazard | Risk Control Measures |
|--------|-----------------------|
|--------|-----------------------|

Not buckling up the seat belt during driving/ operating vehicle/ machinery

a. Secure seat belts (if applicable) before driving/ operating.  
 b. Equip with warning device when seat belt is not deployed.



| Hazard | Risk Control Measures |
|--------|-----------------------|
|--------|-----------------------|

Vehicle running down on slope due to inadequate parking.

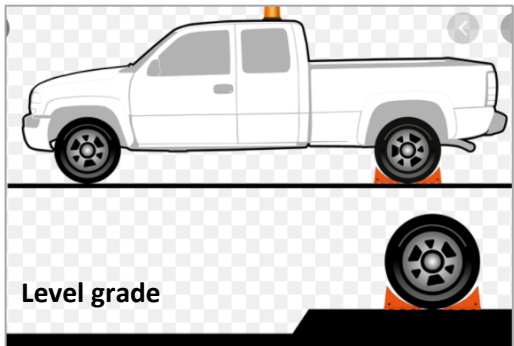
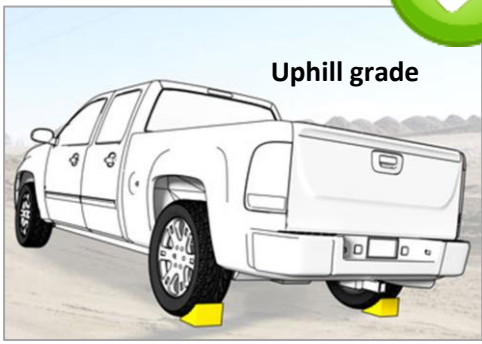
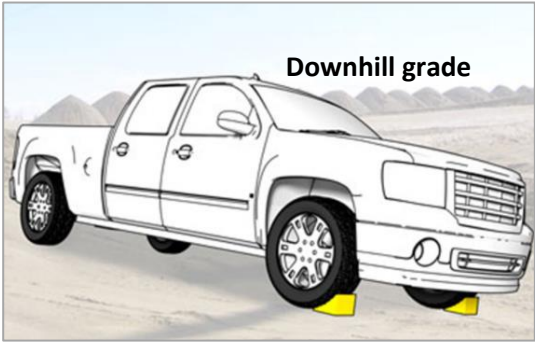
Wheel chocks should be used in pair and placed centrally and squared with the tire.

On a downhill grade, position the chocks in front of the front wheels.

On an uphill grade, position the chocks behind the rear wheels.

On a level grade, position the chocks on the front and back of a single wheel.

**Use handbrake and wheel chocks when parking.**



| Hazard | Risk Control Measures |
|--------|-----------------------|
|--------|-----------------------|

|   |   |
|---|---|
| Tall vehicle travelling in places with height restrictions. | Additional Gantry Height Warning System |
|---|---|



**Additional Gantry Height Warning System**

- Provide additional height warning system
- Restricts height of vehicles
- Prevents damages to site gate and vehicles over the height limit

| Hazard | Risk Control Measures |
|--------|-----------------------|
|--------|-----------------------|

|                      |   |
|----------------------|---|
| Inadequate lighting. | Provide adequate lighting resources to improve visibility |
|----------------------|---|





| Hazard | Risk Control Measures |
|--------|-----------------------|
|--------|-----------------------|

Inadequate illumination.

Driver to turn on head lights and hazard lights during the time when illumination is poor



| Hazard | Risk Control Measures |
|--------|-----------------------|
|--------|-----------------------|

Speeding by drivers.

Drivers to adhere to the stated speed indicated at site.



Drive within the workplace speed limit.



**Vehicular Speed Detector**

Provide speed detector along vehicular access

- Reminds drivers to be wary of their vehicle's speed
- Reduces tendency of speeding

| Hazard | Risk Control Measures |
|--------|-----------------------|
|--------|-----------------------|

Pedestrian/ cyclist coming into path of truck coming out from the workplace.

Provide rotating light with sounding alarm to warn pedestrian/ cyclist each time a truck is coming out from the workplace.



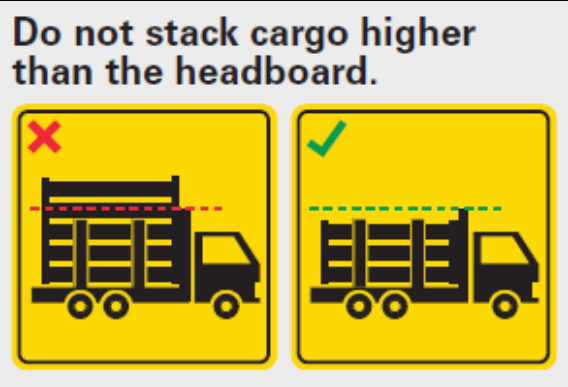
| Hazard | Risk Control Measures |
|--------|-----------------------|
|--------|-----------------------|

Unsecured or improperly lashed loads falling from travelling vehicles.

Ensure effective lashing of goods done before moving the vehicle.



| Hazard  | Risk Control Measures                                 |
|---|---|
| Stacking of materials on truck above its headboard resulting in an unsafe situation that may result in vehicle toppling or material spillage. | Material not to be stacked higher than the headboard. |



| Hazard  | Risk Control Measures   |
|---|---|
| Blind spots causing truck drivers not able to see any other stakeholders that may be in the path of the moving vehicle. | <ol style="list-style-type: none"> <li>1. Provide aids such as mirrors to enable drivers to overcome blind spot areas.</li> <li>2. Provide warning label on Danger Blind Spot to warn any stakeholders in the vicinity to stay clear from the truck.</li> </ol> |







| Hazard   | Risk Control Measures   |
|--|---|
| <p>No provision of dedicated and proper:</p> <ol style="list-style-type: none"> <li>1. Pedestrian walkway</li> <li>2. Worker rest area</li> <li>3. Work zone</li> </ol> <p>resulting in conflict zones between worker and vehicle movements.</p> | <ol style="list-style-type: none"> <li>1. To provide dedicated, safe and proper rest areas and walkway for workers to ensure movement of workers are contained.</li> <li>2. Cordon off work zone from traffic.</li> </ol> |

**Use designated pedestrian walkways.**



**Cordon off work zone from traffic.**





## Annex D – Sample Safety Time Out Checklist for Workplace Traffic Management

This checklist provides the basic requirements for workplace traffic management. Should a “No” be recorded for any of the below checklist items, state the condition(s) and its respective corrective actions in the “Remarks” column. This checklist is non- exhaustive and users are recommended to make the necessary customisation to suit your work processes and conditions at the workplace.

| S/N   | Items   | Circle whichever applicable |    | Remarks |
|---|---|-----------------------------|----|---------|
| <b>A. Workplace, traffic layout, traffic routes and pedestrian walkways</b> |   |                             |    |         |
| 1   | Are roads and walkways suitable for the types of vehicular traffic and pedestrian traffic?  | Yes                         | No |         |
| 2   | Are surfaces of roads and walkways slip-resistant?  | Yes                         | No |         |
| 3   | Are transport vehicles and pedestrians kept safely apart?   | Yes                         | No |         |
| 4   | Are roads, walkways and parking areas marked properly according to the traffic management plan?   | Yes                         | No |         |
| 5   | Are lighting levels sufficient in the pedestrian areas and for vehicle activity?  | Yes                         | No |         |
| 6   | Do transport vehicles traffic routes have firm and even surfaces?   | Yes                         | No |         |
| 7   | Are traffic routes for transport vehicles and pedestrian walkways free from obstruction and other hazards?  | Yes                         | No |         |
| 8   | Are traffic routes marked properly?   | Yes                         | No |         |
| 9   | Are standard traffic signs installed at necessary locations?  | Yes                         | No |         |
| 10  | Are convex mirrors (to provide greater vision at blind bends), road humps (to reduce transport vehicles speeds), or barriers (to keep transport vehicles and pedestrians apart) provided where necessary? | Yes                         | No |         |
| 11  | Are traffic routes wide enough?   | Yes                         | No |         |
| 12  | Is the width of the passageways wide enough?  | Yes                         | No |         |
| <b>B. Training</b>  |   |                             |    |         |
| 13  | Has the driver or employee gone through the company’s safety induction course?  | Yes                         | No |         |
| 14  | Has the driver or employee gone through the company refresher training for drivers (if applicable)?   | Yes                         | No |         |

| S/N                             | Items  | Circle whichever applicable | Remarks |
|---------------------------------|--|-----------------------------|---------|
| 15                              | Does the driver have a valid license and experience to operate the powered vehicle?  | Yes No                      |         |
| 16                              | Has the signalman or banksman been trained to guide the manoeuvring transport vehicles?  | Yes No                      |         |
| <b>C. Traffic or operation</b>  |  |                             |         |
| 17                              | Are suitable transport vehicles and attachments chosen for the tasks to be carried out?  | Yes No                      |         |
| 18                              | Have any observations been made of drivers who do not obey the traffic rules (e.g., use the correct routes or drive within the speed limit) and operate their transport vehicles safely? | Yes No                      |         |
| 19                              | Do managers/ supervisors/ drivers/ signalmen/ banksmen/ employees wear the PPE provided (e.g., visibility vests)?  | Yes No                      |         |
| 20                              | Do drivers carry out pre-operation checks before actual operation?   | Yes No                      |         |
| 21                              | Are personnel cleared of the areas before reversing the powered vehicle?   | Yes No                      |         |
| 22                              | Is there a signalman or banksman provided to guide the manoeuvring transport vehicles (if applicable)?   | Yes No                      |         |
| 23                              | Does the signalman or banksman position themselves at a safe position?   | Yes No                      |         |
| 24                              | Are transport vehicles parked on level ground (wheels chocked, if applicable) with their parking brakes on and the ignition key removed?   | Yes No                      |         |
| <b>D. Loading and unloading</b> |  |                             |         |
| 25                              | Are loading or unloading operations carried out in an area away from passing traffic and pedestrians?  | Yes No                      |         |
| 26                              | Are the appropriate vehicle(s) used for loading or unloading?  | Yes No                      |         |
| 27                              | Are loading or unloading activities carried out on ground that is flat, firm and free from potholes?   | Yes No                      |         |
| 28                              | Are parking brakes used to prevent unwanted movement (e.g., when coupling transport vehicles)?   | Yes No                      |         |
| 29                              | Are the transport vehicle's brakes and/or stabiliser used to prevent unsafe movements during loading and unloading operations?   | Yes No                      |         |

| S/N                                  | Items  | Circle whichever applicable | Remarks |
|--------------------------------------|--|-----------------------------|---------|
| 30                                   | Do the lifting equipment, appliance or gears used for (un)loading transport vehicles possess valid statutory inspection certificate(s)?                  | Yes No                      |         |
| 31                                   | Is loading or unloading carried out such that the load is spread evenly to avoid the powered vehicle or trailer from becoming unstable?                  | Yes No                      |         |
| 32                                   | Are checks made to ensure that the load is adequately secured and not over-loaded before the powered vehicle leaves the workplace?                       | Yes No                      |         |
| 33                                   | Are there any unsafe act observed during loading or unloading?   | Yes No                      |         |
| 34                                   | Do employees follow safe work procedures when (un)coupling, (un)loading and securing loads, and so on?   | Yes No                      |         |
| <b>E. Management and Supervision</b> |  |                             |         |
| 35                                   | Are workplace traffic rules documented and distributed?  | Yes No                      |         |
| 36                                   | Are managers/ supervisors/ drivers/ signalmen/ banksmen/ employees and others, including contractors and visitors, aware of the workplace traffic rules? | Yes No                      |         |
| 37                                   | Has risk assessment been conducted for work activities and communicated to all concerned personnel prior to operation?                                   | Yes No                      |         |
| 38                                   | Has action been taken when the workplace's traffic rules (if any) are violated?  | Yes No                      |         |
| <b>F. Maintenance</b>                |  |                             |         |
| 39                                   | Are roads and walkways suitable for the types and volumes of vehicular traffic and pedestrian traffic?   | Yes No                      |         |
| 40                                   | Are transport vehicles and pedestrians kept safely apart?  | Yes No                      |         |
| 41                                   | Are there adequate parking places for all parking needs?   | Yes No                      |         |
| 42                                   | Is the level of lighting sufficient for vehicular and pedestrian traffic?  | Yes No                      |         |
| 43                                   | Do powered vehicle traffic routes have firm and even surfaces?   | Yes No                      |         |
| 44                                   | Are vehicular and pedestrian traffic free from obstructions and other hazards?   | Yes No                      |         |



| S/N | Items  | Circle whichever applicable | Remarks |
|-----|--|-----------------------------|---------|
| 45  | Are traffic routes arranged to avoid sharp or blind turns?   | Yes No                      |         |
| 46  | Are traffic routes marked properly according to the traffic management plan?   | Yes No                      |         |
| 47  | Are standard traffic signs installed at necessary locations?   | Yes No                      |         |
| 48  | Are convex mirrors (to provide greater vision at blind bends), road humps (to reduce powered vehicle speeds), or barriers (to keep transport vehicles and pedestrians apart) provided where necessary? | Yes No                      |         |
| 49  | Are the passageways wide enough?   | Yes No                      |         |