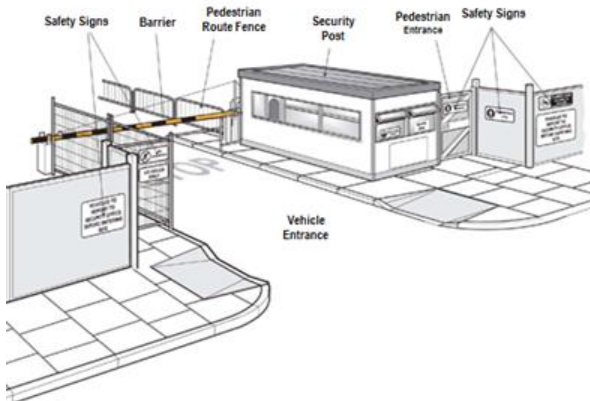


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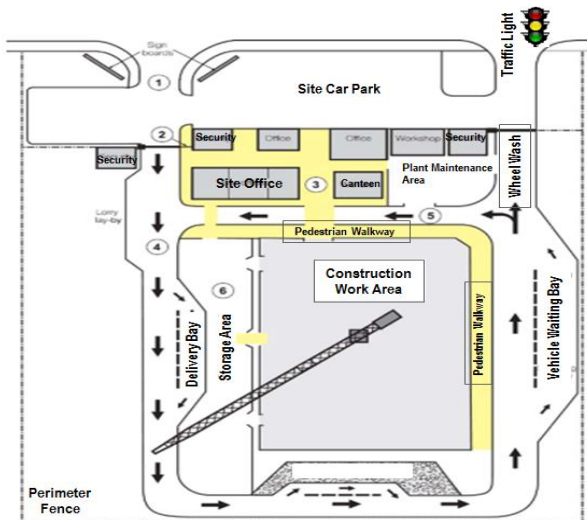
GMR 4.3	Vehicle and Plant Incident (Work Sites) 								
Description: These critical controls and performance standards apply to the operation and movement of all vehicles in defined construction zones and include heavy equipment and fixed and mobile plant where the impacts of an event could result in a fatality. It does not cover traffic on Lendlease assets (e.g. retail, residential or commercial) or the use of Lendlease light vehicles on public roads.									
<i>All applicable local, national and international environment, health and safety legislation and recognised codes, standards and other external requirements must always be complied with. Where there is a difference between Lendlease Standards and those required by legislation recognised codes, standards and other external requirements the higher standard must be applied.</i>									
GMR Subsection:	4.3.1 Traffic Management								
Controls: Vehicle routes on construction and haul roads must effectively manage the risks to vehicles and people. Performance Standards: i) Traffic management plans must address the interface with public roads and provide effective controls addressing prohibited vehicles, height and weight restrictions, path of travel, access points, pedestrian access routes, routes for different vehicles or plant, reversing requirements, signs and traffic control aids, technology application, site traffic maintenance and protected position(s) of the traffic controllers ensuring an escape route is available in the event of an emergency. ii) Traffic management or vehicle movement plans must be current and define the engineering controls to prevent vehicles striking another vehicle, structure or pedestrian. iii) Separate traffic plans are needed for each stage and area of the operation when the discrete phases of work result in changes to the operating and traffic environment. iv) Vehicle routes must facilitate the safe movement of the types of vehicles and levels of traffic likely to use them. This must be achieved by avoiding hazards such as steep inclines, tight bends, requirements to reverse in confined areas, inadequate lane widths and any issues related to roundabouts, one-way routes and signage. v) Regular inspections are required to determine that the implementation of the controls is consistent with the traffic management plan, have not been altered or changed or degraded in condition over time.									
General Requirements									
Methodology									
1. Eliminate vehicle related risks by pre-planning good site access, signage and separation of pedestrian and vehicular traffic 2. Implement measures to prevent the risk of vehicle collisions as well as collision of vehicles with people 3. Warnings to drivers and pedestrians (audible/visual/physical) 4. Each operation must document and keep an updated Traffic Management Plan in-cooperating various stages of the project prior to commencement and as a minimum must include details of the following: <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">a) Entrance and access control</td><td style="width: 50%;">e) Entrance and access control</td></tr> <tr> <td>b) Pedestrian routes</td><td>f) Pedestrian routes</td></tr> <tr> <td>c) Crossing points</td><td>g) Crossing points</td></tr> <tr> <td>d) Identification of hazards</td><td>h) Identification of hazards</td></tr> </table> 5. All Traffic Management Plans must be reviewed and approved by a Competent Person. 6. A designated points for loading unloading out from the vehicle routes and a one way traffic must be established where ever possible. 7. Use of available traffic management controls such as traffic lights, speed bumps, speed limits, etc. must be explored to minimise the use of traffic controllers.		a) Entrance and access control	e) Entrance and access control	b) Pedestrian routes	f) Pedestrian routes	c) Crossing points	g) Crossing points	d) Identification of hazards	h) Identification of hazards
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b) Pedestrian routes	f) Pedestrian routes								
c) Crossing points	g) Crossing points								
d) Identification of hazards	h) Identification of hazards								
Delivery									
1. Regular inspections shall be scheduled to determine the traffic manaement plan is still current and applicable to the traffic conditions.									

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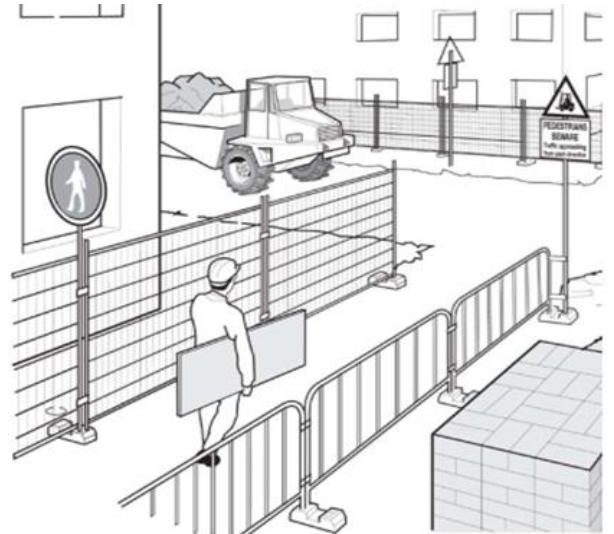
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Examples of access control and entrance setup



Example of operation specific traffic management plan



Pedestrian and vehicle segregation and crossing points

GMR Subsection: 4.3.2 Pedestrian and Vehicle Segregation

Controls: All operations must assess the risks presented by the movement of pedestrians, materials and vehicles and implement appropriate safety measures to eliminate or minimise these risks.

Performance Standards:

- Pedestrians are to be separated from dedicated vehicle, plant and equipment routes by appropriate physical barriers designed to mitigate any potential impacts.
- Light and heavy equipment and plant must be separated using appropriate measures such as physical barriers or earth berms and demarcated using visible signage indicating routes and directions to prevent interaction.
- Activities such as plant maintenance or refuelling must be undertaken in areas specifically designed to provide barriers between workers and other heavy equipment.
- Route sightlines must be unobstructed and adequately lit to provide good visibility. Blind spots and corners are to be avoided, or where they do exist, have mirrors installed or other technology installed that effectively eliminate sight restrictions. Plant, equipment or materials must not be placed at vehicle entries/exits to operations and therefore creating obstructed route sightlines.
- Signage and road markings must provide clear instructions to pedestrian and vehicle route users and be located in positions which allow users to see them and have time to respond. Signs and road markings must be constructed and located so as not to present hazards to drivers or pedestrians.
- Loading and unloading areas must be clearly defined. These areas must be separate from parking or access routes for private vehicles and away from pedestrian routes. If reversing cannot be eliminated, then it must be controlled by establishing pedestrian exclusion zones.
- Speed limits must be set to reduce the risks associated with pedestrian movements. Speed calming measures such as raised crossings, humps on approach to crossings and rumble strips must be implemented in areas where pedestrians and vehicles could interface.
- Construction sites must provide separate site entrance and exit points for pedestrians and vehicles. When vehicles and pedestrians are in close proximity due to nearby locations such as security entrance points or where doors open

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directly onto vehicle routes, engineering controls must be provided to keep pedestrians and vehicles apart (e.g. by fitting physical barriers or providing separate routes).

- ix) The use of people as traffic signallers must be eliminated wherever possible, particularly around heavy equipment operations. Where the use of people as traffic signallers are required such as for pedestrian access areas or to manage public road interface, only trained traffic signallers are to be used. In these instances, a risk assessment must be undertaken to identify where technology can be implemented to replace or remove the spotter. Any traffic signallers must have a designated safe zone to stand in whilst directing traffic movements.
- x) Implement safety measures where work is undertaken next to active roads, train lines or similar, to protect workers from impacts with moving vehicles, trains or associated debris. For large sites, physical barriers or truck mounted attenuators must be used to protect workers from road traffic. Where this cannot be achieved, low speed limits must be in place (less than or equal to 40km per hour [25mph]) in combination with traffic calming measures, hazard signage, demarcation lines and barriers to minimise risk for workers and the public.

General Requirements

Methodology

1. Pedestrians and vehicles must be separated and routes clearly signposted to guide pedestrians through the site.
2. Where persons and plant may interact, physical hard barriers/safe zones are to be erected to ensure clear and safe separation.
3. Designated areas to be established for plant and machinery maintenance and refuelling. Such areas need to be provided with proper hard barriers to prevent workers contact with other moving vehicles
4. Fencing/hoarding or handrails must be positioned to create clear access along the pathway.
5. Road crossings are to be positioned to maximise the pedestrian's view of approaching traffic and to be clear of obstructions that would block the driver's viewpoint of the crossing.
6. Convex mirrors to be installed to aid visions around blind spots. Adequate signage and speed breakers / bumps also to be considered for such areas.
7. Traffic signallers are to be provided with a designated safe zone to stand while directing traffic.

Delivery

1. Pedestrian routes are to be clear of materials, free from trip hazards and adequately lit.
2. Road crossings are to be clearly marked and signposted for pedestrian and vehicles.
3. Adequate lightings to be provided for all the walkways and road crossings
4. Where traffic signallers assigned, they must be trained on their respective operations. They must be also differentiated from other work forces i.e by wearing different colour vest.
5. Speed bumps to be used to slow down vehicles before approaching hazard or pedestrian crossing areas.
6. Signage must be clear and informative to warn both pedestrian and vehicle of the hazards, convey site rules, speed limits and guidance on traffic safety.
7. Sufficient lighting must be provided to ensure that any hazard or hazard area is highlighted in poor lighting conditions.
8. Barriers must be placed around hazards to prevent personnel or vehicles coming into contact with the hazard.



Controls in place to manage pedestrian and vehicle crossing points



Barriers and guardrails erected to form separated pedestrian routes

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Segregation between light and heavy vehicles



Clearly marked pedestrian road crossing



Speed bump and clear signage used to slow down vehicles approaching hazard areas



Warring sign to inform drivers of the presence of a designated road crossing; convex mirror to aid vision around road corner



Minimise use of traffic controllers and replace with technology-based solutions



Use of traffic /portable lights versus traffic controllers at construction exit points

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Example of truck mounted attenuator for external works



Barriers to prevent contact with pedestrian and vehicles

REMEMBER

“KEEP MACHINES CLEAR OF PEOPLE AND PEOPLE CLEAR OF MACHINES”

GMR Subsection: 4.3.3 Parking and Traffic Routes

Controls: Traffic routes and parking arrangements must be in place to avoid vehicle-to-vehicle and vehicle-to-pedestrian conflict.

Performance Standards:

- i) Provide clear signage in carparks, along traffic routes and foot traffic areas to indicate location information, speed limits, hazards and precautions.
- ii) Provide clearly defined pedestrian routes in safe zones using hard barriers, flagging and other visual delineation to facilitate safe access and egress.
- iii) Locate height bars and signage to entrances to warn drivers of any applicable height limits. Provide safe exit routes for oversized vehicles.
- iv) Where amenities are provided, delineated stable, weather-resistant car parking must be provided.

General Requirements

Methodology

1. Where space permits and there is a need, weather-resistant car parks shall be established within, or close to, the operation premise.
2. Where practicable, staff and visitor parking shall be adjacent to the site offices and minimise any need to cross roadways or site access points.
3. Private vehicles are to have a separate parking area to construction and delivery vehicles. No private cars will be allowed to park in the construction zone or on site access roads.
4. Where parking areas are located within the site, routes to site offices must be clearly signed at entry points and directional signage provided.

Delivery

1. Parking zones shall be clearly identified with signage and have adequate lighting to all parking areas.
2. Motorcycle and bicycle parking facilities shall be provided at site entry point where required.
3. Speed limits need to be established and clear signage to be posted all around the site and parking areas.
4. Carpark walkways need to be clear from any tripping hazards and provides a clear safe access and egress.

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Designated on-site car park



Dedicated parking space provided for motorcycles



Example of height limit barriers



Example of provision of dedicated bicycle racks

GMR Subsection: 4.3.4 Use of Light Vehicles on Site

Controls: Lendlease tool of trade vehicles operating in defined construction zones must be in good working order and operated in a safe manner.

Performance Standards:

- i) Vehicles used as a tool of trade by Lendlease personnel must be operated in a safe manner at all times.
- ii) Light vehicles on operations must be of a high visibility colour (e.g. white) and have reflective taping, flashing lights, a first aid kit, a fire extinguisher, a spill kit and survival or emergency equipment suitable for the operating environment.
- iii) Vehicles proposed for hire or purchase must have a recognised national new car safety rating (e.g. five-star Australasian New Car Assessment Program (ANCAP) rating or equivalent national standard).
- iv) Vehicles provided by Lendlease as a tool of trade shall be fitted with in-vehicle management systems, reversing cameras and hand brake warning systems.
- v) Seatbelts must be used at all times by all occupants and drivers of vehicles whilst the vehicle is moving.
- vi) Mobile phones must only be used by the driver of a tool of trade vehicle whilst the vehicle is stationary and in a parked safe location. The exception to this is for emergency and incident response vehicles, using hands free communications in a response situation, where alternative communication methods are not available.
- vii) All drivers must be appropriately licensed for the vehicle being operated.
- viii) Drivers must be fit for work (i.e. not affected by medication, drugs or alcohol).
- ix) When parked, all vehicles must be fundamentally stable (i.e. the vehicle will not move even with the vehicle in neutral and with no brakes applied) with the handbrake effectively applied, placed in gear and on level ground. Wheels must be situated in spoon drains, gutters or against wheel stops. If fundamentally stable parking cannot be achieved appropriately sized wheel chocks must be available and implemented.
- x) All Lendlease vehicles must have inspection and maintenance protocols in place for all safety related items such as wheels and tyres, steering, suspension and braking systems, seats and seat belts, lamps, indicators, mirrors and reflectors, windscreen and windows including windscreen wipers and washers, the vehicle structure itself and any other safety related item on the vehicle body, chassis or engine including instrumentation.
- xi) Pre-start inspections must be completed to determine that the lighting and braking systems are in proper working order.

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- xii) Vehicles must not be used above the manufacturer defined maximum load limit and loads must be suitably restrained so the load remains stable on the vehicle during normal driving conditions. Loads must not protrude from the vehicle in a way that could injure people, damage property or obstruct others' paths.
- xiii) Wheel nut indicators must be fitted to all vehicle wheels where not precluded by the design.

General Requirements

Methodology

1. A designated person is to be assigned to monitor and ensure all LL vehicles are in compliance to the GMR4.3.4.
2. Where light vehicles are in use a vehicle register needs to be established and updated by the respective operations.
3. A proper maintenance and inspection regime specifically for all safety related items such as wheels and tyres, steering, suspension and braking systems, seats and seat belts, lamps, indicators, mirrors and reflectors, windscreen and windows including windscreen wipers and washers, the vehicle structure itself and any other safety related item on the vehicle body, chassis or engine including instrumentation in addition to the manufacturers recommendations need to be established and records are kept in file.

Delivery

1. Pre-Start inspections checklists for visual inspection containing the above safety related items must be established and carried out by the users on daily basis prior to operate the vehicles.
2. All vehicle users must have a valid license for the types of vehicle they are operating and are responsible to ensure compliances to the requirements for safe operation. The vehicle users or drivers must also be ascertained to be fit for work.
3. Vehicles need to be taken out of operation and inspected by a competent person if any defects or conditions which could compromise safe operation of the vehicle observed at any time.
4. Where the trip expected to be more than 2 hours drive, the drivers to plan for adequate stops /breaks to manage fatigue.



Carry out daily pre-start check prior to any vehicle use

LIGHT VEHICLE PRESTART CHECKLIST		000001																																																																																																										
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Example of a light vehicle Pre-start Inspection Checklist



Example of wheel nut indicators



Place signage to remind drivers / operators to buckle up

GMR Subsection: 4.3.5 Use of Plant, Equipment and Vehicles

Controls: Effective controls must be in place for managing the use of all mobile plant, equipment and vehicles used for ground and civil works, including bobcats, excavators, backhoes, graders, scrapers, bulldozers, dump trucks, rollers and compactors.

Performance Standards:

- i) All mobile plant in use on Lendlease operations must have been subject to a risk assessment conducted by the supplier/manufacturer in accordance with regional legislation and codes or standards with the risk assessment

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remaining with the plant. Inspections must be conducted in accordance with regional legislation, codes or standards and the manufacturers recommendations.

- ii) Any modifications made to plant and equipment, such as retrofitting additional safety systems, must be completed by qualified persons and following consultation with the manufacturer to determine that any proposed changes will not introduce new risks.
- iii) Operating mobile plant and equipment must have seat belts for all occupants, adequate lighting (e.g. headlights, tail, turn, brake, strobe and flashing lights), identified isolation or lockout points, adequate walkways, railing, steps or grab handle combinations and boarding facilities. Where possible, mobile plant with alternative emergency egress from the cabin should be provided. Additional items such as reversing alarms, wheel chocks, a horn, a handbrake alarm and effective windscreen wipers must also be in place and functioning as intended.
- iv) Technological advances must be considered for collision avoidance, fatigue management, pedestrian proximity notification and visibility improvement, particularly where personnel are required to enter the potential impact zone of operating plant, vehicles and equipment.
- v) All mobile plant and equipment must have protection where there is a risk of rollover, tip over or impact by falling objects (e.g. loading or unloading, work on stockpiles or steep inclines, work below other material or activities or where manufacturer's specifications require it). Any modifications made to plant and equipment, such as retrofitting additional safety systems, must be completed by qualified persons and following consultation with the manufacturer to determine that any proposed changes will not introduce new risks.
- vi) Replace or re-certify protection equipment and fixtures after a rollover, tip over or falling object damage and before further use.
- vii) Prohibit the use of mobile phones when the plant or equipment is in use.
- viii) Protocols must be provided for the use of plant and equipment on slopes and batters to avoid vehicle rollovers. Technology solutions must be in place, where available, to provide warning for the potential of safe working angles to be exceeded or the loss of traction.
- ix) Clearly identify minimum clearance distances for overhead cables and establish controls to prevent plant or equipment coming into contact with these cables.
- x) If personnel are required to enter the potential impact zone of operating plant, vehicles and equipment without a physical barrier, positive eye contact, signals or radio contact must be made with the operator to cease operation and lower implements such as dipper arms, buckets and blades to the ground before entry.
- xi) Establish and maintain pedestrian exclusion zones around operating plant and equipment where there is a risk of workers being struck. Clearly identify specific exclusion zones for stationary but operating plant or equipment (e.g. an excavator with its bucket in use) for each type of plant or equipment and implement an appropriate exclusion zone, preferably a physical barrier.
- xii) When parked all plant and equipment must be fundamentally stable with the engine turned off, handbrake effectively applied, placed in gear and on level ground and secured from unauthorised use. Wheels must be situated in spoon drains, gutters or against wheel stops. Implements and attachments such as dipper arms, buckets and blades must be lowered to the ground. If fundamentally stable parking cannot be achieved appropriately sized wheel chocks or other controls (positioned in spoon drains) must be available.
- xiii) Vehicles (heavy or light) must not be used above the manufacturer defined maximum load limit and loads must be suitably restrained so the load remains stable on the vehicle. Loads must not protrude from the vehicle in a way that could injure people, damage property or obstruct others' paths.
- xiv) Mobile Elevated Work Platforms (MEWP's) should be fitted with secondary anti crush devices to guard against the potential crush risk of the operator between the MEWP & surrounding structure. These anti crush devices may be physical devices fitted to the MEWP or electronic limiting devices that stop movement when impending crush risk is detected. Where these devices are not supplied by the manufacturer of the MEWP, the device must be certified as being compliant by a suitably qualified and experienced person.

Pre-Construction Review

Methodology

1. Pre-construction review shall identify specific equipment that will be required throughout the construction period including any non-standard or long lead time equipment needing special order. Consideration shall also be given to selection of the plants and equipment whether the perceived plant or equipment for the operation is suitable to meet the requirements and conforms to site restrictions.
2. Procurement of Subcontractors/Trades/Plant Hire must be informed of special requirements at tender stage and included in tender package e.g. height restrictions, geo-survey reports, concrete kPA load limits, etc.
3. The Operation EH&S Risk Assessment and SWMS are to ensure that the correct type of vehicle is chosen for the work at hand.

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4. Use of available technologies for collision prevention, fatigue management and better visibilities need to be considered for all mobile plants and equipment.
5. Where applicable and possible, all bypass switches to isolate any emergency or safety systems / devices **shall** be removed or protected from access by the operators prior to the machine delivered to site.
6. All vehicles must be road worthy and registered with the respective authorities as per local requirements.

General Requirements

Methodology

1. All Lendlease Operations must develop and implement an effective plan that describes the measures to manage the use of all plant and equipment.
2. All plant and equipment must only be used for the purpose for which it was designed and in line with manufacturer's instructions.
3. Where the risk of roll over or tip over exists (e.g. loading/unloading, work on stockpiles or steep inclines, work below other material or activities, etc.), a detailed risk mitigation plan must be developed and put in place to ensure stability of the plant e.g. auxiliary removable counterweights. Seat belts must also be fitted to protect the driver/operator in the event the vehicle/plant rolls over.
4. In the event of a roll over, tip over or falling objects damage, the protection must be re-certified or replaced before further use.
5. The existence of public utility apparatus e.g. gas, water, electricity, sewers, overhead cables, etc. and the presence of pipelines must be thoroughly checked and the protection of such apparatus and the safety of plant operatives addressed with proper preventative measures initiated and implemented.
6. Any overhead cable shall be considered to be an energised line unless and until the person owning such line or the local electrical utility authorities indicate that it is not an energised line and it has been visibly grounded. Where an overhead cable is present in the vicinity of the operation, effective controls must be implemented to prevent the plant from coming into contact with the cables.
7. A person must be designated to observe clearance of the plant or equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.
8. No modifications or additions which affect the capacity or safe operation of the plant or equipment shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, or tags must be changed accordingly. In no case must the original safety factor of the equipment be reduced.

Delivery

1. All mobile plant shall be fitted with:
 - Appropriate fall protection to provide safe access (e.g. built-in ladders, steps, stairs, etc. with handrails affixed), and safe working location for inspections and maintenance (e.g. guardrails);
 - Appropriate visual and audible warning devices installed, i.e. flashing beacon lights and horns;
 - Air-conditioned cabin;
 - Cab glass that is of safety glass quality or equivalent, and that introduces no visible distortion affecting the safe operation of the plant;
 - Seat belts as required for the operators when seated in the normal seating arrangement; and
 - Overhead protection that will not obscure the vision of the operator
2. Prior to the commencement of any operation requiring the use of mobile plants and equipment, the Lendlease Team shall ensure that all personnel of the operation crew (plant or equipment operators, banksmen, signallers, etc.) are appropriately trained and skilled, and assessed to have the necessary experience and appropriate behaviour to carry out the operation.
3. Combustible and flammable materials must be removed from the immediate area prior to operations.
4. All earthmoving equipment shall have a service braking system capable of stopping and holding the equipment fully loaded.
5. Whenever a plant or equipment is parked, the parking brake must be set and the wheels chocked, and the plant stabilised.
6. Proper wheel-stoppers or stop logs must be provided to prevent plants, lorries, dumpers, etc. reversing into a dangerous position.
7. All moving parts of a plant or equipment must be fitted with appropriate guarding or physical barriers to prevent unintended access and contact with the moving part.

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8. Heavy machinery, equipment, etc. which are suspended or held aloft by use of slings, hoists, or jacks must be substantially blocked or cribbed to prevent falling or shifting before operatives are permitted to work under or between them. Bulldozer and scraper blades, end-loader buckets, dumper trucks, and similar equipment, must be either fully lowered or blocked when being repaired or when not in use. All controls must be checked to be in a neutral position, with the motors stopped and brakes set, unless work being performed requires otherwise.
9. When not in use, all plant and equipment used for ground works must always be left in a safe position (e.g. scraper bowl lowered, excavator bucket resting on ground, etc.) and the power units immobilised.
10. All permanent or temporary access ways, bridges and crossings must be adequate in size and load ratings to allow safe passage of fully laden plant. Adequate warnings and restraints must be supplied to avoid overloading such access ways.
11. Pedestrian exclusion zones must be established and maintained around operating plant where there is a risk of workers being struck. The specific exclusion zones for stationary but operating plant must be clearly identified for each type of plant and an appropriate exclusion zone, i.e. a physical barrier, put in place.
12. All operator mobile phones (or other personal electronic equipment such as music players) must be turned off when plant is in use.
13. Unauthorised personnel shall not be permitted to ride on powered industrial trucks.
14. No plant must be overloaded and no load disposed such that material is dropped and causes a hazard.
15. All haul roads must be kept clean and the wheels of plants must be washed or otherwise cleaned before travelling on public roads.



Plants to be fitted with guardrails to provide fall protection for personnel accessing the plant during maintenance



Competent earth-moving plant operators carry out daily safe-start checks prior to work commencement

On-site Vehicular and Plant Movement and Control

Methodology

1. The Operation Traffic Management Plans must adequately assess and control risks to all personnel while being transported around site in vehicles. Controls include reductions to speed limits, signage, speed control devices, competent drivers, safety devices, and ensuring vehicles are in good condition.
2. Proper demarcation or barriers must be installed to limit the distance of the vehicles or machineries from any uneven, sloped or unstable surfaces. Where necessary this must be a proper engineered solution by a competent person i.e. Professional Engineer.

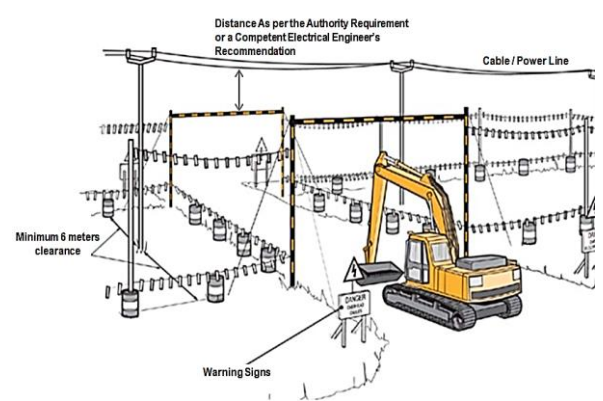
Delivery

1. Workers must not travel in the back of open back trucks on site unless fit for purpose seating is provided and no risks to workers' health and safety.
2. Vehicles are to apply park brakes when stationary. As far as possible vehicles are not to be parked on sloped surfaces. Adequate wheel chokes or stoppers are to be used where required, e.g. on slopes, uneven ground, etc.
3. All movement of vehicles, MEWPs and mobile plants where no adequate vehicle and pedestrian segregation must be managed by a trained traffic controller.
4. Proper wheel stoppers and traffic controller to be provided for vehicles working close to the slopes or excavations to prevent rollover.
5. Operators to avoid reversing activity and where it is not possible all reversing activities must be managed by a trained traffic controller.
6. All vehicle and machinery operations must follow the speed limit and traffic signage
7. All vehicles, plants & machineries are only to be used as per the manufacturer's requirements and design purpose.

ASIA APPLICATION STANDARDS



Trained traffic marshal/signallers guiding vehicular movement and loading/unloading activity.



Height Limit Barriers For Overhead Cables /Power Lines



Robust exclusion zone established around earth moving machine; a banksman provides traffic marshalling during excavation operation

SEPARATION OF PEOPLE & PLANT



Excavation operation that observes clear space between man and machinery

LIGHT VEHICLE (LV) ACCESS ROADS



Access roads planned for light vehicles (LV)

WHEELED PLANT STABILISATION



Example of stabilising vehicles with wheel chocks

PLANT SIZING COMPATIBILITY



Traffic and vehicular management plan includes plant sizing compatibility study, safe reversing procedures and means of effective communication

ASIA APPLICATION STANDARDS

Use of Technology



Fatigue Management

Monitoring / Reversing

Operator Competency

Methodology

1. All vehicle and machinery operators must be competent (having a valid license or certificate) to operate the vehicles or machineries which they are assigned to and be briefed on their use and particular hazards associated with the site as well as all the site rules and requirements. This includes machineries such as crane, boring unit, excavator, back hoe, etc.
2. Checks (verification of competency) must be made to ensure the competence of operators/drivers with respect to the specific vehicle, the site conditions and the work to be completed. Records of all documentation are to be kept along with copies of all licenses and certificates.
NOTE: Checks for competence are to be made at site induction and verification in the field prior to commencing works.
3. For countries that do not require, nor offer a formal qualification for machine operators, a minimum of 2 years experiences specific in operating the particular type of machine/equipment is required. Lendlease must conduct verification of competencies prior to the operator commencing on site
4. All operators/drivers are to be given clear instructions on site rules, PPE requirements and vehicle entry, movement and unloading procedures, and site hazards (incl. from overhead power lines), etc.

Delivery

1. All operators must follow any local road rules, manufacturer instructions and site rules. In addition, during any use of vehicles on-site seatbelts must be worn and operator mobile phones (or other personal electronic equipment such as music players) must be turned off.
2. Performance of the operators must be monitored on a regular basis to ensure Manufacturer's Instructions and site rules are being adhered to.
3. Drivers/operators must be fully informed and take the lead in ensuring that vehicles are stable during loading and unloading and that loads are properly secured.
4. All operators must have the right attitude, be responsive and conscientious.
5. Monitoring/supervision must be undertaken at regular basis during operation to ensure operating standards are maintained.



ASIA APPLICATION STANDARDS

Examples of specialty trade licenses - Crane operator (P.R.C.) and Excavator Operator (Singapore)

Physical Site Properties

Delivery

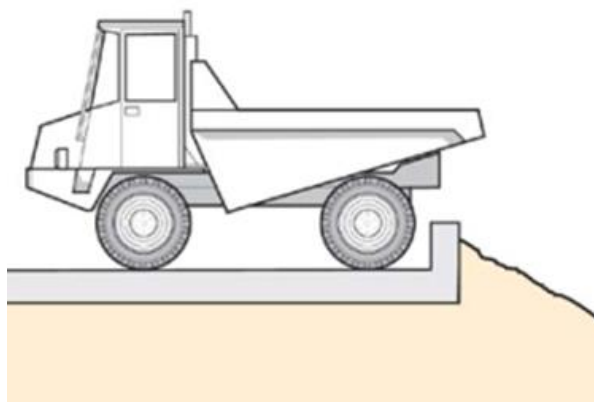
1. Edges around where equipment is being used must be protected with physical hard barriers / stoppers to prevent driving off the edge.
2. Leading edges and uneven work surfaces that can cause plant instability must be physical protected using barriers and/or engineered and approved road plates.
3. Vehicles and plants are only allowed to be driven on a well compacted road and in an angle as per the manufacturer's recommendation.
4. Ramps are to be constructed to the width and incline to suite all vehicles that will use them.
5. Operators to ensure their machineries are operated at a stable ground and in compliance to the manufacturer's requirements.



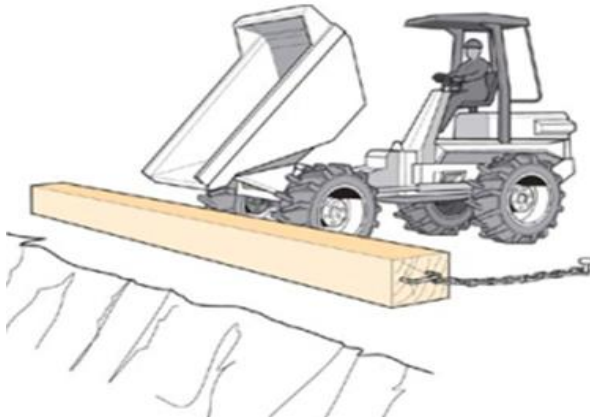
Rigid barriers with steel mesh are bolted onto the ground and set back to prevent equipment from being driven off the edge -



Engineered-approved steel plates provide stability during plant operation

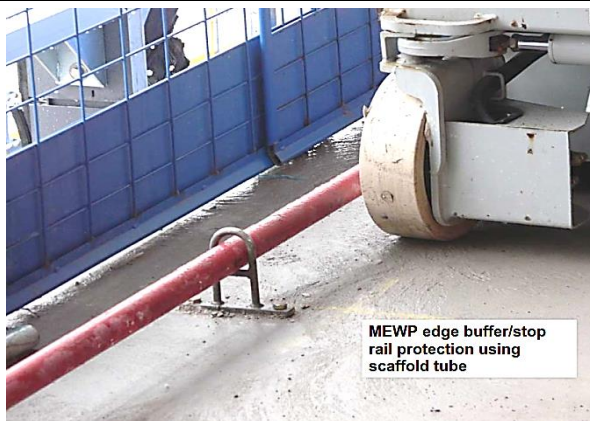


Wheel stoppers to be provided for vehicles working close to slopes or excavations



MEWP Safe Start cards on all machines.

MEWP edge buffer/stop rail protection using scaffold tube



MEWP edge buffer/stop rail protection using scaffold tube

Example of stoppers / rails to prevent MEWP being driven off to the edge

ASIA APPLICATION STANDARDS

Plant and Equipment Register				
Methodology				
1. An up-to-date register is to be kept of all plant, equipment and vehicles entering the site. 2. The register shall track all powered equipment entering and leaving the site including specific tracking points e.g. maintenance checks, statutory checks, etc.				
Delivery				
1. All vehicles and machineries must be inspected before entering the site. Records of the checklist are to be kept with the Plant and Equipment Register. As a minimum, the checklist must cover the following: a) Brakes or movement locking devices are effective b) Horn is working c) Lights are fully functional and clean d) Reflectors are in position and clean e) Windscreen is clean and washer/wipers working f) Seat belts for driver and passengers are functioning properly g) Visibility aids (e.g. mirrors, reverse camera or CCTV) are installed correctly and functional h) Visual and audible warning systems (revolving lights and alarms) are fitted are operating properly where required. i) A proper fall protections and access to the all serviceable points of the vehicles or plant and machineries must be provided. Where there is no provision in the manufacturer's original design, a modification to be done to ensure proper access and fall protections in place without compromising the integrity or safe operation of the plant and machinery. 2. Prior to leaving site, tyres and undercarriage are checked for cleanliness and free from debris.				
Statutory Checks and Certification				
Methodology				
1. A regime must be put in place to ensure that all statutory checks (where required) and documentation are correct, up to date and copies taken and filed. a) License b) Registration c) Insurance Cover d) Lifting Equipment Maintenance Log e) Lifting Equipment Test Certificates f) Sling/Chain Test Certificates g) Emission Checks 2. All powered mobile equipment and plant must be inspected by the receiving contractor before entering site to verify it is the correct model/specification as ordered, in well-maintained and safe operational condition, and possess the required permits/licences. 3. Lendlease are to inspect the equipment and verify the records and enter the equipment in the Plant and Equipment Register prior to commencing work on site. 4. A thorough check must be undertaken with particular focus on safety devices, belts, immobilising levers, lifting/load alarms, reversing alarms, mirrors, CCTV, etc.				
Delivery				
1. A means of identifying that the equipment has been inspected and approved for operation must be implemented on site. 2. Inspection regime: a) The operator is to undertake visual checks daily prior to use and logged in a daily inspection log. In addition, regular inspection and servicing schedules are to be adhered to in accordance with the manufacturers' instructions. The manufacturer's instructions are to be available at the machine. b) Formal checks are to be made weekly by the contractor to ensure maintenance is ongoing as per schedule/manufacturer's recommendations, no alterations made, no guards removed or defects developed. 3. Monthly inspections will be implemented by Lendlease to ensure the ongoing inspection and maintenance by contractors and the safe condition of the equipment.				
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Earth Moving Machinery

Delivery

1. All earth moving machines and quick hitch systems must be fitted and maintained in accordance with the manufacturers' instructions and checks made to ensure compatibility with each other.
2. Before allowing earth work machine operations to commence on site, ensure that:
 - a) All operators are trained – records to be maintained
 - b) Manufacturer's instructions and maintenance logs are available
 - c) Operators understand the safe use and maintenance requirements of their specific machines and quick hitches
3. Regular checks (at least weekly) are to be undertaken to ensure that:
 - a) All machines using quick hitch systems are used safely following the manufacturer's instructions (i.e. safety bars and pins are fitted to semi-automatic quick hitch systems)
 - b) Manufacturer's operating manuals for the machine and any attachments and an up to date maintenance log completed and signed off daily by the operator are available in the cab at all times
 - c) Effective exclusion zones to prevent workers being struck by machines or their tools are in operation
 - d) All maintenance procedures for earth moving machines are to be adhered to and recorded in a log book kept in the cabin.

Piling Machinery

Delivery

1. Stop blocks must be provided for the leads to prevent the hammer from being raised against the head block.
2. A blocking device, capable of safely supporting the weight of the hammer, must be provided for placement in the leads under the hammer at all times while operatives are working under the hammer.
3. Guards must be provided across the top of the head block to prevent the cable from jumping out of the sheaves.
4. Safety chains, or equivalent means, must be provided for each hose connection to prevent the line from thrashing around in case the coupling becomes disconnected.
5. Guys, outriggers or counterbalances must be provided as necessary to maintain stability of pile driver rigs.
6. Engineers and winch operators shall accept signals only from the designated signalmen.
7. All employees must be kept clear when piling is being hoisted into the leads.
8. When piles are being driven in an excavated pit, the walls of the pit shall be sloped to the angle of repose or sheet-piled and braced.
9. When it is necessary to cut off the tops of driven piles, pile driving operations must be suspended except where the cutting operations are located at least twice the length of the longest pile from the driver.
10. When driving jacked piles, all access pits shall be provided with ladders and bulkheaded curbs to prevent material from falling into the pit.

Mobile Elevated Work Platform (MEWP)

Delivery

1. Where possible, MEWPs shall be fitted with secondary anti-crush device to prevent the operator from being crushed between the MEWP and surrounding structures.
2. The anti-crush device can be either a physical structure or an electronic device.
3. Any anti-crush device not provided by the manufacturer is to be certified by a suitably qualified and experienced person.

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Physical anti crush device



Electronic anti crush device

Site Rules

Delivery

1. Daily pre-start worksheets will be maintained by all operators of all plant whilst on site. This is to be in accordance with any and all requirements set out in the operator's manual and manufacturer's/hirer's requirements.
2. Manufacturer's instructions must be available and adhered to e.g. seat belts must be worn at all times during operation.
3. Operators must ensure that no passengers are carried on vehicles which do not have proper seats provided.
4. Mobile phones, radios, personal stereos, etc. are not to be used and must be switched off whilst operating machinery.
5. No plant/vehicle which has an elevating process within its normal working parameters is to disengage from park or neutral until all parts have returned to the correct starting position. All operators are to make a visual inspection before they start to drive.
6. Segregate the plant operation area (establish Exclusion Zone) and restrict access to those not directly involved. Operations such as Bored Piling works must be provided with designated exclusion zones for each boring area with proper access for machineries and pedestrians. Congestion of plant (work in close proximity) need to be avoided by planning the construction sequence.
7. Exclusion zones to be provided with clear signage on the hazard and operations being undertaken.
8. Do not enter Exclusion Zones around plant operation area.
9. Ensure only competent personnel operating and banking the machinery.
10. Ensure operator and signalmen have clear understanding on the signals with proper means of communication.
11. Signal man and operator to ensure they don't lose sight each other while managing the operation except for lifting works at different levels or blind spots by signal man where two way radio will be required as means of communication.



ASIA APPLICATION STANDARDS



Ensure that operators and those banking machinery have the correct level of competence.



Ensure that clear signals are agreed between drivers and those banking the machinery.



Never lose sight of the person who is banking your machine!

Examples of site rules

GMR Subsection: 4.3.6 Installation, Inspection, Maintenance and Dismantling

Controls: Fixed and mobile plant must be installed, erected, adjusted, inspected, maintained and dismantled in safe locations, in accordance with the manufacturer's requirements and by qualified personnel.

Performance Standards:

- i) Proposed installation, inspection, maintenance and dismantling of major plant or equipment on a project must be risk assessed to determine if the works can be undertaken off the project. Where this is not possible, all works must prevent workers being struck by components from stored energy, rotation, overturning, toppling or other forces. Controls must include addressing the isolation and lockout of stored energy, stabilisation, and temporary or permanent structural support of the plant or equipment (or components). Where there is a risk of workers being struck, establish and maintain physical exclusion zones around plant that is being installed, modified or dismantled.
- ii) Where fixed and mobile plant is provided to Lendlease, suppliers must provide a complete set of the manufacturer's operating and maintenance instructions. Inspection and maintenance records must be kept with the plant and conform to the requirements of the standards applicable to the region of operation and as per the manufacturer's requirements.
- iii) All plant must be installed, inspected, maintained and dismantled by qualified personnel in accordance with the manufacturer's instructions.

General Requirements

Methodology

1. All plants and equipment shall be assessed to see if the related works (installation, inspection, maintenance and dismantling) can be moved off-site. Where this is not possible, risk assessment must be done to prevent workers from being struck by components during the work. Controls to address the risk must be put in place to address the isolation, lock-out of stored energy, stabilisation, temporary and permanent structural support for the plant/equipment.
2. All plant and equipment used on Lendlease operations or assets must be thoroughly inspected and certified "safe for use" before use, after any significant alteration or repair and at regular intervals in accordance with manufacturer's requirements. Inspection records to be kept on file.
3. Plants and/or equipment that are more than ten years old must be subject to inspections every six months (immediate inspections are required for such plants or equipment in current use, unless they have had such inspection within the last six months).

Delivery

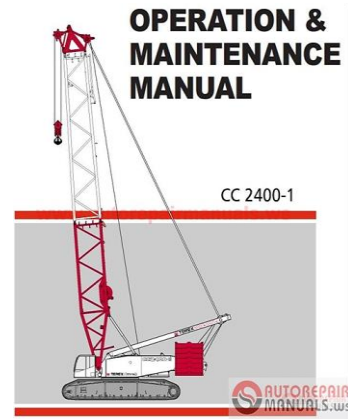
1. An effective system for scheduling inspection and maintenance work must be maintained. The system **is to** have the ability to provide information on:
 - a) When the inspection or maintenance is due for each item of plant on the register;
 - b) Any outstanding inspection and maintenance;
 - c) Who is responsible for undertaking the inspection and maintenance work; and
 - d) The required type of inspection or maintenance.
2. Confirmation that the plant is safe to operate must be verified before returning it to use after being cleaned, inspected, serviced or repaired.

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Installation/ Dismantling of plant and machineries at a safe location



Suppliers to submit Operation & Maintenance Manual

Maintenance

Methodology

1. All Lendlease operations are to establish and implement an effective maintenance programme to inspect and maintain plants, vehicles, equipment, etc. in safe and good working conditions. A maintenance log to record all maintenance works must be kept with the Plant and Equipment Register.
2. A plant and equipment maintenance regime shall be implemented as per the manufacturer's instructions ensuring that all plants and their associated components are in good, safe and sound condition. Maintenance program is to include all safety devices and mechanisms, accessories, etc. and be carried out by experienced and competent plant and equipment maintenance personnel.
3. An up to date maintenance register of the specific items of plant/equipment requiring a preventative maintenance programme must be maintained.
4. Plant hire companies must provide relevant information to enable all plant to be used and maintained safely.
5. All parties are to be made fully aware of their duties and held contractually liable for the responsibility of inspection and maintenance.

Delivery

1. Drivers must be instructed to report defects. All repairs are to be carried out in accordance with the manufacturers' instructions.
2. All emissions from plant are to conform to all local environmental regulations regarding emissions standards.
3. All mobile plants are to be strictly used in accordance with the manufacturer's specifications.
4. No modifications are to be made without the manufacturer's written permission or as directed.
5. Exclusion zones are to be erected around any plant or part of plant under maintenance or repair where risk of injury exists in the event of failure (e.g. free fall of crane block, etc.).

Inspection Regime

Methodology

1. All plant and equipment must be subject to an inspection regime to ensure that all parts, equipment, and accessories are in safe operating condition and free of apparent damage that could cause failure while in use.
 - Service brakes, including trailer brake connections
 - Parking system (hand brake)
 - Emergency stopping system (brakes)
 - Tyres
 - Horn
 - Steering mechanism
 - Coupling devices
 - Seat belts
 - Operating controls
 - Safety devices

Delivery

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1. Mandatory initial and ongoing recorded inspections verifying sound condition and good working order, including testing of mandatory safety devices are to be conducted by experienced and competent persons.
 - a) An initial inspection (prior to first lift on site) conducted by an experienced and competent person using a Lendlease approved checklist. The plant/equipment ID number and other required information is to be written on a current month inspection label to be visibly affixed. The plant/equipment shall then be entered in the Operation Plant & Equipment Register. A copy of the signed and completed checklist is to be kept in operation records.
 - b) Daily visual inspection and testing of safety devices by the operator using a Lendlease approved checklist. The operator is to keep a record of daily inspections.
 - c) Monthly inspection by an experienced and competent person using a Lendlease approved checklist. The new month inspection label is to be visibly affixed to the plant/equipment and a copy of the signed and completed checklist kept in operation records.
 - d) After any repair of the plant/equipment shall be subjected to inspection by the plant mechanic who carried out the repair (or another suitably qualified person). A copy of this re-inspection is to be kept in operation record.
2. All defects must be corrected before the vehicle is placed in service. These requirements also apply to equipment such as lights, reflectors, windshield wipers, defrosters, fire extinguishers, etc., where such equipment is necessary.

GMR Subsection: 4.3.7 Vehicle and Plant Recovery and Rescue

Controls: Effective measures must be in place for the recovery of vehicles and plant immobilised or bogged in mud, sand or other type of similar traction resistant ground conditions.

Performance Standards:

- i) Before an attempt is made to recover a bogged vehicle or plant either through freeing up or digging out the obstructions and/or via the aid of recovery boards and planks to facilitate grip and traction, an assessment of risk must be carried out.
- ii) Towing of bogged vehicles and plant can only be undertaken when engineering attachment points and/or other methods are identified and verified.
- iii) The suitability of recovery equipment such as cables, winches and hooks used to tow vehicles and plant must be fit for purpose and verified by an engineer.
- iv) Only approved rated recovery equipment can be used. Snatch straps and other equipment such as chains, webbing slings, load resistant slings and rope must not be used for the recovery of vehicles and plant.

General Requirements

Traffic Incident Emergency Procedures

Delivery

1. In the event of an incident involving the vehicle, the driver is to:
 - a) Stop and not move the vehicle (unless where required in order to make the area safe)
 - b) Provide first aid or call for assistance if necessary
 - c) Immediately notify the Lendlease person-in-charge of the incident
2. The Lendlease Team Leader shall initiate a report and investigation process compliant with the Lendlease Incident Management System. Contractor to submit their independent report to Lendlease
3. All operatives are to comply with the respective Operation Emergency Response Plan as outlined at the safety briefing.

Vehicle and Plant Recovery

Methodology

1. All Lendlease Operations must plan, establish and maintain vehicle and plant access routes so as to avoid the possibility of vehicles becoming bogged. The ongoing suitability of vehicle access routes must be reviewed on a regular basis, as well as after any rain or storm event or where alterations have been made to the site logistics plan.
2. Where vehicle/plant recovery and rescue is required due to 'bogging', a risk assessment must be undertaken to ensure the most appropriate method of rescue / recovery is in use.
3. Recovery of a bogged vehicle is a High Risk Activity and precautions must be taken to manage the inherent risks. The following hierarchy of rescue and recovery methods must be applied:
 - a) The Lendlease default position is to "drive out" the bogged vehicle. This is to be achieved by either; freeing up or digging out any obstructions around the vehicle, and/or via the aid of recovery boards / planks so as to facilitate adequate grip and traction to allow recovery without the need to use other vehicles or plant.

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- b) Where it is not possible to facilitate the “drive out” of a vehicle then alternate solutions such as the towing of bogged plant / vehicles can be assessed.
4. Towing of bogged plant / vehicles can only be undertaken where the engineered attachment points on any plant / vehicles involved, as well as the suitability of any equipment in use (e.g. cables, winch, hooks etc.), is verified by an Independent Engineer. In all circumstances the use of ‘snatch straps’ (Synthetic dynamic straps used in the recovery of light vehicles) or Chains (of any type - lifting webbing slings / load restraint slings, rope) is strictly prohibited as part of the recovery and rescue process.

HOLD POINT: If a vehicle / or piece of plant cannot be moved either via the default means of driving out or through safe towing means, approval to proceed must be sought from the Business Unit Head of EH&S to proceed with alternate means.

Delivery

GUIDANCE

1. Prior to rescue / recovery commencing, the ground conditions must be assessed to ensure no other vehicles become bogged.
2. Communication protocols must be established, ensuring they are clearly understood before commencing the recovery. Radio or visual contact is to be maintained at all times between the operators of the disabled vehicle, the recovery vehicle and the person supervising the recovery.
3. When recovering loaded vehicles, the mass of the load and the *safe working load* of the *recovery* equipment must be assessed and where doubt exists the equipment must be unloaded.
4. Where Vehicles and plant are fitted with towing points, the rescue equipment must not be connected to the towing point. As these are rated for towing and not for recovery on ‘bogged’ or stuck vehicles.
5. Only engineered attachment points are to be used for the recovery with appropriate supervision. If the attachment points have been damaged, or their effectiveness during the recovery is in question, specialist advice is to be obtained.
6. Extreme forces are generated during recovery and therefore correct attachment to each vehicle using appropriately rated attachments and recovery points are imperative for vehicle, driver and bystander safety.
7. All ground personnel are to be outside a radius of at least 1.5 times the length of the recovery equipment.
8. Only approved shackles of the correct rating are to be used.
9. On completion, all vehicles or plant involved in the recovery are to be inspected for damage and if they Lendlease vehicles this will be completed by Plant Personnel, 3rd party workshop or person responsible for vehicles on the project.
10. Any environmental damage caused is to be rectified as soon as is practicably possible.

Review

1. A comprehensive review is to be undertaken to ensure all factors pertaining to prevention and rescue of bogged vehicles are adequately addressed and managed.
2. As a minimum, all elements in the checklist below must be incorporated as part of the review.

Review Checklist

Project Name:		Check		Remarks
		Yes	No	
1.	All vehicle access routes have been reviewed and assessed to be suitable for their intended use and site demands (third party verification available where required; grading and compaction details of site access road to be clearly documented in Logistics Plan and communicated to all relevant parties).	☐	☐	
2.	Loading and unloading areas are provided where vehicles turning and reversing are minimised.	☐	☐	
3.	Adequate control measures have been put in place to prevent plant / vehicles going off designated access routes - e.g. physical barriers, clear markings / signage indicating no-go areas, traffic marshals, etc.	☐	☐	
4.	A process is in place to ensure vehicle access routes are reviewed on a regular basis, after any rain or storm event, during and after backfilling, or where alterations to the Project Logistics Plan have been made, to ensure suitability of the access routes for service	☐	☐	

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5.	A location specific Rescue and Recovery procedure has been developed, reviewed, communicated to all relevant stakeholders and implemented.	☐	☐	
6.	The Rescue and Recovery procedure:			
6.1	Clearly establishes the recovery equipment / accessories that will be used in carrying out the recovery	☐	☐	
6.2	Includes a verification by an Independent Engineer that recovery equipment / accessories used are suitable, fit for purpose and in good working condition (no visible tears or other damages)	☐	☐	
6.3	Where shackles are used, the Safe Working Load (SWL) is greater than that of the recovery equipment	☐	☐	
6.4	Provides consideration for any other possible hazards presented by your particular situation, e.g. proximity of hazards, traffic, live services, pedestrian routes, etc.)	☐	☐	
6.5	Includes an assessment and consideration of the gross weights of both plant / vehicles (including loads)	☐	☐	
6.6	Describes the set-up of necessary traffic controls, including details of exclusion zone with robust barriers and warning signs around the recovery location, and watchmen allocated to prevent unauthorised entry	☐	☐	
6.7	Ensures the recovery route is free of any obstacles or hazards (e.g. trees, boulders, other proximity hazards, etc.)	☐	☐	
7.	Describes details of clear communication protocols to be established between the two operators / drivers.	☐	☐	
8.	Where towing of bogged vehicles / plants are required, engineered details of attachment points are available.	☐	☐	

ASIA APPLICATION STANDARDS

GMR Subsection: 4.3.8 High Visibility Clothing

Controls: All people working on or adjacent to traffic routes and vehicles operating on Lendlease operations must have sufficient high visibility clothing and reflective visible markings.

Performance Standards:

- i) All people working adjacent to traffic routes or engaged in traffic management activities must wear high visibility clothing that meets applicable regulatory or industry standards.
- ii) All reflective markings on vehicles or plant on Lendlease operations must be in good condition and comply with regulatory or industry standards.
- iii) When working at night, provide suitable high visibility clothing (e.g. effective retroreflective stripes).

General Requirements

Delivery



High Visibility Clothing for traffic controllers and when working at night
High Visibility Clothing to have reflective strips on both the shoulders and waist level

Note:

- This Application Standards provide guidance that meets the GMR requirements.
- The requirements should be implemented across projects to ensure that projects comply with GMR and reduce risks associated with the works.
- If site conditions require changes to proposed standards, please consult your project EHS leads and/or Country EHS managers and/or Regional EHS team to confirm the intent of the GMRs are still met.

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