Guidance on Safety Specifications for the purchase or leasing of Plant and Machinery

Safety Begins with Me

For internal company use only

Guidance on Safety Specifications for the purchase or leasing of Plant and Machinery

This guidance is intended to assist Production and Safety personnel in compiling detailed Safety specifications and standards for inclusion in the overall purchase specification for new Plant and Machinery.

When purchasing individual plant sections entire production plants or vehicles, those compiling the purchase specification should simply refer to the relevant section, and quote the standards or Safety requirements referred to in that section.

This document will undergo a cross functional review during H2 2016, with a new version to be in place by January 2017

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Michael Keating
HSE Director
CRH Europe
May 2016

We request that all suppliers we engage, sign up to our Supplier Code of Conduct at:

(http://www.crh.com/our-group/our-people/corporate-governance/codes-of-conduct)

Suppliers must comply with all relevant laws relating to human rights, health, safety and the environment and anti-bribery and corruption (including the UK Bribery Act, US Foreign Corrupt Practices Act, OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and high-Risk Areas and section 1502 of the Dodd-Frank Act, if applicable).

Suppliers must also adhere to good ethical practices as set out in the CRH Code of Business Conduct (page 11) and specifically undertake:

1. To support and respect the protection of human rights within their areas of influence.
2. To respect freedom of association and the effective recognition of the right to collective bargaining by employees.
3. To prohibit all forms of forced, compulsory and child labour.
4. To support the principles of equal opportunity in respect of the recruitment and selection of employees.
5. To comply, as a minimum, with all applicable health & safety legislation and continually improve stewardship towards best industry practice.
6. To comply, as a minimum, with all applicable environmental legislation and support a proactive approach to environmental challenges.
7. To comply with all relevant anti-bribery and anti-corruption legislation in respect of their dealings with CRH.
8. To comply with the OECD guidance as well as Section 1502 of the Dodd-Frank Act which aims to prevent the use of minerals that directly or indirectly finance or benefit armed groups in the Democratic Republic of the Congo (DRC) or in adjoining countries (“conflict minerals”).

The respective procurement teams across the CRH are increasingly embedding the Supplier Code of conduct into their Technology, systems and processes.

To understand more and to request support please contact your local Procurement team or Richard Frost, European Responsible Sourcing Manager, richard.frost@tarmac.com

Contents

Fixed Plant & Machinery

Mobile Plant

1.1 Guards on snub rollers, head and tail drums must prevent access to in-running nip points - the guard must extend for a minimum distance of 1 metre from the nip point - dimensions and general construction should be in accordance with BS7300:1990 / EN 618 & 620.

1.2 All Guards should be painted Red (or other high visibility colour such as yellow), and be secured such that they require a tool to remove them i.e the use of quick release clips, such as toggle clips or tail gate catches is not permitted, neither are hang on guards.

1.3 All accessible snub and return rollers must be guarded by mesh bolted to the underside of the conveyor (Ref: EN ISO 13857). Plate type guards can also be fitted along the full length of the roller in front of the in - running nip point.

1.4 Skirting Guards or Load Point guards: In situations where fixed skirts are fitted above conveyor idlers, a trap point exists between the idler and the belt. Panels of guards should be fitted to prevent access to the trap points associated with the skirts of the conveyor.

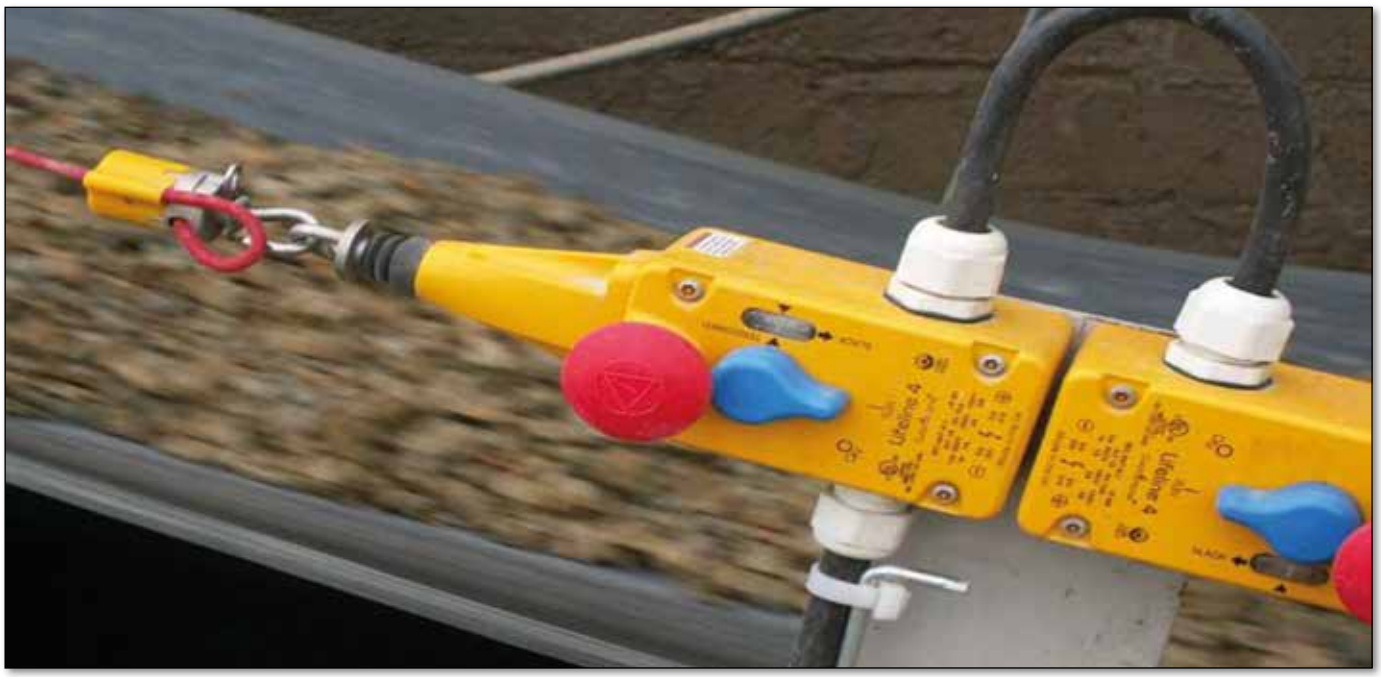
1.5 Gravity Take up Unit Guarding: Conveyor gravity take up units should be enclosed with mesh panels to a height of 2.5 metres which prevent access to moving parts within the tower including the risk of the gravity take up weight.

1.6 Screw Conveyors: where screw conveyors are provided with inspection covers, all covers should be secured with fastenings that require a tool for their removal. Exposed rotating shafts on the ends of screw conveyors should be fitted with adequate secure covers.

1.7 All accessible sections of conveyors must have an emergency Pull Cord covering the full length of the belt (for longer belts a number of cords may be used over the length of the belt) up to a height of 2.8 metres above the ground. An emergency stop for each belt must be positioned at the end (access point from the plant floor) of the catwalk.

All emergency pull cords must comply with EN620. A trip cord should activate a stop with a force less than 125N and a movement (of the cord) of less than 300mm.

The Emergency Stop must have a manual push button reset i.e resetting through Computer Software is not acceptable, all EM stops and pull cords should be part of the " Safety Circuit " and should on operation ensure that the power is switched out rather than be wired through the electronic control system on the machine.



1.8 There must be sufficient distance between the tail drum and floor to allow the safe insertion and removal of a spillage tray.

1.9 The V belt should be enclosed with a cover fitted over the exposed end of the shaft or bearings – a sheet metal guard is required to cover flexible coupling and input to the gear box.

1.10 Bolted on covers over the full length of the screw must be used at all times and access points must also have bolted on covers.

1.11 Any discharge points must either be long enough to prevent reaching the screw or have bars or similar, welded across them.

1.12 Belt feeders – the drive should be fully enclosed using either mesh or sheet metal as the guard material – a mesh guard should be fitted along the full length of the belt feeder.

1.13 A start warning system, giving 10 second audio and visual (flashing beacon) warning (of 3 second duration) for the start of the main conveyors should be installed.

1.14 Each motor must be have an accessible Isolator fitted , which where appropriate must be linked to compressor or hydraulic motors (Ref : EN1037 1996 – Prevention of unexpected start up of Machinery) .The Isolator should be within a reasonable distance e.g 5 metres of the applicable motor.

1.15 Remote Greasing/lubrication systems must be installed for rotors and all drums.

1.16 Belt adjusters must be placed outside machine guards.

1.17 Lifelong Bearings , to reduce maintenance and access related safety issues are required.

1.18 Around the head drum , there must be a full 4 sided working platform with guard and mid rails and toe boards.

1.19 Some conveyors may require catwalks on both sides.

1.20 The minimum width of a catwalk should be 850mm.

1.21 Conveyors passing over traffic routes must be fully enclosed.

2.1 Provision should be made for lubrication of bearings from outside the guards, where bearings are obscured by the guard, lubricators should be placed in a prominent position and connected to the bearing by a pipe line.

2.2 Drives – guards must fully enclose the transmission and drive wheels.

2.3 All drawback springs etc should be shrouded if there is any possibility of trapping a finger or an article of clothing.

2.4 All access/inspection doors must be electrically interlocked.

2.5 Jaw Crusher – in addition to the standard requirements for the guarding of all drives and nip points, the Jaw crusher adjustment to be hydraulically operated.

2.6 If the machine is fed direct from a chute, the side edges of the chute should be protected by stanchions and hand rails or chains. The crusher discharge should be protected by a discharge chute and arranged to take a dust discharge point if necessary.

2.7 On mobile crushing plants, all drives to the various parts of the plant should be guarded by fixed guards.

2.8 Gyratory Crushers: V Belt drive system should be guarded as per section 1.

2.9 Impact Crushers: Drive system to be guarded as per section1. The breaker bars should be held in place by steel straps. These steel straps or clamping straps should cover at least 3 breaker bars.

2.10 Screens - balance weights should be completely enclosed by a guard of sheet metal construction (when run down vibration creates a problem a sheet rubber insert may be required to protect the sheet metal guard).

2.11 The provision of lifting attachments should be considered where mechanical means of lifting may be required.

2.12 Access: No rungs, step treads must be flat, anti-slip with a minimum depth of 75mm.

2.13 Access: If more than 2 steps, access by an incline system preferably via a stairway but as a minimum with an angle of inclination from the horizontal no greater than 75˚.

2.14 Access: First step on access system to be rigid.

2.15 Platforms for routine maintenance (including tasks such as cleaning windows or mirrors preferably carried out from ground level) at a height of between 1 and 2 metres above the ground or a safe working platform, shall have an anchorage point (or handhold or handrails capable of being used as an anchorage point) provided on the inside, so that a fall restraint device may be attached.

2.16 Electrical cables, hydraulic cables and fuel lines to be run and attached so as to avoid chaffing and other damage that may lead to a fire. Where these are attached to a cable tray this shall be attached in a vertical orientation rather than horizontal to avoid a build up of abrasive dust and overheating.

3.1 The electrical equipment of machines , including the control systems and emergency stop circuits must conform to IEC 60204-1 (fault protection for power supply to the safety related parts of the control system).

3.2 Limit switches, used as part of safeguarding systems and emergency stop switches must be of the positive discrimination type, (those of the fast break type are acceptable if they include a positive disconnection element, in particular the failure of the return springs should cause the contacts to drop out.

3.3 All electrical sockets/switches and light fittings should be suitable for a wet and dusty environment, as a minimum level of protection the electrical apparatus should have an IP rating of IP65. All switches should be lockable.

3.4 Electrical Distribution Panels – all circuit breakers and busbars must be fully enclosed by a Perspex or other suitable cover. An internal lighting system should be in place in the panel which activates when the panel door is open. All cables should come in through the bottom of the panel.

3.5 The Panel design should be such that if a person is required to remove this perspex cover, he can fully isolate the panel from the Supply Transformer.

3.6 Signs (in English and Russian) stating the following:

Caution
Where these covers have to be removed – the panels must be fully isolated through the supply transformer.

3.7 For the safe use of Hand Tools around the machine - a 110V Transformer is required.

4. Hydraulic Safety Considerations

4.1 In Safety critical lifting operations, forklift trucks, excavators, scissors lifts etc – protection against the effects of failure of pressure in the supply pipe line(s) should be provided by **hydraulic locking valves attached to the operating cylinder(s)** which lock the pressure in the cylinder when the control pressure falls at a greater than predetermined rate.

4.2 **Single Ram** down stroking presses should have a hydraulic locking valve fitted to the lower inlet to the cylinder body to prevent inadvertent down stroking in the event of oil supply loss or failure. The control circuits should be arranged so that failure of the pilot pressure causes the machine to go to a safe condition.

4.3 **Hydraulic Safety** circuits should be an inherent part of the normal machine control circuits using standard 2 or 3 spool valves with appropriate porting. Actuation of the valves can be manual, solenoid, pilot oil or air operated.

4.4 **Hydraulic Pipe** installations should be of rigid steel with adequate supports. Where **flexible pipes** are used they should be capable of withstanding the maximum operating pressure, not be linked or stretched and be restrained by rigid supports at each end. Couplings and joins in the pipes should be suitable for the system pressure and should be capable of withstanding any vibrations, both mechanical and hydraulic, likely to be met in service. **Pipework** should be labeled to indicate it's function in the circuit.

5. Pneumatic Safety Considerations

5.1 Pneumatic Safety circuits should be compatible with the normal machine controls and, as far as possible, use standard two or three spool valves with appropriate porting. Actuation of safety control valves can be by guards, solenoids or pilot air.

5.2 All components in a pneumatic system should be rated for the working pressure of the system - each **should carry a label stating:**

- Manufacturer's name and address
- Manufacturer's product identification
- Rated operating pressure
- For hose assemblies, the date of manufacture

5.3 Exhaust outlets from motors, cylinders, etc. should be fitted with suitable silencers.

5.4 Pneumatic valves construction can be either twin spool giving 2 way directional control of air flow, or triple spool with a central neutral position. For safety circuits, they should be of robust construction and of a size to suit the application.

6.1 Compressors

Compressors should comply with **EN1012-1** and be provided with:

- Adequate guards over belt and shaft drives.
- Suitable safety (pressure relief) valves at intercoolers, coolers and reservoirs
- Pressure gauges at compressor outlet, on each cooler, intercooler, reservoir and on pressurized lubrication systems.
- Temperature gauge at compressor outlet.
- On water cooled compressors, a water temperature trip at water outlet.
- Lubricating oil level indicator.
- Air inlet filter with indication of pressure drop across it.
- A well ventilated site having a clean cool air supply free from flammable or corrosive contamination.
- A clearly marked isolation switch.

6.2 Air Receivers

Air Receivers should:

- Be clearly marked with their safe operating pressures.
- Be of a size to match the compressor output and accommodate fluctuations in air demand.
- Carry a label giving:
  - the manufacturers name.
  - a serial number.
  - date of manufacture.
  - the standard to which the vessel was designed and built.
  - the maximum design pressure (or vacuum).
  - the design temperature.
- Be provided with:
  - an inlet and outlet port.
  - a pressure gauge.
  - a pressure relief valve.
  - clearly marked isolation device.
  - a drain.
- Have a manhole to permit internal inspections.
- Have a written schedule for inspections and examinations if the product of pressure and volume is greater than 250 bar litres.

6.3 Vacuum Pumps

Vacuum Pumps should comply with EN 1012-2. The belts and shafts driving the pumps should be guarded and a vacuum gauge fitted at the inlet to the pumps. They should be provided with an oil level indicator and a clearly marked isolation device. For larger installations and those serving a number of machines, the pumps should be located in their own separate sound proofed room.

7. Dryer

7.1 The guarding of the drive system for the cylinder should have Interlocked guards in place to prevent access under the dryer area - The maximum distance between the ground and guard should not exceed 225mm and the minimum height of such guards above ground level should be 2 metres.

7.2 Each motor must be have an accessible Isolator fitted, which where appropriate must be linked to compressor or hydraulic motors (Ref : EN1037 1996 - Prevention of unexpected start up of Machinery).

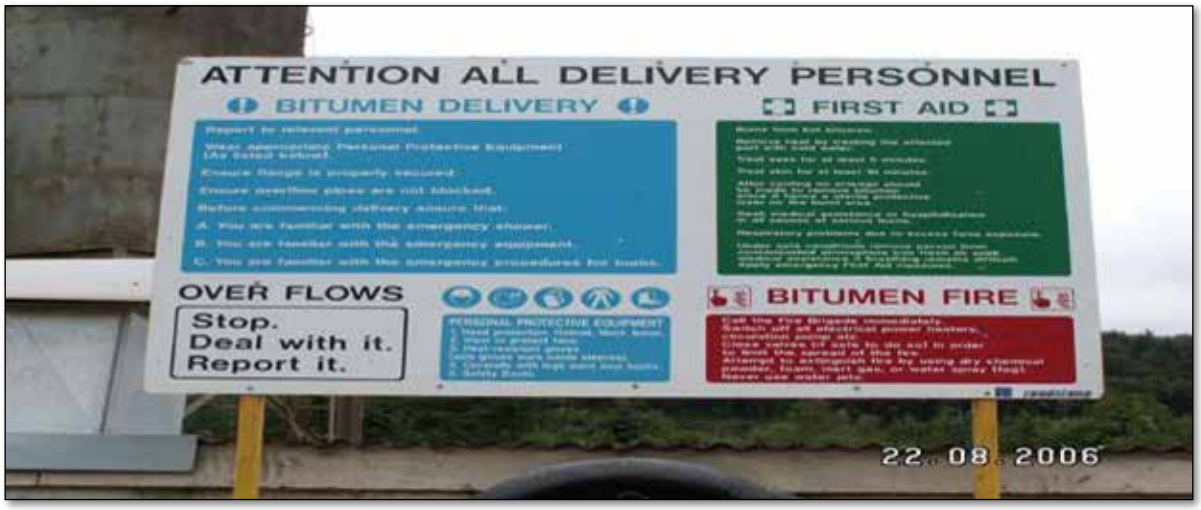
7.3 Local individual isolators must be provided for the burner, diesel fuel pumps, gas pumps, compressors and all exhaust fans.

8. Binder / Bitumen / Fuel Storage

8.1 Binder storage tanks should be located in the open.

8.2 Overflows and/or a high level warning device should be fitted to all tanks. The overflows should operate into an area which does not present a danger to personnel.

8.3 Manholes should be fitted with a grid beneath the main lid, to be raised only when access to the tank is required Exterior access to the manhole should be by fixed ladder to a non slip walkway provided with guardrails and toeboards.This also applies to interconnecting walkways on multiple tank installations.



8.4 To prevent ignition of possible leakages, external extensions of stirrer shaft drives and external discharge points should wherever possible be located at the opposite end to the firing system.

8.5 A low level cut off switch should be fitted to ensure that when binder level falls within the tank to the prescribed 150mm above the heater tubes, all power to the heating of the tank is cut off, then automatically restored when the contents rise again.

8.6 Electric wiring should be kept clear of vapours to prevent the fumes from rotting the insulation.

8. Binder / Bitumen/ Fuel Storage

8.7 External flues should be insulated and protected so as to preclude persons from receiving contact burns.

8.8 Fusible links should be attached to dead weight shut - off valves on fuel lines to each individual burners so that the fuel oil is automatically shut off in case of fire at the burner. When tanks containing bituminous materials are heated by gas burners or other fuel producing open flames, the flame should be of the jet or pressure burner type and be enclosed by a hood or baffles.

8.9 Binder circulation systems should be designed to afford maximum security against blockage. All pipework should by design be self draining and a minimum fall of 1:12 is recommended.

Fuel Storage

8.10 Manholes should be fitted with a grid beneath the main lid , to be raised only when access to the tank is required Exterior access to the manhole should be by fixed ladder to a non slip walkway provided with guardrails and toeboards.This also applies to interconnecting walkways on multiple tank installations.

8.11 All tanks should be bunded.

9. Hoppers

9.1 Where material is tipped directly into hoppers a metal grid (Man Grid) strong enough to withstand the impact and flow of materials should be constructed. The spacing of the bars should be such that a person will not fall into the hopper e.g within the 100 to 200mm centres range. Should it be necessary to enter a hopper a removable section must be provided.

9.2 Provision by way of a walkway with handrails is required to allow access in the event of a blockage or maintenance.

10. Bag Filter Units

10.1 Access - ladders rising more than 3.5 metres should be fitted with hoops commencing at 2.5m from ground level. The hoops should be spaced at 1.2m intervals and the internal clearance of the hoops should be in the region of 0.8m. For high rise ladder access, there must be a rest platform every 6 metres on the access ladder.

10.2 A fire detection system must be installed on the units - this should include a visual warning system to all Control rooms.

10.3 Each motor must be have an accessible Isolator fitted, which where appropriate must be linked to compressor or hydraulic motors (Ref : EN1037 1996 - Prevention of unexpected start up of Machinery).

10.4 Safe access to the stack for environmental monitoring must be provided.

10.5 Safe access for the changing of filter bags must also be provided - see 10.1 above.

11. Bucket Elevators

11.1 The area where the bucket returns for loading (& unloading), if accessible, must be guarded with an interlocked (to the elevator motor) gate.

11.2 The operating area of the elevator must be guarded off where a person could come into contact with the moving bucket.

11.3 Each motor must be have an accessible Isolator fitted , which where appropriate must be linked to compressor or hydraulic motors (Ref: EN1037 1996 - Prevention of unexpected start up of Machinery).

11.4 Skip loading area: where the skip returns to the loading position, a mesh panel guard fence should surround the mechanism and be securely fixed to the structure. An access gate will be required which should be secured by means of a suitable electrically interlocked system.

11.5 Hot Storage Skip Winch (at ground level): a mesh panel guard fence should surround the mechanism and be securely fixed to the structure. An access gate will be required which should be secured by means of a suitable electrically interlocked system.

11.6 Elevators should be fitted with a dual rope system.

12. Silos

12.1 Access – ladders rising more than 3.5 metres should be fitted with hoops commencing at 2.5m from ground level. The hoops should be spaced at 1.2m intervals and the internal clearance of the hoops should be in the region of 0.8m. For high rise ladder access, there must be a rest platform every 6 metres on the access ladder. It should be possible to lock the access point to each access ladder.

12.2 A notice indicating:
- The nominal capacity of each compartment.
- The safe working pressure should be clearly visible on each silo.

12.3 The Venting Filter should be chained to the silo.

12.4 Pressure Relief Valve.

12.5 Level Probe.

12.6 A Pinch valve or Butterfly value (both of these have the same function in that they cut off the flow to the silo once the high level alarm / signal is sounded - the bypassing of pinch valves can occur, so they need to be enclosed if they are accessible).

12.7 High Level Warning Alarm.

12.8 Guardrails on top to a height of 120 cm / mid rails to a height of 50 cm and toeboards to a height of 15cm.

12.9 Where the exhaust vent incorporates filter media capable of becoming blocked, a means of relieving this pressure should be fitted, set to operate at the safe working pressure.

13. Mixer

13.1 **Electrical Interlocking**
We require a Captive (or trapped) key system for the electrical isolation of the motor. The system should be such that the Key from the main control panel is not released until the mixer motion has completely stopped.

All interlock and Limit (Position) Switches must conform to EN60947-5-1, EN1088, EN292 and EN60204-1.

Trapped Key Interlock Switches must conform to EN1088, EN292, GSET 19.

Inspection hatches on the mixer cover should be provided with secondary grids to prevent contact with the moving paddles when the mixer is in operation. The discharge points should also be guarded to prevent against contact with moving parts of the mixer.

13.2 **Pneumatic Isolation**
Where the discharge door is operated pneumatically a valve should be fitted in the air supply and interlocked to ensure that the air is isolated and the actuating cylinder exhausted/vented to atmosphere before access can be gained into the mixer.

13. Mixer

13.3 **Hydraulic Isolation**
Where hydraulically operated, the isolator to the motor of the hydraulic pump must also be included in the interlocking system. A single electric isolating switch may be provided for both mixer and pump drive motors.

13.4 **Mixer Cleaning**
An automatic cleaning system which removes the need for personnel to enter the mixer is required.

14. Service Hoist

14.1 The SWL should be clearly marked on the hoist.

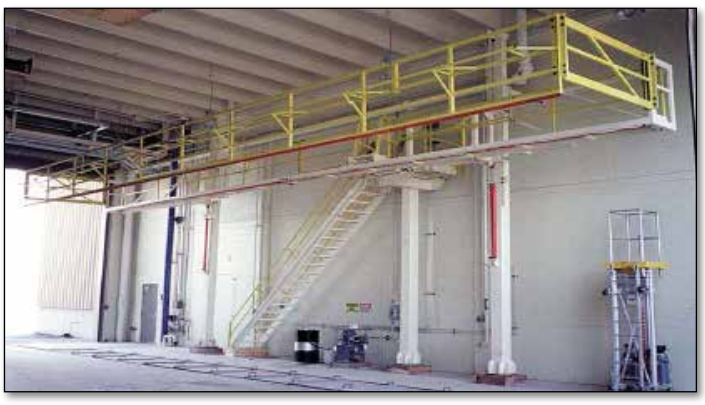
14.2 The operating area of the hoist must be guarded off where a person could come into contact with the moving Hoist.

14.3 Interlocked gates should be in place at both ends (and any intermediate floors) of the hoist operation, to prevent persons entering the area where the hoist operates. These interlocks must be linked with the hoist motor and cause the hoist to stop where an access is gate is opened when the hoist is still in transit.

15. Truck Loading Mechanisms

15.1 Safe access must be provided for access to the top of the loaded tanks - a pneumatic drop down walkway(s) would be suitable.

15.2 A start up warning siren, giving 15 seconds notice of operation, should be in place at the loading point.



16. Training – Health & Safety

16.1 Full Health & Safety Training must be provided by the supplier to operators and maintenance staff during commissioning of the Plant.

16.2 3 months after commissioning, follow up training shall be provided by the supplier to operators and maintenance staff - this is to allow for risks which become apparent, such as access, after plant commissioning.

16.3 Operation and Maintenance Manuals must be prepared by the supplier in accordance with ISO 12100-1;5.5.

Example of Training Required for a Mobile Crusher

1. The transport of the unit around the site i.e the use of the travelling gear.
2. The risks involved in changing from automatic mode to “repair” mode as this overrides the Isolation system.
3. The correct earthing procedure for the machine and the hazards of static electricity.
4. The assembly of the lateral discharge conveyor belt - correct procedure and risks involved - this should also include the folding up of the operator platform and feeding hopper.
5. Gap width(s) adjustment of the crusher e.g of the lower impact toggle.
6. The workings of the “main switch“ - to highlight in particular the cutting off of power from the generator and the “special excluded circuits “- this should also include any over current protective devices.
7. Precautions to be taken when working on hydraulic systems in terms of the supporting of conveyor belts and hoppers.
8. Procedure for securing the rotor for specified work.
9. Electricity - Supply and Risk Involved - to include earthing procedure for electric arc welding.

17. Noise, Dust & Vibration

17.1 All operator cabins must be constructed so that the Noise Level is less than 80 dB(A). Exhaust outlets from motors, cylinders, etc. should be fitted with suitable silencers.

17.2 Our operations operate under an occupational exposure limit for respirable crystalline silica of 0.05 mg/m3. All operator cabins must be constructed so as to prevent dust ingress, this should include the provision of air conditioning within the cab, and substantial sealing around windows and doors.

17.3 Whole Body Vibration should be reduced through the use of vibration proof foundations or pads. The daily **exposure** limit value (standardised to an 8 hour reference) shall not exceed 1.15 m/s2, and the daily exposure **action** value (standardised to an 8 hour reference) shall not exceed 0.5 m/s2.

18. Maintenance

18.1 Operation and Maintenance Manuals must be prepared in accordance with ISO 12100-1;5.5.

18.2 Safe Access must be provided for all Maintenance Operations – this includes safe access for checking of Daily Checks on Oil Levels.

18.3 There must be safe access to all Temperature Probes.

18.4 The Operations & Maintenance Manuals must be supplied in English and Russian.

18.5 All Maintenance procedures required must be documented in the Maintenance Manual, with circuit diagrams etc. where appropriate.

19. Installation of the Plant

INSURANCE: In respect of **new works**, details of the proposed contract must be advised to CRH plc, 42 Fitzwilliam Square before work commences. Copies of the contract conditions, together with details of any Public / Employer and Professional Indemnity policies covering the professional team, should also be forwarded to Fitzwilliam Square for vetting. Please note that it may be necessary to arrange special Contractors All Risks insurance in respect of certain projects.

The Erection of the Plant, will come under the relevant country's Construction Safety Regulations. The following CRH requirements will also apply.

19.1 In addition to the normal contractor prequalification process in each company, a method statement and risk assessment document, detailing the precautions required during the installation phase, must be prepared by the Main Contractor - this will be required in advance of the Project Commencing, as we are required to notify the Safety authorities of the commencement of the Project.

19.2 All personnel involved in the work must be competent.

19.3 Safety Documentation relating to the use of Cranes must be submitted in advance to Safety Department, this will include:

- The inspection certificate for the Crane e.g 12 or 14 months certificate
- The thorough examination certificate for the Crane e.g every 4 years
- The inspection certificates for all slings etc
- Evidence of driving / certification for the driver
- Please note that all crane operations on site will require the presence of a trained banksman.

19.4 Where the project involves work at height, a Mobile Elevating Work Platform (Cherry Picker) should be available (based on Project Risk Assessments).

19.5 Any scaffolding to be used on site must involve the following:

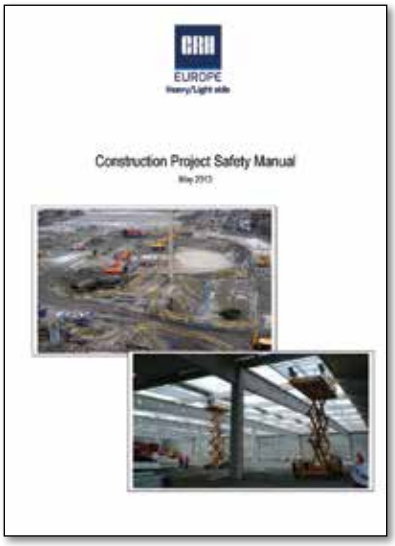
- It must be erected by a competent person (who holds a FAS CSCS or equivalent card).
- Arrangements must be put in place to ensure the daily inspection of scaffolding.

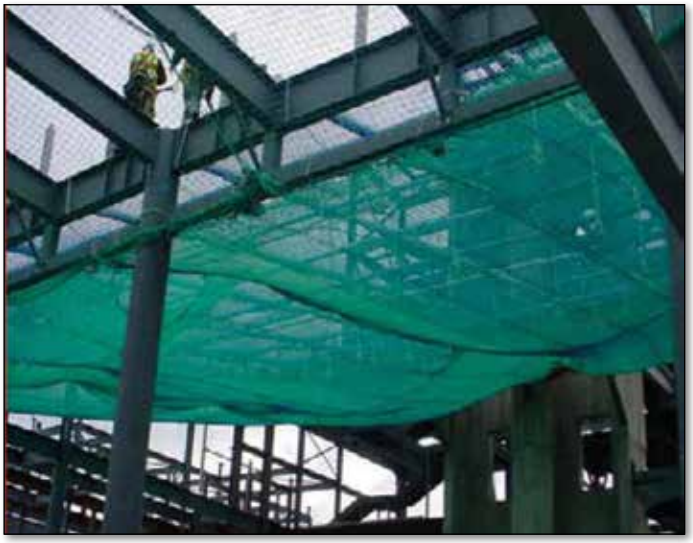
19.6 All work at height, outside the method statement must be notified in advance to the relevant Company Safety person. Safety Nets or Air Bags (for Fall Prevention) must be used where appropriate.

19.7 All trench/excavation work must be notified to the Safety Officer before any work commences.

19.8 No Lone working is permitted irrespective of the activity.

19.9 The CRH Construction Project Safety Protocol must be referred to.





1.1 CE mark certificate and plate. (Europe).

1.2 A Colour CCTV System , with casing offering a IP level of 68.

1.3 A Concave mirror with an attached or integrated convex mirror. A pedestrian mirror (over the windscreen looking down in front of the vehicle) should also be included. – see photo on page 20.

1.4 A reverse warning alarm and reverse warning light.

1.5 High Visibility Markings to the front and along the sides of the vehicle should be in place – see page 20.

1.6 Air conditioning. Our operations operate under an occupational exposure limit for respirable crystalline silica of 0.05 mg/m3 . All operator cabins must be constructed so as to prevent dust ingress, this should include the provision of air conditioning (using a HEPA (high-efficiency particulate air) filter)within the cab, and substantial sealing around windows and doors.

1.7 The Operations & Maintenance Manuals must be supplied in English and the relevant national language.

1.8 On board service brake testing facility. An exception is permitted if the relevant opco have a long term service contract in place with a national provider to conduct independent brake testing (at least 2 times per year).

1.9 A park brake alarm system. (when the driver leaves his seat without activating the parking brake, an audible warning alarm should sound).

1.10 (Tyre) Rock Ejector.

1.11 Roll Over Protection System (ROPS) and Falling Object Protection System (FOPS).

1.12 Seat belts with a dashboard audible warning and an external flashing beacon both of which indicate when the seat belt is not being worn.

1.13 Long life bulbs in the lighting system.

1.14 Suitable dry powder fire extinguishers must be fitted in a secure and accessible manner on board.

1.15 Ground Level fuelling point.

1.16 Ground level lockable isolation switch.

1.17 If more than two steps, access by an incline system.
(i.e. with an angle of inclination from the horizontal no greater than 75 degrees):

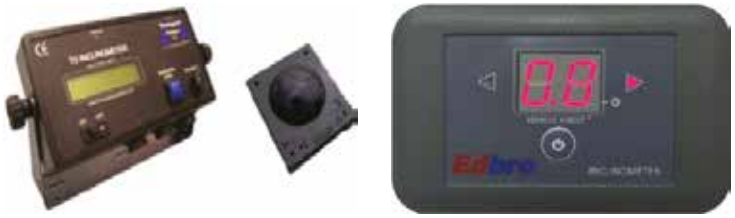
- First step to be rigid
- First step to be no more than 400mm off the ground

1.18 Warning indicators:

- Fuel Level and pressure
- Engine oil pressure
- Hydraulic oil level
- Engine air filter restriction
- Hydraulic filter bypass
- Service brake oil pressure
- Transmission filter bypass
- Engine inlet manifold temperature
- Hydraulic oil temperature

1.19 Articulated dump trucks must be fitted with an inclinometer.

1.20 Tinted windows.



1.21 All operator cabins must be constructed so that the Noise Level within the cab is less than 80 dB(A).

1.22 Safe Access must be provided for all Maintenance Operations - this includes safe access for checking of Daily Checks on Oil and fluid Levels e.g Sight auges for fluid level checks.

1.23 An automatic Fire Suppression System (for vehicle with a payload in excess of 40 T).

1.24 Body Tipper Alarm (Dump Trucks). Shift limiter - as the body is being lowered you cannot go up the gears.

1.25 Front radiator handrail.

1.26 A restraining system for the body of the dump truck, to cater for maintenance work with the body raised. This can take the form of a steel loader ram sleeve to prevent uncontrolled lowering or check valves on loader frame cylinders (to prevent uncontrolled lowering of frame and bucket in the event of a burst hydraulic hose).

1.27 Whole Body Vibration should be reduced through the use of vibration proof foundations or pads. The daily exposure **limit** value (standardised to an 8 hour reference) shall not exceed 1.15 m/s^2 ,and the daily exposure **action** value (standardised to an 8 hour reference) shall not exceed 0.5 m/s^2.

1.28 Access: First access step to be rigid and no more than 400mm off the ground.

1.29 Access: Guard rails should ideally be 1200mm (minimum 1100mm).

1.30 Access: if a step has to be used for standing on for maintenance it must be at least 320mm wide so as to accommodate both feet beside each other.

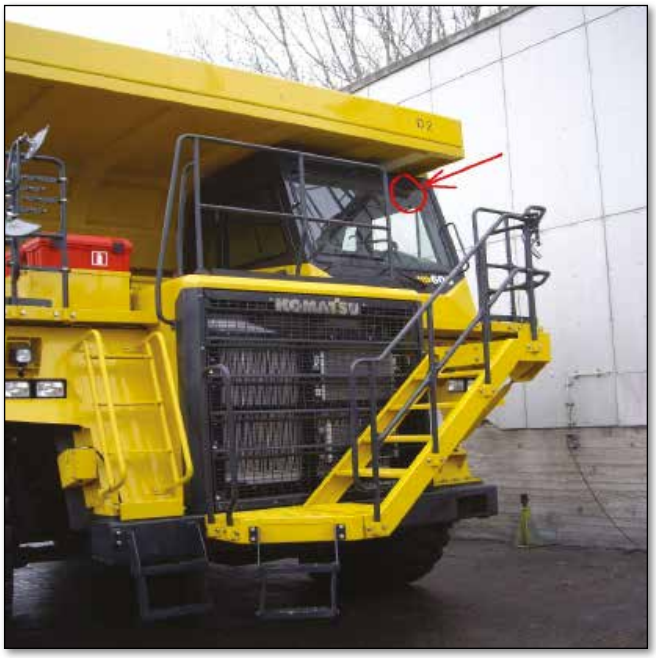
1.31 Access: all machines to be fitted with an autolube system for all greasing points (except rotating prop shafts).

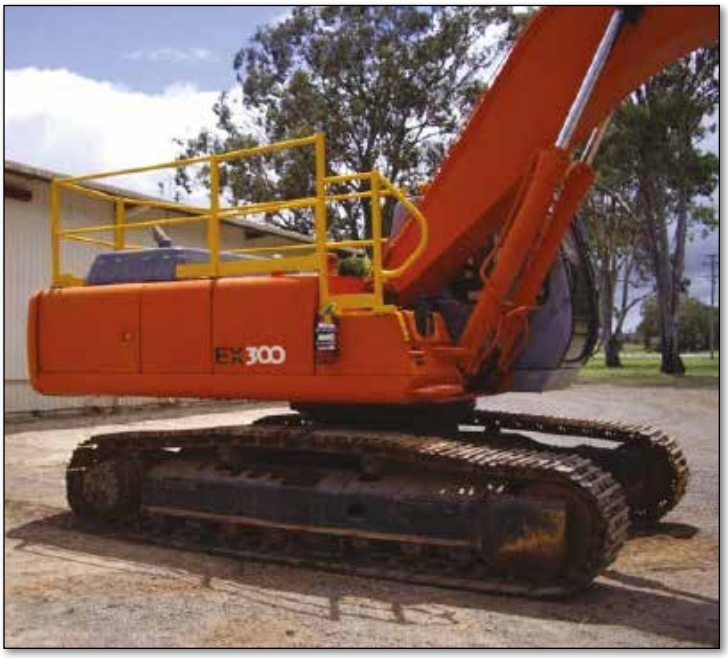
1.32 Radiators: A radiator cap with an effective depressurization interlock cap i.e to ensure the radiator pressure has been released before allowing removal of radiator cap; thus preventing scalds.

1.33 Communications in cab: dedicated location within cab for fixing communication equipment (to avoid retrofitting of equipment obscuring the driver's vision).

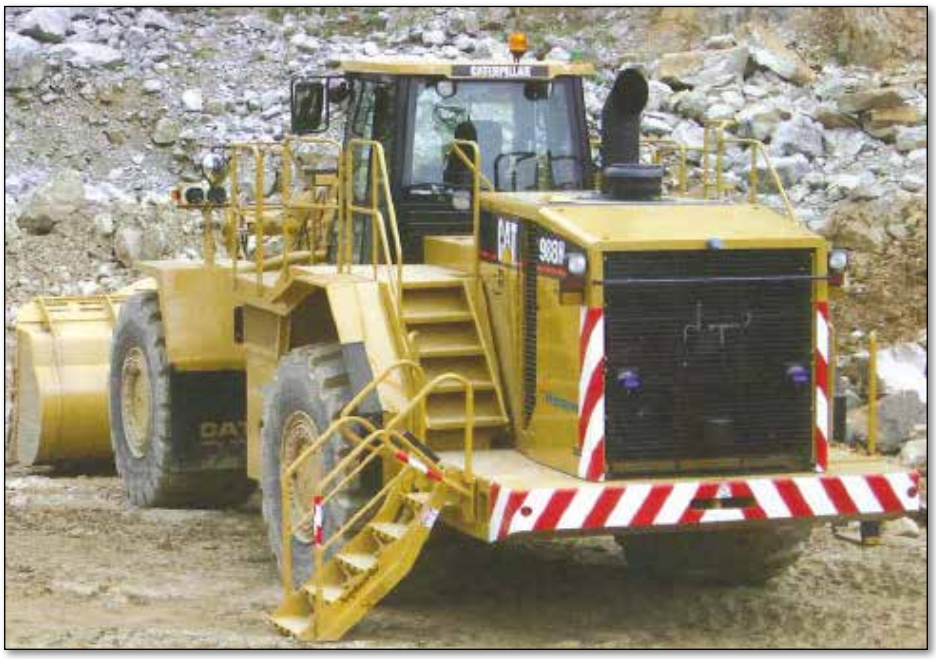
1.34 When the driver's door is opened, an external light fitted adjacent to the cab door must activate, this is to cater for situations where the driver may be working in reduced light conditions.

1.35 Remote battery connection systems e.g Euro Battery Connectors (EBC) such as the Anderson switches to be fitted to allow jumpstarting and battery charging without having to access the battery area.

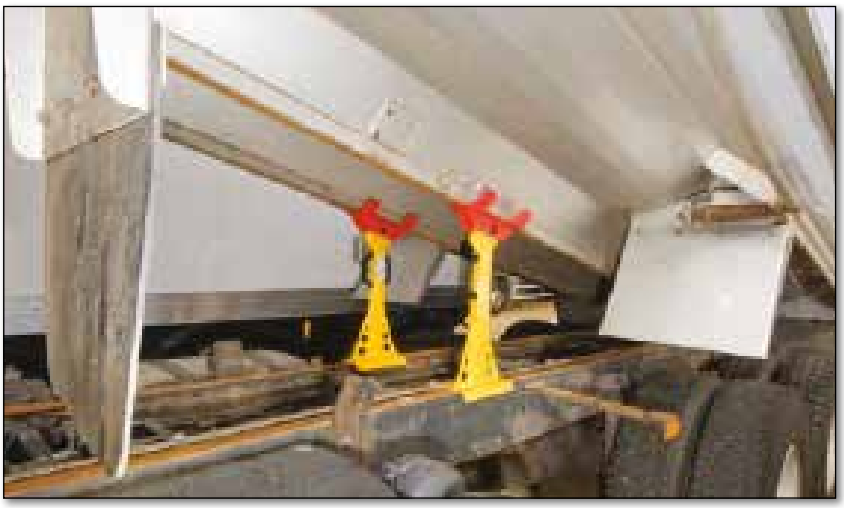




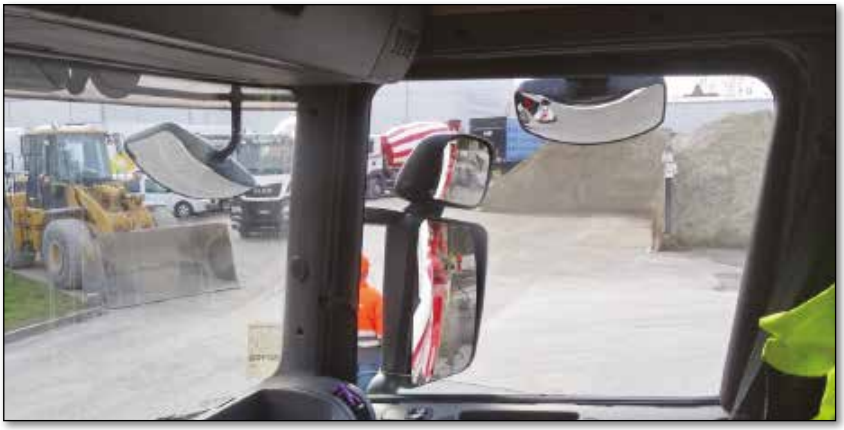
Safe Access: Note the handrails and access stairs and steps.



High Visibility Marking.



Vehicle Prop System.



Integrated Mirror System.

2.1 CE mark certificate and plate. (Europe).

2.2 A Colour CCTV System, with casing offering a IP level of 68.

2.3 The Operations & Maintenance Manuals must be supplied in English and in the relevant local language.

2.4 A Concave mirror with an attached or integrated convex mirror. A pedestrian mirror (over the windscreen looking down in front of the vehicle) should also be fitted.

2.5 A reverse warning alarm and reverse warning light. Red and White Chevrons to be painted on the counter weights or other suitable surfaces on the rear of each machine – see page 21.

2.6 Air conditioning. Our operations operate under an occupational exposure limit for respirable crystalline silica of 0.05 mg/m3 . All operator cabins must be constructed so as to prevent dust ingress, this should include the provision of air conditioning (using a HEPA (high-efficiency particulate air) filter)within the cab, and substantial sealing around windows and doors.

2.7 On board service brake testing facility.

2.8 High Visibility Stripping along the sides of the vehicle.

2.9 Roll Over Protection System (ROPS).

2.10 Parking alarm (when the driver leaves his seat without activating the parking brake , an audible warning alarm should sound).

2.11 Falling Object Protection System (FOPS) –

2.12 Seat belts with a dashboard audible warning and an external flashing beacon both of which indicate when the belt is not in use.

2.13 Tinted windows.

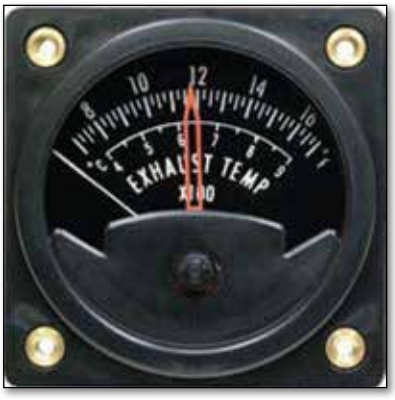
2.14 Long Life bulbs in the lighting system.

2.15 Ground Level fuelling point.

2.16 Ground level lockable isolation switch.

2.17 If more than two steps, access by an incline system
(i.e. with an angle of inclination from the horizontal no greater than 75 degrees):

- First step to be rigid
- First step to be no more than 400mm off the ground



2.18 Bucket function lock out.

2.19 Warning indicators:

- Fuel Level and pressure
- Engine oil pressure
- Hydraulic oil level
- Engine air filter restriction
- Hydraulic filter bypass
- Service brake oil pressure
- Transmission filter bypass
- Engine inlet manifold temperature cr Hydraulic oil temperature

2.20 All operator cabins must be constructed so that the Noise Level within the cab is less than 80 dB(A).

2.21 Safe Access must be provided for all Maintenance Operations - this includes safe access for checking of Daily Checks on Oil and Fluid Levels e.g Sight gauges for fluid level checks.

2.22 Whole Body Vibration should be reduced through the use of vibration proof foundations or pads. The daily exposure **limit** value (standardised to an 8 hour reference) shall not exceed 1.15 m/s^2, and the daily exposure **action** value (standardised to an 8 hour reference) shall not exceed 0.5 m/s^2.

2.23 An automatic Fire Suppression System (for vehicle overs 50 T).

2.24 Access: First access step to be rigid and no more than 400mm off the ground.

2.25 Access: Cab door shall be opened from a step of sufficient width for the placement of both feet no more than 500mm off the ground.

2.26 Access: Guard rails should ideally be 1200mm (minimum 1100mm).

2.27 Access: If a step has to be used for standing on for maintenance it must be at least 320mm wide so as to accommodate both feet beside each other and no more than 400mm from the ground.

2.28 Access: All machines to be fitted with an autolube system for all greasing points (except rotating prop shafts).

2.29 Radiators: A radiator cap with an effective depressurization interlock cap i.e to ensure the radiator pressure has been released before allowing removal of radiator cap; thus preventing scalds.

2.30 Communications in cab: dedicated location within cab for fixing communication equipment (to avoid retrofitting of equipment obscuring the driver's vision).

2.31 Suitable dry powder fire extinguishers must be fitted in a secure and accessible manner on board.

2.32 When the driver's door is opened , an external light fitted adjacent to the cab door must activate , this is to cater for situations where the driver may be working in reduced light conditions.

2.33 Remote battery connection systems e.g Euro Battery Connectors (EBC) such as the Anderson switches to be fitted to allow jumpstarting and battery charging without having to access the battery area.

3.1 CE mark certificate and plate. (Europe).

3.2 A Concave mirror with an attached or integrated convex mirror.

3.3 A CCTV system (to an IP protection rating of IP68) should be installed to allow all round vision for the driver.

3.4 Air conditioning. Our operations operate under an occupational exposure limit for respirable crystalline silica of 0.05 mg/m^3. All operator cabins must be constructed so as to prevent dust ingress, this should include the provision of air conditioning (using a HEPA (high-efficiency particulate air) filter) within the cab, and substantial sealing around windows and doors.

3.5 The Operations & Maintenance Manuals must be supplied in English and the relevant local language.

3.6 Hydraulic Hose Check valves.

3.7 Roll Over Protection System (ROPS).

3.8 Falling Object Protection System (FOPS).

3.9 Seat belts with a dashboard audible warning and an external flashing light both of which indicate when the belt is not in use.

3.10 Tinted windows.

3.11 Ground level lockable isolation switch.

3.12 High Visibility “Keep away“ (in the relevant local language) signs at the back of the machine.

3.13 Ground Level fuelling point.

3.14 If more than two steps, access by an incline system (i.e. with an angle of inclination from the horizontal no greater than 75 degrees):

- First step to be rigid
- First step to be no more than 400mm off the ground

For vehicles over 20T, hydraulically powered access steps should be in place.

3.15 All operator cabins must be constructed so that the Noise Level within the cab is less than 80 dB(A).

3.16 Long life bulbs in the lighting system.

3.17 Warning indicators:

- Fuel Level and pressure
- Engine oil pressure
- Hydraulic oil level
- Engine air filter restriction
- Hydraulic filter bypass
- Service brake oil pressure
- Transmission filter bypass
- Engine inlet manifold temperature
- Hydraulic oil temperature

3.18 Safe Access must be provided for all Maintenance Operations - this includes safe access for checking of Daily Checks on Oil and fluid Levels e.g Sight gauges for fluid level checks.

3.19 An automatic Fire Suppression System (for units over 40T).

3.20 Training & Maintenance Training Requirements should also be specified.

3.21 Whole Body Vibration should be reduced through the use of vibration proof foundations or pads. The daily exposure limit value (standardised to an 8 hour reference) shall not exceed 1.15 m/s^2, and the daily exposure action value (standardised to an 8 hour reference) shall not exceed 0.5 m/s^2.

3.22 Access: First access step to be rigid and no more than 300mm off the ground. – TL to check with suppliers.

3.23 Access: Cab door shall be opened from a step of sufficient width for the placement of both feet no more than 500mm off the ground.

3.24 Access: Guard rails should ideally be 1200mm (minimum 1100mm).

3.25 Access: if a step has to be used for standing on for maintenance it must be at least 320mm wide so as to accommodate both feet beside each other and no more than 400mm from the ground.

3.26 Access: all machines to be fitted with an autolube system for all greasing points (except rotating prop shafts).

3.27 Radiators: A radiator cap with an effective depressurization interlock cap i.e to ensure the radiator pressure has been released before allowing removal of radiator cap; thus preventing scalds.

3.28 Communications in cab: dedicated location within cab for fixing communication equipment (to avoid retrofitting of equipment obscuring the driver's vision).

3.29 Bucket Hitch devices Quick hitch devices for the safe and easy removal / attachment of different sized buckets and rock breakers must be supplied as an integrated design. These devices must depend on either:

- Positive hydraulic pressure
- Mechanical locks OR
- Safety pins

to hold the buckets and other attachments in place.

The system in place must provide a visual and audible system to notify the driver when the lifting device is not correctly secured by the relevant mechanism.

3.30 When the driver's door is opened , an external light fitted adjacent to the cab door must activate , this is to cater for situations where the driver may be working in reduced light conditions.

3.31 Suitable dry powder fire extinguishers must be fitted in a secure and accessible manner on board.

3.32 Remote battery connection systems e.g Euro Battery Connectors (EBC) such as the Anderson switches to be fitted to allow jumpstarting and battery charging without having to access the battery area.

4.1 CE mark certificate (covering the forklift unit and lifting accessories supplied) and CE plate.

4.2 The operational speed of the forklift must be restricted through the vehicle management system to a maximum:

- Forward speed: 16km/h (10mph)
- Reverse speed: 5 km/h (3mph)

4.3 For forward and backward movement, a warning light system such as the Blue Light system must be installed.

4.4 A reverse warning alarm and reverse warning light must be fitted.

4.5 Air conditioning (this is only required in operations where process dust is created – it would not be required in Distribution operations). Our operations operate under an occupational exposure limit for respirable crystalline silica of 0.05 mg/m3 . All operator cabins must be constructed so as to prevent dust ingress, this should include the provision of air conditioning (using a HEPA (high-efficiency particulate air) filter)within the cab, and substantial sealing around windows and doors.

4.6 Roll Over Protection System (ROPS).

4.7 Falling Object Protection System (FOPS). only in circumstances where the vehicle may be used close to a working face , in such cases the absence of a FOPS structured must be clearly identified on the vehicle e.g large label within the driver's cab " This vehicle is not fitted with a FOPS structure").

4.8 Seat belts with a dashboard audible warning when the belt is not in use.

4.9 Tinted windows (only where required as a result of a site risk assessment).

4.10 The Operations & Maintenance Manuals must be supplied in English and the local language.

4.11 All operator cabins must be constructed so that the Noise Level within the cab is less than 80 dB(A).

4.12 Whole Body Vibration should be reduced through the use of vibration proof foundations or pads. The daily exposure limit value (standardised to an 8 hour reference) shall not exceed 1.15 m/s^2, and the daily exposure action value (standardised to an 8 hour reference) shall not exceed 0.5 m/s^2.

4.13 Training & Maintenance Training Requirements should also be specified.

4.14 Long life bulbs in the lighting system.

4.15 Ground level lockable isolation switch.

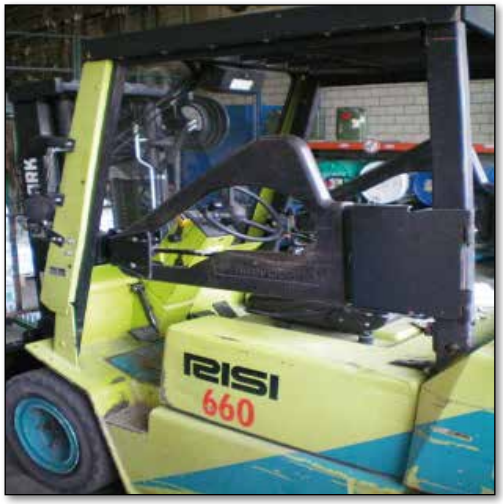
4.16 Warning indicators (where applicable):

- Fuel Level and pressure
- Engine oil pressure
- Hydraulic oil level
- Engine air filter restriction
- Hydraulic filter bypass
- Service brake oil pressure
- Transmission filter bypass
- Engine inlet manifold temperature
- Hydraulic oil temperature

4.17 Convex(Parabolic) / Concave driver mirrors mustn be fitted.

4.18 A keyless ignition system to prevent operation of the forklift by an unauthorised person must be fitted.

4.19 The forklift must be fitted with cab doors. The side guard system (see photo) is permitted for non-process Distribution activities.



5.1 A seat belt.

5.2 A cabtop flashing orange beacon.

5.3 Speed Control

- For reverse (load) movement (in the direction of the forks), the operating speed must be reduced through technical means on the reach truck drive system to 5km/h
- For forward (drive) movement, moving in the direction where the driver has a full unobstructed view, the operating speed must be reduced through technical means on the reach truck drive system to 13km/h)

5.4 Drive Control: this is a sensor which limits the speed of the reach truck to crawl speed when the mast is at close to full elevation.

5.5 CE mark certificate (covering the reach truck unit and lifting accessories supplied) and CE plate.

5.6 For forward and backward movement, a warning light system such as the Linde Blue Light system must be installed.

5.7 Falling Object Protection System (FOPS).

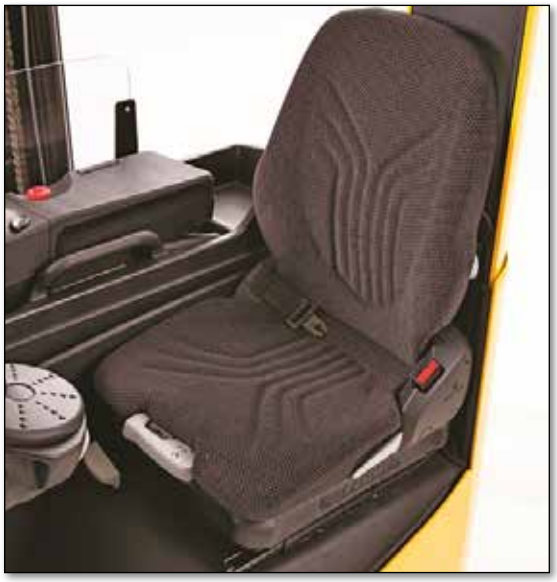
5.8 The Operations & Maintenance Manuals must be supplied in English and the local language.

5.9 Warning indicators (where applicable):

- Fuel Level and pressure
- Engine oil pressure
- Hydraulic oil level

5.10 As a fuel conservation option, an automatic engine switch off option should be considered as part of the specification.

5.11 A keyless ignition system to prevent operation ofthe forklift by an authorised person must be fitted.



6.1 CE mark certificate and plate.

6.2 A Concave mirror with an attached or integrated convex mirror.

6.3 A reverse warning alarm and reverse warning light must be fitted.

6.4 CCTV-System.

6.5 The Operations & Maintenance Manuals must be supplied in English and Russian.

6.6 Roll Over Protection System (ROPS).

6.7 Road Lights must be fitted.

6.8 Parking alarm.

6.9 Seat belts with a dashboard audible warning when the belt is not in use.

6.10 Tinted windows.

6.11 All operator cabins must be constructed so that the Noise Level within the cab is less than 80 dB(A).

6.12 Safe Access must be provided for all Maintenance Operations - this includes safe access for checking of Daily Checks on Oil and fluid Levels e.g Sight gauges for fluid level checks. Platforms for routine maintenance (including tasks such as cleaning windows or mirrors preferably carried out from ground level) at a height of between 1 and 2 metres above the ground or a safe working platform, shall have an anchorage point (or handhold or handrails capable of being used as an anchorage point) provided on the inside, so that a fall restraint device may be attached.

6.13 Whole Body Vibration should be reduced through the use of vibration proof foundations or pads. The daily exposure limit value (standardised to an 8 hour reference) shall not exceed 1.15 m/s^2, and the daily exposure action value (standardised to an 8 hour reference) shall not exceed 0.5 m/s^2.

6.14 Training & Maintenance Training Requirements should also be specified.

6.15 Long life bulbs in the lighting system.

6.16 Ground level lockable isolation switch.

6.17 Warning indicators:

- Fuel Level and pressure
- Engine oil pressure
- Hydraulic oil level
- Engine air filter restriction
- Hydraulic filter bypass
- Service brake oil pressure
- Transmission filter bypass
- Engine inlet manifold temperature
- Hydraulic oil temperature

6.18 Access: First access step to be rigid and no more than 300mm off the ground.

6.19 Access: Cab door shall be opened from a step of sufficient width for the placement of both feet no more than 500mm off the ground.

6.20 Access: Guard rails should ideally be 1200mm (minimum 1100mm).

6.21 Access: if a step has to be used for standing on for maintenance it must be at least 320mm wide so as to accommodate both feet beside each other and no more than 500mm from the ground.

6.22 Access: all machines to be fitted with an autolube system for all greasing points (except rotating prop shafts).

6.23 Radiators: A radiator cap with an effective depressurization interlock cap i.e to ensure the radiator pressure has been released before allowing removal of radiator cap; thus preventing scalds.

6.24 Communications in cab: dedicated location within cab for fixing communication equipment (to avoid retrofitting of equipment obscuring the driver's vision).

6.25 Suitable dry powder fire extinguishers must be fitted in a secure and accessible manner on board.

7.1 CE mark certificate and plate.

7.2 The Operations & Maintenance Manuals must be supplied in English and the relevant local language.

7.3 A Concave mirror with an attached or integrated convex mirror.

7.4 A reverse warning alarm and reverse warning light.

7.5 A lockout tagout mechanism for the electric generator.

7.6 Safe Access must be provided for all Maintenance Operations - this includes safe access for checking of Daily Checks on Oil and fluid Levels e.g Sight gauges for fluid level checks.

7.7 Warning alarm for screed movement.

7.8 Ground level lockable isolation switch.

7.9 Whole Body Vibration should be reduced through the use of vibration proof foundations or pads. The daily exposure **limit** value (standardised to an 8 hour reference) shall not exceed 1.15 m/s^2, and the daily exposure **action** value (standardised to an 8 hour reference) shall not exceed 0.5 m/s^2.

7.10 Long life bulbs in the lighting system.

7.11 Warning indicators:

- Fuel Level and pressure
- Engine oil pressure
- Hydraulic oil level
- Engine air filter restriction
- Hydraulic filter bypass
- Service brake oil pressure
- Transmission filter bypass
- Engine inlet manifold temperature
- Hydraulic oil temperature

7.12 Access: First access step to be rigid and no more than 300mm off the ground.

7.13 Access: Cab door shall be opened from a step of sufficient width for the placement of both feet no more than 500mm off the ground.

7.14 Access: Guard rails should ideally be 1200mm (minimum 1100mm).

7.15 Access: if a step has to be used for standing on for maintenance it must be at least 320mm wide so as to accommodate both feet beside each other and no more than 500mm from the ground.

7.16 Access: all machines to be fitted with an autolube system for all greasing points (except rotating prop shafts).

7.17 Radiators: A radiator cap with an effective depressurization interlock cap i.e to ensure the radiator pressure has been released before allowing removal of radiator cap thus preventing scalds.

7.18 Communications in cab: dedicated location within cab for fixing communication equipment (to avoid retrofitting of equipment obscuring the driver's vision).

7.19 Suitable dry powder fire extinguishers must be fitted in a secure and accessible manner on board

8.1 CE mark certificate and plate.

8.2 Rubber filled tyres.

8.3 Hose check valves for all hydraulic lines.

8.4 Protective structures (FOPS and ROPS) over the driver cabs.

8.5 A reverse warning alarm and reverse warning light. Red and White Chevrons to be painted on the counter weights or other suitable surfaces on the rear of each machine.

8.6 Concave and convex driver mirrors.

8.7 Tilt lock switch mechanism (which prevents the vehicle working on an unsafe gradient).

8.8 Overweight (over Safe Working Load) warning mechanism.

8.9 Air conditioned drivers cab.

8.10 Noise levels (in dBA) within the cab must not exceed 80dBA on average over an 8 hour working shift.

8.11 Lap strap type seat belts with a dashboard audible warning when the belt is not in use.

8.12 Tinted windows.

8.13 Ground Level fuelling point.

8.14 Whole Body Vibration should be reduced through the use of vibration proof foundations or pads. The daily exposure **limit** value (standardised to an 8 hour reference) shall not exceed 1.15 m/s^2, and the daily exposure **action** value (standardised to an 8 hour reference) shall not exceed 0.5 m/s^2.

8.15 Radiators: A radiator cap with an effective depressurization interlock cap i.e to ensure the radiator pressure has been released before allowing removal of radiator cap; thus preventing scalds.

8.16 Communications in cab : dedicated location within cab for fixing communication equipment (to avoid retrofitting of equipment obscuring the driver's vision).

9. New purchased Articulated Vehicles (including bulk Cement Tankers)

Articulated vehicles now represent a significant proportion of company fleets, which is partly due to the development of sliding bogies which allow the semi-trailer to be “shortened” for greater flexibility on sites while operating at the requisite overall lengths to comply with axle spacing to allow operation at maximum gross vehicle limits.

9.1 Lane Departure Warning (LDW).

9.2 Active Brake Assist (minimum class 3).

9.3 Tanker access platform and protective rail (cement Tankers)_
- Air operated with check valves

9.4 Tyre pressure monitoring system.

9.5 Side under run protection guards.

9.6 Handbrake warning alarm (when cab door is open and handbrake is not applied).

9.7 Markers on every bolt of the wheels to check if they are still properly fastened.

9.8 Audible “white noise” reverse Alarm.

9.9 Amber rotating beacon.

9.10 Seat belt for each seat.

9.11 Air conditioning.

9.12 Fire Extinguisher(s).

9.13 Anti-slips and treads. / Access steps, hand holds.

9.14 Daily Oil & Water checks and fills from ground level(where possible).

9.15 Anti-theft immobilisation.

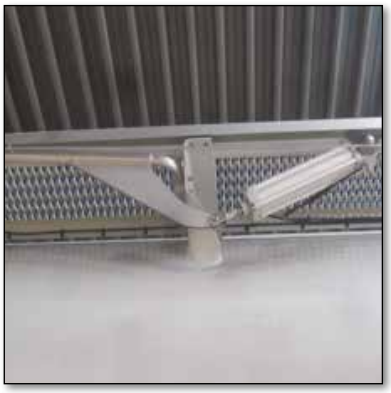
9.16 Tracking System.

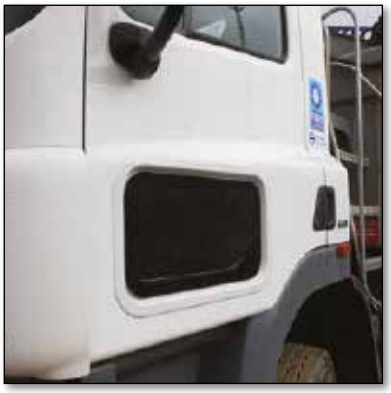
9.17 An inclinometer (where applicable).

9.18 Mechanical device for holding cab in position for maintenance.

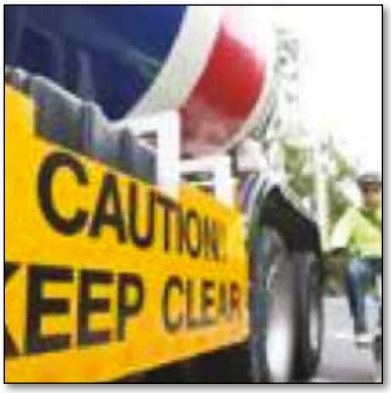
9.19 Blind spot elimination sensors for detection of pedestrians/cyclists when turning on the side away from the driver - for example left for UK (right hand drive) and right for Poland (left hand drive). Detection should trigger an alarm in the driver’s cabin.

9.20 All owned articulated vehicles must be fi tted with a CCTV or radar system to assist with reversing





Glass panel on passenger door to aid driver vision



Side under run protection guards

Inclinometer

10.1 360º CCTV system (4 cameras, one in-cab screen).

10.2 Lane Departure Warning (LDW).

10.3 Active Brake Assist (minimum class 3).

10.4 Tyre pressure monitoring system.

10.5 Side under run protection guards.

10.6 Handbrake warning alarm (when cab door is open and handbrake is not applied).

10.7 Markers on every bolt of the wheels to check if they are still properly fastened.

10.8 Audible “white noise” reverse Alarm.

10.9 Amber rotating beacon.

10.10 “Body-up/lock” audible indicator.

10.11 Seat belt for each seat.

10.12 Air conditioning.

10.13 Fire Extinguisher(s).

10.14 Anti-slips and treads. / Access steps, hand holds.

10.15 Daily Oil & Water checks and fills from ground level(where possible).

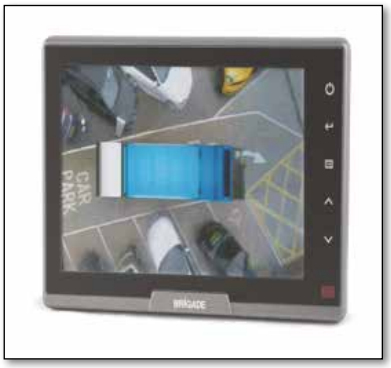
10.16 Anti-theft immobilisation.

10.17 Tracking System.

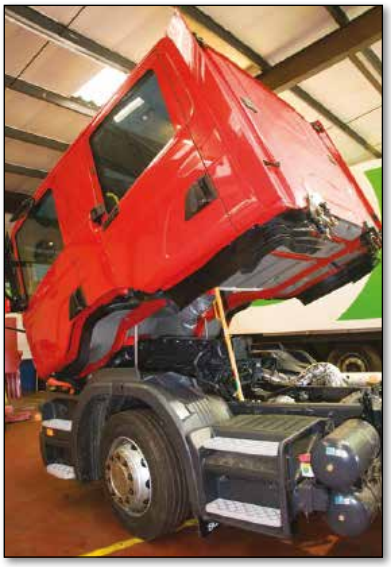
10.18 Inclinometer (where applicable).

10.19 Mechanical device for holding cab in position for maintenance.

10.20 Blind spot elimination sensors for detection of pedestrians/cyclists when turning on the side away from the driver - for example left for UK (right hand drive) and right for Poland (left hand drive). Detection should trigger an alarm in the driver’s cabin.



360o CCTV system
(4 cameras , one in-cab screen)



Mechanical restraint device for cab maintenance

11.1 360º CCTV system (4 cameras, one in-cab screen).

11.2 Lane Departure Warning (LDW).

11.3 Active Brake Assist (minimum class 3).

11.4 Tyre pressure monitoring system.

11.5 Side under run protection guards.

11.6 Handbrake warning alarm (when cab door is open and handbrake is not applied).

11.7 Markers on every bolt of the wheels to check if they are still properly fastened.

11.8 Audible “white noise” reverse Alarm.

11.9 Amber rotating beacon.

11.10 Seat belt for each seat.

11.11 Air conditioning.

11.12 Fire Extinguisher(s).

11.13 Anti-slips and treads. / Access steps, hand holds.

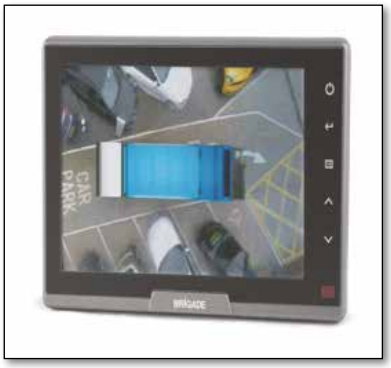
11.14 Daily Oil & Water checks and fills from ground level (where possible).

11.15 Anti-theft immobilisation.

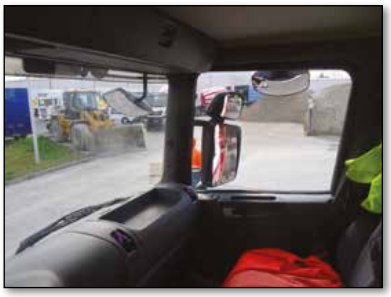
11.16 Tracking System.

11.17 Blind spot elimination sensors for detection of pedestrians/cyclists when turning on the side away from the driver - for example left for UK (right hand drive) and right for Poland (left hand drive). Detection should trigger an alarm in the driver’s cabin.

Drum spray cleaning system



360o CCTV system
(4 cameras, one in-cab screen)



12.1 Electrical pallet truck needs to be equipped with an active foot protection that stops driving and reverses for approximately 10 cm to prevent the feet from being trapped.

12.2 Emergency button on top of the operator bar.

12.3 Automatic braking when driver bar is released.

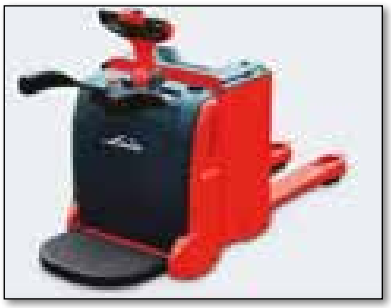
12.4 Speed limited to 6 km/h for pedestrian operated and 10km/h for stand on pallet trucks.

12.5 Stand on detection for stand on pallet trucks that disables the movements when the operator is not standing on the platform.

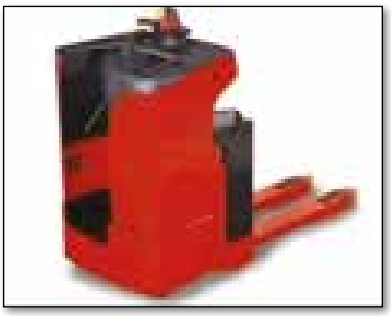
12.6 Stand on pallet trucks needs to have side protection for the driver.

12.7 Blue spot for forward movement on the stacker pallet trucks.

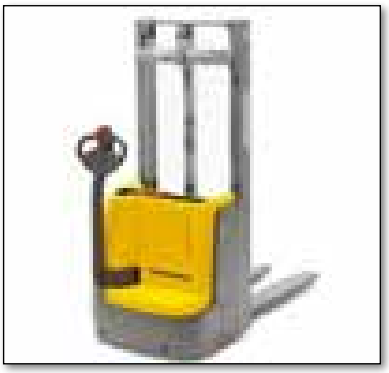
Active foot protection



Stand on Pallet Truck with side protection



Stand on Pallet Truck



Stacker Pallet Truck

EN-ISO12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction.
EN-ISO 13857:2008	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs.
EN 349 + A1	Safety of machinery - machinery - Minimum gaps to avoid crushing of parts of human body.
EN-ISO 13850:2006	Safety of machinery - Emergency stop - Principles for design (ISO 13850:2006,IDT).
EN547-1 + A:2008	Safety of machinery - Human body measurements - Part 1: Principles for determining the dimensions required for openings for whole body access into machinery.
EN547-2 + A:2008	Safety of machinery - Human body measurements - Part 2: Principles for determining the dimensions required for access openings.
EN574:1997 + A1:2008	Safety of machinery - Two-hand control devices - Functional aspects - Principles for design.
	Safety of machinery - Ergonomic design principles - Part 1: Terminology and general principles
EN 620:2002 + A1:2010	Continues handling equipment and systems - Safety and EMC requirements for fixed belt conveyors for bulk materials.
EN 618:2002 + A1:2010	Handling equipment and systems - Safety and EMC requirements for equipment for mechanical handling of bulk materials except fixed belt conveyors.
EN-ISO 13857:2008	Safety of machinery - Safety distances to prevent danger zones being reached by the lower limbs.
EN 842:1997 + A1:2008	Safety of machinery - Visual danger signals - General requirements, design and testing.
EN 953:1998 + A1:2009	Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards.
EN-ISO 13849 -1:2008	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design.
EN 981:1997 + A1:2008	Safety of machinery - System of auditory and visual danger and information signals.
EN-ISO 4413:2010	Hydraulic fluid power - General rules and safety requirements for systems and their components.
EN-ISO 4414:2010	Pneumatic fluid power - General rules and safety requirements for systems and their components.
EN 1032 :2003 + A1:2009	Mechanical vibration - Testing of mobile machinery in order to determine the vibration emission value.
EN1037:1996 + A1	Safety of machinery - Prevention of unexpected start-up.
EN-ISO12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction.
EN-ISO14119:2013	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection.
EN1299:1997 + A1:2009	Mechanical vibration and shock - Vibration isolation of machines - Information for the application of source isolation.

Machine Guarding Standards

EN-ISO 14122-1:200 + A1:2010	Safety of machinery - Permanent means of access to machinery - Part 1: Choice of fixed means of access between two levels.
EN-ISO 14122-2:2001 + A1:2010	Safety of machinery - Permanent means of access to machinery - Part 2:Working platforms and walkways.
EN-ISO 14122-3:2001 + A1:2010	Safety of machinery - Permanent means of access to machinery - Part 3: Stairs, stepladders and guard-rails.
EN-ISO 14122-4:2005 + A1:2010	Safety of machinery - Permanent means of access to machinery - Part 4: Fixed ladders.
EN-ISO 3450:2011	Earth-moving machinery - Wheeled or high-speed rubber-tracked machines - Performance requirements and test procedures for brake systems.
EN-ISO 6683:2008	Earth-moving machinery - Seat belts and seat belt anchorages - Performance requirements and tests.
EN-IEC 60204 -1:2006	Safety of machinery - Electrical equipment of machines - Part 1: General requirements.
ISO 14118:2000	Safety of machinery - Prevention of unexpected start-up.

Specific Machine Standards

EN500-1	Mobile road construction machinery – Safety part 1 : common requirements.
EN500-1	Mobile road construction machinery – Safety part 2 : specific requirements for road milling machines.
EN500-6	Mobile road construction machinery – Safety part 6 : specific requirements for paver-finishers.
EN12609	Truck Mixers – Safety requirements.

Draft

Safety Element/Addition to Contracts

1.1.1 A transport contractor for CRH shall on signing the contract agree to the following requirements :

1.1.1. Must pass an initial safety **prequalification process in accordance with Life Saving Rule No.1** . This prequalification will cover areas such as driver selection and training , vehicle safety systems etc (as outlined in LSR 1 in the 16 LSR)

1.1.2. Must comply with CRH driver and vehicle safety requirements and the key aspects covered in the **" CRH Transport Safety Checks "** which cover verification of the following

1. That the driver of the contract vehicle has conducted a daily prestart check of the vehicle before the commencement of his shift
2. That the driver has the required personal protective equipment in the vehicle
3. That the reverse warning system is in working order
4. That a pedestrian mirror is fitted to the front windscreen of the vehicle
5. That a handbrake warning alarm is in place where if the driver door is opened an alarm will sound if the handbrake is not engaged *
6. To have side under run protection guards with combined pedestrian/cyclist warning sign *

* required by January 1st 2017

1.1.3 All vehicles purchased by the Transport Contractor after the date of this contract must comply with the **safety specifications** outlined in relevant heavy goods vehicle section the **CRH Red Book** (guidance on procurement)

1.1.4 If the Transport contractor fails to pass any element of the CRH Transport Safety Check – they shall be liable for a **financial penalty** . The system of financial penalty will be decided by the relevant opco .

Example

- Failure of a CRH Transport Safety Check : €100 (and dismissal from site if non-compliance is deemed by local management to be serious)

1.1.5 Additional fines , as defined by the opco may also be put in place

1.1.6 The Transport Contractor will be required to be attend and participate in ongoing Driver health initiatives ,