

# **DYNAPAC**

## **RISK ASSESSMENT**



## **SELF PROPELLED COMPACTORS TYPES CP 03/132/142/205/215/221/271**

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# DYNAPAC AUSTRALIA PTY LTD RISK ASSESSMENT

## Self Propelled Compactors CP 03/132/142/205/215/221/271

### OBJECTIVE:

The objective of the **Risk Assessment** is to protect the health and safety of persons from all reasonably foreseeable *hazards* arising from Plant, Systems of Work and Use of such Plant as supplied by Dynapac Australia Pty Ltd

- Ensuring that all reasonably foreseeable *hazards* associated with the use of Dynapac plant are identified as is reasonably practicable and is assessed and controlled.
- Compliance with the OH&S Act 2000 and the OH&S Regulation 2001.
- Provision of relevant information and training

### COMMENTARY:

Employers have obligations under the *Occupational Health and Safety Regulation 2001* to identify any foreseeable hazards that may arise in the workplace and to assess the risk of harm arising from the identified hazards.

Employers then have an obligation to eliminate the hazards. If this is not “reasonably practicable” they must control the risk by implementing measures to lessen the risk of harm to the lowest possible level.

Dynapac has an obligation under Chapter 5 of the *Occupational Health and Safety Act 2000 & the OH&S Regulation 2001* to provide its customers with a risk assessment covering the following;

- Division 2 - Design of plant
- Manufacturer of plant
- Sale of Plant

The attached Risk Assessment covers this obligation in respect of Plant provided in Australia by Dynapac Australia Pty Ltd.

Dynapac has made every effort possible to provide all the information necessary to identify any reasonably foreseeable hazards that will impact on the use of its plant and on its customers operations and is based on a range of environmental and operational conditions in which

the plant is designed to operate viz.: highway, streets, roads & parking lots, construction and maintenance, large building foundations, airfields, dams, other construction site services & landscaping. *They are not intended for site clearing, overhead demolition or forestry.* As the operation and use of self propelled Compactors may introduce hazards which are site specific, it is the responsibility of the owner/operator to carry out site specific Job Safety & Environment Analysis (JSEA) as identified in the risk assessment.

To assist in this, a standard JSEA form is provided as part of the Risk Assessment package.

In order to fore fill Dynapac's obligation in the ongoing review of the Risk Assessments, the owner/operator of the plant is required to provide to Dynapac, information about the design, manufacture or use of the plant, any faults that have the potential to harm the safety or health of any person.

Where additional faults & resulting potential *hazards* are identified, which result from any accident investigations and incident reports (including near misses), which may indicate that the risk assessment is no longer valid, a Risk Action Plan should be put in place to eliminate or control the risk and a copy should be provided to Dynapac for its risk assessment review.

In addition any Plant faults should be recorded on a Plant Fault Report which is to be submitted to Dynapac & is included in the package.

A proforma action plan is provided, as part of the Risk Assessment package for the owners/ operators use.

## **DISCLAIMER:**

Every effort has been made to identify the causes of hazards that pose a risk to the health & safety of the people which may come in contact with the plant supplied by Dynapac. Risk Management covers a diverse range of risks from commercial & legal relationships to management activities & controls. The intent of this assessment is to identify those areas which pose a threat to health & safety.

A risk assessment is part of the process of Risk Management, it is an interactive process consisting of steps which, when undertaken in sequence, enable improvement in decision making. It requires a high degree of monitoring & follow up. As the use of Dynapac equipment can cover a diverse range of situations, it is not always possible to foresee all sources of risk. Owners & Operators are encouraged to continually update Dynapac with information which may impact on the safe use of the plant & to keep abreast of the legislative requirements as applied to Plant.

Dynapac reserves the right to make changes with out notice. Photos & illustrations do not always show standard versions of the plant.

Material contained in this assessment does not imply or contain warranties of any kind.

## **DEFINITIONS:**

**Hazard-** A source of potential harm or a situation with a potential to cause injury or illness.

**Risk-** The chance of something happening that will have an impact upon company objectives.

**Risk Assessment-** The process used to determine the risk management control measures by evaluating and comparing the level of risk against predetermined standards, target risk levels and other criteria.

Where additional hazards are identified, which result from any accident investigations and incident reports (including near misses) which may indicate that the risk assessment is no longer valid, a Risk Action Plan should be put in place to eliminate or control the risk and a copy should be provided to Dynapac for its risk assessment review. A proforma action plan is provided, as part of the Risk Assessment package for the owners/ operators use.

## **How to use the Risk Assessment:**

The following risk assessment is formatted by:

Hazard Category, (as the page heading), for example Slipping tripping and falling.

Each causal factor is then given an item No.

The cause is identified in the next column with the red heading.

The risk level is ranked, “L”, low or “H” High.

The next column is to provide a revision reference.

The central column highlighted in green, list the control measures in place or that need to be implemented to eliminate or minimise the hazard.

The control reference columns highlighted in blue, indicated the reference in the Safety Manual, Operation Manual, and the Maintenance Manual.

Clauses are indicated such; 1.5, page numbers 18/ or page and clause numbers 3/5 and service hrs 250hr. The last column indicates the relevant standards, which pertains to the control of the hazard.

**DYNAPAC AUSTRALIA PTY LTD RISK ASSESSMENT**  
**Self Propelled Compactors CP 03/132/142/205/215/221/271**  
**INDEX OF SIGNIFICANT HAZARDS**  
**Hazards, hazardous situations and hazardous events**

Item	Hazard	Standard EN 500-1:2001
<b>1</b>	<b>MECHANICAL HAZARDS</b> due to:	<b>8</b>
	-machine parts & work pieces, e.g.: shape, location, mass & stability, mass & velocity, mechanical strength.	
	-accumulation of energy inside the machine e.g.: springs, liquids & gases under pressure, effect of vacuum.	<b>5.10.2</b> <b>5.10.3</b>
	-crushing hazard	<b>5.3.2, 5.9.2</b>
	-shearing hazard	<b>5.3.1, 5.9</b>
	-cutting or severing hazard	<b>5.3.1</b>
	-drawing in or severing hazard	<b>5, 5.2.4, 5.9</b>
	-impact hazard	<b>5.9</b>
	-stabbing or puncture hazard	<b>5.9</b>
	-friction or abrasion hazard	<b>5.10.1</b>
	-high pressure fluid injection or ejection hazard	<b>5.10.1, 5.10.3</b>
	<b>-ELECTRICAL HAZARD</b> Due to:	
	-contact of persons with live parts	<b>5.15.3, 5.15.4, 5.15.5, 5.15.6, 5.15.7</b>
	-electrostatic phenomena	<b>5.15, 5.16</b>
	-Thermal radiation or other phenomena such as projection of molten particles & chemical effects from short circuits & overloads.	<b>5.14, 5.15</b>
<b>3</b>	<b>THERMAL HAZARDS</b> , resulting in:	
	-burns scalds & other injuries by a possible contact of persons with objects or materials with an extreme high or low temperature, by flames or explosions & by radiation of heat sources	<b>5.10.1, 5.11, 5.12, 5.14</b>
	Damage to health by hot or cold working environments	<b>5.3.2</b>
<b>4</b>	<b>HAZARDS GENERATED BY NOISE</b> resulting in:	
	-hearing loss & other physiological disorders e.g.: loss of balance, loss of awareness.	<b>5.17.6</b>
	-interference with speech communication, acoustic signals, etc.	<b>5.13.1</b>

# DYNAPAC AUSTRALIA PTY LTD RISK ASSESSMENT

## Self Propelled Compactors

### INDEX OF SIGNIFICANT HAZARDS

#### Hazards, hazardous situations and hazardous events

Item	Hazard	Standard EN500-1:2001
<b>5</b>	<b>HAZARDS GENERATED BY VIBRATION</b>	
	-whole body vibration, particularly when combined with poor postures	<b>5.17.3, 5.17.4, 6</b>
<b>6</b>	<b>HAZARDS GENERATED BY RADIATION</b>	
	-low frequency, radio frequency radiation, micro waves	<b>5.16</b>
	-infrared, visible & ultraviolet light	<b>5.5.2.5</b>
	-laser	<b>5.5.2.5</b>
<b>7</b>	<b>HAZARDS GENERATED BY MATERIALS &amp; SUBSTANCES</b> , processed or used by the plant:	
	-hazards from contact with/or inhalation of harmful fluids, gases, mists, fumes & dusts	<b>5.3.2, 5.14</b>
	-fire or explosion hazard	<b>5.11, 5.14</b>
<b>8</b>	<b>HAZARDS GENERATED BY NEGELECTING ERGONOMIC PRINCIPLES IN MACHINERY DESIGN AS</b> , e.g. hazards from:	
	-unhealthy postures or excessive effort.	<b>5.3, 5.4, 5.5</b>
	-inadequate consideration of hand-arm or foot leg anatomy.	<b>5.3, 5.4, 5.5</b>
	-neglected use of personal protection equipment	<b>6</b>
	-inadequate local lighting.	<b>5.3.2</b>
	-mental stress	<b>5.17,6</b>
	-human error, human behavior	<b>5.5 to 5.18</b>
	-inadequate design, location or identification of manual controls.	<b>5.3 to 5.8</b>
	-inadequate design or location of visual display units.	<b>5.5</b>
	-neglecting principals of safety integration	<b>5.2, 5.3.2, 5.5, 5.7.5</b>
	-inadequate guards and protection devices	<b>5.3.2, 5.9</b>
	-inadequate operating position	<b>5.3, 5.4, 5.5</b>
	-inadequate design of adjustment , service & maintenance places & access to these places	<b>5.5</b>



# DYNAPAC AUSTRALIA PTY LTD RISK ASSESSMENT

## Self Propelled Compactors

### INDEX OF SIGNIFICANT HAZARDS

#### Hazards, hazardous situations and hazardous events

Item	Hazard	Standard EN500-1:2001
9	<b>COMBINATION OF HAZARDS</b>	5.3.1
10	<b>UNEXPECTED START-UP, UNEXPECTED OVERRUN/OVERSPEED</b> (or similar malfunction ) from:	
	-failure/disorder of the control system	5.5
	-external influences on control system or electrical systems	5.15, 5.16
	- errors in soft ware	5.5, 5.15, 5.16
	-errors made by the operator ( due to mismatch of human characteristics & abilities)	5.5, 5.6, 5.7, 5.8
11	<b>IMPOSSIBILITY OF STOPPING THE PLANT IN THE BEST POSSIBLE CONDITION</b>	5.5, 5.7
12	<b>FAILURE TO ADEQUATELY REPAIR &amp; MAINTAIN THE PLANT</b>	
13	<b>FAILURE OF THE POWER/ENERGY SUPPLY</b>	5.5, 5.15
14	<b>FAILURE OF CONTROL CIRCUIT</b>	5.5, 5.15
15	<b>ERRORS OF FITTING</b>	5.10.1
16	<b>FAILURE TO PROVIDE &amp; WEAR PERSONAL PROTECTION EQUIPMENT</b>	6
17	<b>FALLING OR EJECTED OBJECTS OR FLUIDS</b>	5.10
18	<b>MAINTENANCE OF CONTROL MEASURES &amp; SYSTEMS OF WORK</b>	
19	<b>SLIP,TRIP&amp; FALL OF PERSONS</b> ( related to the plant )	5.5.2.7, 5.8
<b>ADDITIONAL HAZARDS, HAZARDOUS SITUATIONS &amp; HAZARDOUS EVENTS DUE TO THE MOBILE NATURE OF THE PLANT</b>		
20	<b>HAZARDS RELATING TO THE TRAVELLING FUNCTIONS OF THE PLANT</b>	
	-movement of the plant when starting the engine	5.6
	-movement without the driver in the driving position	5.5.2.4, 5.5.2.6
	-movement without all guards and parts in position	5.5.2.4, 5.5.2.8
	-traveling function	5.2.3, 5.5, 5.6, 5.7
	-excessive oscillation when moving	5.2.3
	-insufficient ability of the plant to be slowed down, stopped & immobilized	5.7
	-remote control	5.5.2.5

# DYNAPAC AUSTRALIA PTY LTD RISK ASSESSMENT

## Self Propelled Compactors

### INDEX OF SIGNIFICANT HAZARDS

#### Hazards, hazardous situations and hazardous events

Item	Hazard	Standard EN500-1:2001
<b>21</b>	<b>HAZARDS LINKED TO THE WORK POSITION ( including driving position )</b>	
	-fall of persons during access to ( or at/from ) the drive/work position(s)	<b>5.8</b>
	-Exhaust gases/lack of oxygen at the driving/work position	<b>5.3.1, 5.9.1, 5.14</b>
	-fire ( flammability of the cab, lack of extinguishing means )	<b>5.11</b>
	-roll over	<b>5.10 of EN500-4</b>
	-insufficient visibility from the drive/work position(s)	<b>5.3.1</b>
	Inadequate drive/work lighting	<b>5.1</b>
	-inadequate seating	<b>5.4</b>
	-noise at the drive/work position(s)	<b>5.17</b>
	-vibration at the drive/work position(s)	<b>6</b>
	-insufficient means of evacuation/emergency exit	<b>5.3.2</b>
<b>22</b>	<b>HAZARDS DUE TO THE CONTROL SYSTEM</b>	
	-inadequate design of energy/control circuits	<b>5.2.3, 5.5, 5.6, 5.7, 5.15</b>
	-inadequate design of the location of manual controls	<b>5.5, 5.6, 5.7</b>
	-inadequate design of the manual controls & their mode of operation	<b>5.5.2</b>
<b>23</b>	<b>HAZARDS DUE TO THE STABILITY OF THE PLANT</b>	<b>5.2.6</b>
<b>24</b>	<b>HAZARDS DUE TO THE POWER SOURCE AND THE TRANSMISSION OF POWER</b>	
	-hazards from the engine & the batteries	<b>5.6.3, 5.15.4, 5.15.5</b>
	-hazards from transmission of power between machines	
	-hazards from retrieval, transportation, lifting & towing	<b>5.2.1</b>
<b>25</b>	<b>HAZARDS TO &amp; FROM THIRD PERSONS</b>	
	-unauthorised startup/use	<b>5.6.2</b>
	-movement of the plant or part of the plant from its stopping position	<b>5.5.2.8</b>
	-lack of/or inadequacy of the visual or acoustic warning devices or means	<b>5.13</b>

# DYNAPAC AUSTRALIA PTY LTD RISK ASSESSMENT

## Self Propelled Compactors

### INDEX OF SIGNIFICANT HAZARDS

#### Hazards, hazardous situations and hazardous events

Item	Hazard	Standard EN500-1:2001
26	INSUFFICIENT INSTRUCTIONS FOR THE DRIVER/OPERATOR & SERVICE PERSONAL due to:	5.13, 5.17.2, 6
	-lack of safety, operating & maintenance manuals	
	-inadequate or lack of warning signs & markings	
	-lack of training	
	-inadequate supervision	
	-review of site specific operations and preparation of JSEA	

# DYNAPAC AUSTRALIA PTY LTD RISK ASSESSMENT WORKSHEET

**Assessment No: CP 03/132/142/205/215/221/271-236-130**

**Date of Assessment: August 2004**

**Plant Description: Self Propelled Compactors Type CP03/132/142/205/221/271**

**HAZARD CATEGORY: SLIPPING, TRIPPING AND FALLING.**

Can anyone using the plant, or in the vicinity of the Plant, slip, trip or fall due to:

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard EN500-1-02 As noted
1	Uneven or slippery work surfaces	L		Non slip self cleaning access steps Operator Platforms fitted within anti- slip material. Two point access hand rails. Always use the three point grip when entering or exiting machine. Clean boots of mud & debris. Keep cab area clean.	Pages 1-18 1.5 5.9	Pages19-37 3/5 18/		5.3.1 5.8 ISO; 2860 ISO 2867

## RISK ASSESSMENT, Slipping, tripping & falling continued.

Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
2	Spillage of chemicals or lubricants	L		Ensure chemicals and lubricants are stored correctly. Provide correct dispensing equipment. Provide facilities for draining of fluids. Clean up all spills immediately Provide PPE as appropriate	Pages 1-18 2.1.1 4 5.4 5.9		Pages 38-63 Pages 38-63	
3	Lack of correct hand rails & steps	L		Three point grip design provided with self cleaning steps	3/ 1.5 5.9	3/5		5.3.1 5.8 ISO 2860 ISO 2867
4	Poor house Keeping	L		Ensure cab is kept clean and free of loose objects. Ensure all operational surfaces are kept clean & free of derbies	9/, 1.13 2.1.1 5.9	3/13		
5	Falling from a Height	L		For access to high points of the machine use a work platform or approved ladder. Do not work from non working surfaces. Always use three point grip for accessing and exiting machine				
6	Holes, penetration or gaps	L		Always ensure cover plates and access covers are in place before operating the machine	3/,11/ 2.1 2.1.1			
7	Collapse of supporting structure	L		Machine designed to international standards for ROPS. Always wear seat belts when operating machine Check ROPS.	2.1.3 5.7	11/		5.10 of EN5 500- 4
8	Site Conditions as appropriate	L		Supervisor to assess & control operations & complete JSEA				
9	Ignorance of safety Operating & Maint Instructions	L		Ensure correct operator training and assessment. Maintain operator log book. Be familiar with safety, operating and maintenance manuals	See Manual	See Manual	See Manual	5.13, 5.17. 2 6

## HAZARD CATEGORY: CUTTING, STABBING AND PUNCTURING

Can anyone be cut, stabbed or punctured due to?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			Standard
		L/H			Safety Manual	Operation Manual	Maint Manual	
1	Coming into contact with sharp or flying objects	L		Ensure that machine is free of all loose objects. Check work area for debris or tools or equipment that may be thrown up, or dislodged by the plant. Ensure guards are in place, cab is in good order, and glass is clean & not cracked. Toughened glass installed in cab	9/ 2.1.4	3/13		5.3.1 5.9 ISO 3457
2	Coming into contact with moving parts of the plant during testing, inspection, operation, maintenance cleaning or repair of the plant	L		Ensure that all guards are in place especially after maintenance operations. Ensure rigid locking device is used on articulated plant during maintenance and lifting. Warning Decals are placed to warn of potential Hazard. Ensure decals are in place & legible	11/ 1.15 25/		38/	5.8 5.3.2 5.9 SO3457 EN294
3	The plant, or parts of the plant disintegrating	L		Ensure all moving parts are guarded				ISO3457
4	The mobility of the plant	L		Fitment of; reverse alarms and beacons. Test operation at the commencement of each operational period.	3/ 7/2.1.1	3/1-15		5.5 5.6.1 5.6.2 5.7

## RISK ASSESSMENT, cutting, stabbing & puncturing continued

Item No	Causes	Risk	Rev	Control measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
5	Uncontrolled or unexpected movement of the plant	L		Installation of: Emergency stop switch (E/S). Neutral start function; After operation of E/S, control lever must be in neutral before E/S is reset to enable forward or reverse motion. Engine to be started with E/S on Fail safe starting and operating system viz; Engine will start with E/S in and drive lever in neutral but forward and reverse motion is prevented. Engine Will not start with control in forward or reverse. Engine failure- brake on. Hydraulic pressure failure- brake on. Electrical failure- brake on.	2.2	7/ 13/ 17/ 18/		5.5 5.6.1 5.6.2 5.7
6	Site conditions as appropriate	L		Supervisor /operator to assess & control operations & complete JSEA	2.1.4			
7	Ignorance of safety Operating & Maint Instructions	L		Ensure correct operator training and assessment. Maintain operator log book. Be familiar with safety, operating and maintenance manuals	Sections 1 thru 5	Pages 1-21 Pages 1-37	Pages 1-23 Pages 38-63	5.13 5.17.2 6

## HAZARD CATEGORY: SHEARING

Can anyone's body parts be sheared?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			Standard
		L/H			Safety Manual	Operation Manual	Maint Manual	
1	Between two parts of the plant	H		Ensure warning decals are in place. Ensure plant is locked & tagged out	11/,12/ 1.15	17/-18/ 4/-5/		5.3.1 5.9 5.13.2
2	Between the plant and a structure	L		Maintain clearances to fixed structures. No passengers allowed on plant Only trained and competent operators to operate plant. ROPS should always be used Avoid operating on risky ground Drive slowly on sharp bends Avoid driving at an angle on slopes Adhere to all operating instructions Use correct transport techniques Adhere to repair and operating procedures Barricade & sign working area	1.1,1.3 1.6,1.7 1.7,1.8 1.91. 2.1.2 2.1.4 2.3.2 2.3.3 2.4.2 3.1,,2,,3, .4,	Pages1-37		
3	Site Conditions as appropriate	L		Supervisor /operator to assess & control operations & complete JSEA	2.1.4			
4	Ignorance of safety Operating & Maint Instructions	L		Ensure correct operator training and assessment. Maintain operator log book. Be familiar with safety, operating and maintenance manuals	Pages 1-18 Sections 1 thru 5	Pages 1-37 Pages 1-21	Pages 38-63 Pages 1-24	5.13 5.17.2 6



## HAZARD CATEGORY: ENTANGLEMENT

Can anyone's hair, clothing, gloves, cleaning brushes, rags, other cleaning material, necktie or jewelry become entangled?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/B			Safety Manual	Operation Manual	Maint Manual	Standard
1	With moving parts of the plant	L		Only fully trained and competent operators and service personnel to operate and work on the plant Wear approved work wear. Use all PPE as required Do not wear loose clothing or jewelry when operating or working on the plant Ensure long hair is adequately restrained	13/2.1	3/1 to 18		5, 5.2.4 5.9
2	Site conditions	L		Supervisor / operator to; assess & control specific site conditions	2.1.4			

## HAZARD CATEGORY: CRUSHING

Can anyone be crushed due to?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Material falling off the plant	L		Ensure all tools and equipment and loose items are removed from the plant prior to use	2.1.1	3/1 to 18		5.3.2 5.9.2
2	Uncontrolled or unexpected movement of the plant	L		Installation of: Emergency stop switch (E/S). Neutral start function; After operation of E/S, control lever must be in neutral before E/S is reset to enable forward or reverse motion. Engine to be started with E/S on Failure safe starting and operating system viz; Engine will start with E/S in and drive lever in neutral but forward and reverse motion is prevented. Engine will not start with control in forward or reverse. Engine failure brake on. Hydraulic pressure failure brake on. Electrical failure brake on.	2/ 2.2.1	28/-30/ 9/, 16/, 17/, 19/, 20/,		5.5 5.6.1 5.6.2 5.7
3	Lack of capacity for the plant to be slowed, stopped or immobilised	L		Installation of: Emergency stop switch (E/S). Neutral start function; After operation of E/S, control lever must be in neutral before E/S is reset to enable forward or reverse motion. Engine to be started with E/S on Failure safe starting and operating system viz; Engine will start with E/S in and drive lever in neutral but forward and reverse motion is prevented. Engine Will not start with control in forward or reverse. Brake on due to failure of Engine, Hydraulics or electric's. Hydrostatic transmission brakes the plant when the control lever is moved towards the neutral position.	2/ 2.2.1	28/-30/ 9/, 16/, 17/, 19/, 20/,		5.5 5.6.1 5.6.2 5.7
4	The plant tipping or rolling	H		Follow all safety and operating instruction for working on difficult terrain. Only fully trained & competent operators to operate plant	5/ Safety manual	28/-30/ 22/, 21/		5.5 to 5.8

## RISK ASSESSMENT, crushing continued

Item	Causes	Risk	Rev	Control measures to reduce Hazard	Control Reference			
					Safety Manual	Operation Manual	Maint Manual	Standard
5	Parts of the plant collapsing	L		All plant fitted with approved safety cab & ROPS. When engine struts are removed ensure engine hood is securely propped open. Gas struts fitted with mechanical locking device	5.7	18/	28/33/	5.10.2, .3 EN500-4
6	Coming into contact with moving parts of the plant during testing, inspection, operation, maintenance, cleaning or repair	H		Only fully trained and competent operators and service personnel to operate and work on the plant Wear approved work wear. Use all PPE as required Do not wear loose clothing or jewelry when operating or working on the plant Ensure long hair is adequately restrained Ensure articulation lock is in place. Plant to be locked & tagged out	2/ 1,2,5,			5.10, 8,
7	Being thrown off or under the plant	H		All CP type Compactors fitted with ROPS & or safety cab. Operators to wear safety belts All personnel to keep clear of working plant No passengers allowed on the plant Barricade and sign post all working areas Follow safety and operating instructions when working on difficult terrain	2/,4/,5/, 6/, 1.12	18/		5.8
8	Being trapped between the plant and fixed structures			Maintain clearances to fixed structures. No passengers allowed on plant Only trained and certified operators to operate plant. ROPS should always be used Avoid operating on risky ground Drive slowly on sharp bends Avoid driving at an angle on slopes Adhere to all operating instructions Use correct transport techniques Adhere to repair and operating procedures Barricade & sign working area	1.1,1.3 1.6,1.7 1.7,1.8 1.91. 2.1.2 2.1.4 2.3.2 2.3.3 2.4.2 3.1,,2,,3, .4,	20/ 25/ 27/		5.13
9	Ignorance of safety Operating & Maint Instructions	L		Ensure correct operator training and assessment. Maintain operator log book. Be familiar with safety, operating and maintenance manuals	Safety Manual	Operation Manuals	Maint Manual	5.13, 5.17.2 6

## RISK ASSESSMENT, crushing continued

Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
10	Failure of hydraulic steering	H		Only operate plant at recommended speeds	2/	28/-29 20/		
11	Site conditions	H		Supervisor / operator assess & control operations & complete JSEA	2.1.4	3/		

## HAZARD CATEGORY: FRICTION

Can anyone be burnt due to?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Coming into contact with moving parts or surfaces of the plant or material handled by the plant	L		Supervisor & operator to; assess & control for site conditions. Conduct task specific JSEA	2.1.4			5.10.1
2	Ignorance of Safety Operating & Maint Instructions	L		Ensure correct operator training and assessment. Maintain operator log book. Be familiar with safety, operating and maintenance manuals	Safety Manual	Operation manual	Maint Manual	5.13 5.17.2 6

## HAZARD CATEGORY: STRIKING

Can anyone be struck by moving objects due to?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Uncontrolled or unexpected movement of the plant	L		Installation of: Emergency stop switch (E/S). Neutral start function; After operation of E/S, control lever must be in neutral before E/S is reset to enable forward or reverse motion. Engine to be started with E/S on Failure safe starting and operating system viz; Engine will start with E/S in and drive lever in neutral but forward and reverse motion is prevented. Engine Will not start with control in forward or reverse. Engine failure- brake on. Hydraulic pressure failure- brake on. Electrical failure- brake on.	28/-30/	9/, 16/, 17/, 19/, 20/,		5.5 5.6.1 5.6.2 5.7
2	The plant or parts of the plant disintegrating	L		Ensure all moving parts are guarded & guards are replaced after inspection, testing servicing and maintenance	13/ 2.1.1			ISO345 7
3	Mobility of the plant			Fitment of motion alarms and beacons				5.2.7 to 5.7
4	Ignorance of Safety Operating & Maint Instructions	L		Ensure correct operator training and assessment. Maintain operator log book. Be familiar with safety, operating and maintenance manuals	Safety Manual	Operation Manual	Maint Manual	
5	Site conditions	H		Supervisor & operator to; assess & control for site conditions. Conduct task specific JSEA	2.1.4			5.13 5.17.2 6

## HAZARD CATEGORY: HIGH PRESSURE FLUID

Can anyone come into contact with fluids under high pressure due to?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Failure of the plant	H		Pipes fittings and hoses are installed in such a manner that they are protected against mechanical and or thermal damage. Pressure lines passing near the operator's station are installed or covered in such away that the operator is protected in the event of a failure and or rupture in the installation.	13/ 5.4			5.10.1 5.10.3
2	Failure of hydraulic steering			Operate plant at recommended speeds				
3	Misuse of the plant	L		Ensure correct operator training and assessment. Maintain operator log book. Be familiar with safety, operating and maintenance manuals. Reassess levels of operator and maintenance personal competencies	Safety Manual	Operation Manual	Maint Manual	5.10.2 5.10.3
4	Ignorance of safety Operating & Maint Instructions	L		Ensure correct operator training and assessment. Maintain operator log book. Be familiar with safety, operating and maintenance manuals. Reassess levels of operator and maintenance personnel competencies	Safety Manual	Operation Manual	Maint Manual	5.13 5.17.2 6

## HAZARD CATEGORY: ELECTRICAL

Can anyone be injured by electrical shock or burnt due to?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Contact of persons with live parts	L		Supervisor & operator to; assess & control for site conditions. Conduct task specific JSEA	2.1.4			5.15.3 5.15.4 5.15.5 5.15.6 5.15.7
2	Electrostatic phenomena	L		Avoid insulating materials in work clothes, wear only cotton or wool clothing				5.15 5.16
3	Thermal radiation emanating from effects of short circuits and overloads	L		Power systems of plant are all extra low voltage DC and are protected by ELCB's or fuses. Protection devices are protect by covers to eliminate thermal problems or projection of molten particles				5.15 5.16
4	The plant conducting live electrical conductors	L		Supervisor & operator to; assess & control for site conditions. Conduct task specific JSEA Maintain 6m clearance from o/h power lines Isolate or insulate power systems & power lines	2.1.4			5.15 5.16
5	The plant working in close proximity to electrical conductors	L		Supervisor & operator to; assess & control for site conditions. Conduct task specific JSEA Barricade and sign post work area Maintain clearance to power lines, isolate or insulate power systems	2.1.4			5.15 5.16
6	Site conditions	L		Supervisor & operator to; assess & control for site conditions. Conduct task specific JSEA	2.1.4			



## HAZARD CATEGORY: EXPLOSION

Can anyone be injured by explosion of gases, vapors, liquids, dusts or other substances?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Triggered by the operation of the plant or during inspection and maintenance:	L		When refueling take all precautions as out lined in safety manual When servicing batteries follow safety and maintenance instructions. Engage a tyre workshop for service and repair to tyres or use certified tyre fitter. Do not carry out weld repairs to rim with tyre fitted Do not weld on tanks or vessels unless correctly drained, cleaned and vented & appropriate procedures are in place.	17.4			5.11, 5.14
2	Incorrect storage of flammable material	L		Always store flammable material in approved cabinets. Maintain store quantities as low as possible.	5.1			
3	Maintenance cleaning	L		Never use petrol as a cleaning agent. Use only approved cleaning fluids in conjunction with approved cleaning equipment. No smoking or naked flames	5.1			
4	Maintenance welding	L		Do not weld on tanks or vessels unless correctly drained, cleaned and vented & appropriate procedures are in place.	5.1			
5	Starting in cold climates using starter leads and auxiliary battery.	L		Strictly follow starting instructions in safety manual. Do not use "Aerostart" or other ether based starting aids or flammable mists or fluids in air intake to assist starting.	2.2.3			

## HAZARD CATEGORY: ERGONOMIC

Can anyone be injured due to?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Unhealthy posture postures or excessive efforts	L		The safety cab is designed to conform to a high level of visibility; with the sloping engine hood the view to the rear is considerably improved. Cab windows are tinted to improve visibility in sunny conditions. The fresh-air installation incorporates filtered input air, water-borne heating & defroster nozzles are provided for both front & rear windows & heat vents are provided near the floor to maintain an even & comfortable temperature. Window washer and wipers are provided on both front & rear windows. Slope of the steering wheel is infinitely adjustable for best driving posture and a slewing control unit is provided. This means that the steering wheel, seat & controls can be rotated in a single unit to give the best view & posture				5.3,5.4 5.5 EN25353 EN23411 ISO6682
2	Inadequate consideration of hand-arm or foot-leg anatomy	L		Cab & control designed and configured to comply with best practice ergonomic principles and to standard				5.3,5.4 5.5
3	Neglecting to use PPE	L		Ensure personnel are trained in the use of PPE. Ensure PPE is suitable for the working conditions likely to be encountered	1.15,2.1			6
4	Inadequate local lighting	L		Ensure plant lighting is operative. Install additional temporary lighting to suit site requirements				5.3.2

## RISK ASSESSMENT, ergonomic continued.

Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
5	Operator stress	L		The safety cab is designed to conform to a high level of visibility; with the sloping engine hood the view to the rear is considerably improved. Cab windows are tinted to improve visibility in sunny conditions. The fresh-air installation incorporates filtered input air, water-borne heating & defroster nozzles are provided for both front & rear windows & heat vents are provided near the floor to maintain an even & comfortable temperature. Window washer and wipers are provided on both front & rear windows. A/C is provided. Slope of the steering wheel is infinitely adjustable for best driving posture and a slewing control unit is provided. This means that the steering wheel, seat & controls can be rotated in a single unit to give the best view & posture				5.17,6
6	Human error, human behavior	L		No horse play allowed. Never operate plant whilst intoxicated by alcohol or drugs, or affected by medicine.	2.1			5.5 to 5.18
7	Inadequate design location & identification of controls	L		All control locations are configured on best practice ergonomic principals and to standards. Identification symbols are illustrated in the safety, operation & maintenance manuals. Use only fully trained operators, service & maintenance personnel. Assess personnel competencies before assigning work	1.3			5.3 to 5.8
8	Inadequate design or location of visual display's	L		Location designed to ergonomic principles and to standard. Locations are illustrated in the safety, operation & maintenance manuals. Use only fully trained & competent operators, service & maintenance personnel. Assess operator competencies before assigning work				5.5

## RISK ASSESSMENT, ergonomic continued

Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
9	Neglecting principles of safety integration	L		The relationship between safety, availability & ergonomics have been optimised such that safety measures will be maintained during the life time of the plant & does not tempt personnel to defeat safety systems				5.2,5.3.2 5.5,5.6 5.7,6
10	Inadequate guards & protection devices	L		Guards are designed to confirm to standards. Warning decals are used to reinforce hazard locations				5.3.2,5.9
11	Inadequate operating position	L		The safety cab is designed to conform to a high level of visibility; with the sloping engine hood the view to the rear is considerably improved. Cab windows are tinted to improve visibility in sunny conditions. Water-borne heating & defroster nozzles are provided for both front & rear windows. Window washer and wipers are provided on both front & rear windows. Slope of the steering wheel is infinitely adjustable for best driving posture and a slewing control unit is provided. This means that the steering wheel, seat & controls can be rotated in a single unit to give the best view & posture				5.3,5.4 5.5
12	Inadequate design for serviceability	L		Daily service points are few and easily accessible. The large easy to open engine hood contributes to the accessibility. The number of lubrication points has been reduced to a minimum, at the same time as the periods between servicing has been extended. Service points such as air filters, oil filters and oil changes are located and configured to facilitate easy accessibility.				5.8

## HAZARD CATEGORY: SUFFOCATION

Can anyone be suffocated due to?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Lack of oxygen, contamination from exhaust gases or atmospheric contamination	L		<p>Cab and ventilation system including AC comply to standards</p> <p>No welding near plastic, rubber or polyurethane materials.</p> <p>When operating plant indoors connect exhaust pipe to extraction system.</p> <p>If not possible ensure area is provided with air circulation and noxious gas levels and oxygen levels are monitored. The necessary facilities and systems of work are provided and maintained so as to minimise risks to the health &amp; safety of persons operating, maintaining, inspection or cleaning the plant.</p>	5.1			5.3.1,5.9.1 5.14 EN292.2
2	Operating plant in confined spaces	H		Do not operate Plant in confined spaces. Seek specialist advice on specific site conditions especially deep excavations such as building foundations.				

## HAZARD CATEGORY: HIGH TEMPERATURE OR FIRE

Can anyone come into contact with?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Objects at high temperature	L		When servicing or inspecting engines which have been operating be aware of the high temperature components such as the exhaust system and engine coolant system	5.3			5.10,5.11 5.12,5.14
2	Fire in cab	L		The materials of cab construction are made of fire resistant material with a maximum burning rate 250mm/min				ISO 3795
3	Servicing of batteries	L		Ensure correct systems of work are in place and only competent person service the batteries. Follow safety procedures as out lined in safety and operating manual	5.5			5.11, 5.14
4	Refueling	L		Follow safety systems of work as per the safety and maintenance manuals.	4			5.11, 5.14
5	Welding			When welding on the machine, disconnect battery's negative cable & all electrical connections to alternator, VBS relay, and dash panel & compaction meter. No welding near plastic, rubber or polyurethane materials. Ensure adequate fire fighting equipment is available.	5.1			5.11, 5.14
	Smoking	H		No smoking when refueling or servicing batteries or in situations that are present a situation for fire. Follow job site & company policy on smoking.	1.14, 5.5			5.11, 5.14
6	Incorrect cleaning procedures	H		Never use petrol as a cleaning agent. Use only approved cleaning fluids in conjunction with approved cleaning equipment. No smoking or naked flames	5.1			5.11, 5.14
7	Cold starting with starter leads & auxiliary battery	L		Strictly follow starting instructions in safety manual Do not use "Aerostart" or other ether based starting aids or flammable mists or fluids in air intake to assist starting.	All			5.11, 5.14
8	Inadequate storage of flammable materials	H		Ensure flammable materials quantities are kept to a minimum and always stored in approved flammable storage systems.	5.1			5.11, 5.14

## HAZARD CATEGORY: THERMAL HAZARDS

Can anyone suffer ill health due to?

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Exposure to high or low temperatures	L		Plant is fitted with fully enclosed safety cab with ventilation systems designed for the environmental conditions of use. The safety cab gives the operator good protection against wind and rain. Owner and operator to assess suitability for operating in the site environmental conditions				5.10.1 5.11 5.12 5.14
2	Burns or scalds	L		Follow safety, operating and maintenance manuals when: Servicing coolant system. Servicing AC system. Servicing battery and electrical systems. Servicing lubrication & hydraulic systems. When engine hood is open exposing hot engine system components. Wear appropriate PPE. Only fully trained and certified operators, service and maintenance personnel to carry out work.	5.3	3/		5.10.1 5.11 5.12 5.14
3	Cold burns	L		In sub zero environmental conditions do not touch bear metal with exposed fingers. Wear appropriate PPE. Take care when servicing AC systems				5.3.2

## HAZARD CATEGORY: OTHER HAZARDS

Can anyone be injured or suffer ill health due to?

RISK ASSESSMENT								
No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Noise of plant or associated site equipment	H		The noise level for the operator is comfortably low with the safety cab supplied. Supervisor & operator to; assess site specific conditions as the noise level may vary depending on what material the plant is working on & any associated plant working in close proximity. Follow site rules	1.15			5.17.6
2	Vibration	L		The plant features very low vibration levels in the operator's position achieved through rubber suspension of the operator's platform, cab, drum and diesel engine.				5.17.3 5.17.4 6
3	Low frequency, radio frequency or micro waves	L		Avoid extended use of mobile phones & two-way radios. Do not turn on two-way radios when blasting is taking place. Turn off two-ways & mobile phones when refuelling				5.16
4	Infrared, visible & ultraviolet light	L		Use appropriate PPE to protect personal from exposure to excessive level of sun light. Cab glass tinted. Extra levels of tint can be supplied				5.5.2.5
5	Unexpected start up, overrun /over speed due to failure of control system	L		Control system configured for fail safe operation. All plant is fitted with "fail-safe" brakes that are automatically applied if the engine stops or in the event of hydraulic or electrical faults. Engine to run at full RPM to ensure correct operation of the hydrostatic braking.				5.5
6	Unexpected start up, overrun, overspend due to external influences on electrical equipment	L		All plant is fitted with "fail-safe" brakes that are automatically applied if the engine stops or in the event of hydraulic or electrical faults				5.15,5.1 6



## RISK ASSESSMENT, other hazards continued

Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
7	Unexpected start up, overrun, overspend due to errors in soft wear	L		All plant is fitted with “fail safe” brakes that are automatically applied if the engine stops or in the event of hydraulic, electrical or software faults.				5.5,5.15 5.16
8	Unexpected start up, overrun, overspend due to errors made by the operator.	L		Ensure only competent personnel operate, test, service and maintain the plant. Follow all instructions contained in the safety, operating & maintenance manuals	1.3,2.1.2			5.5,5.6 5.7,5.8
9	Fitting errors	L		Ensure only competent personnel operate, test, service and maintain the plant. Always check plant for fitness to operate before work. Testing, service & maintenance personnel to ensure that all components are secure in place before operating	1.3,2.1 2.1.1 2.1.2			5.10.1
10	Movement when starting engine	L		Follow starting instructions, make sure that the parking brake (emergency stop) is activated and that all controls are operative	2.2.1	16/17/18/19		5.6
11	Movement with out driver in position	L		All plant is fitted with “fail-safe” brakes that are automatically applied if the engine stops or in the event of hydraulic or electrical faults. Seat is fitted with alarm buzzer to indicate driver not in seated position with ignition on & brake off. Test operation with ignition on, engine off & brake off before operating plant	2.4.2			5.5.2.4 5.5.2.6
12	Movement with out all parts in position	L		Ensure only competent personnel operate, test, service and maintain the plant. Always check plant for fitness to operate before work. Testing, service & maintenance personnel to ensure that all components are secure in place before operating	1.3,2.1 2.1.1 2.1.2			5.5.2.4 5.5.2.8
13	Excessive oscillation when moving	L		Plant is fitted with compound hitch (cross type); this ensures accurate tracking between wheels & drum. A swivel seat aids operator control. Computer controlled hydraulic anti-spin system optimises the propulsion hydraulics which monitors and adjusts the hydraulics to achieve the best possible torque and maneuverability				5.2.3

## RISK ASSESSMENT, other hazards continued

Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
14	Inability of plant to be slowed down stopped or immobilised	L		The control system incorporates an emergency braking system. All plant is fitted with "fail-safe" brakes that are automatically applied if the engine stops or in the event of hydraulic or electrical faults				5.7
15	Insufficient visibility from the drive /work position	L		The safety cab is designed to conform to a high level of visibility, with the sloping engine hood the view to the rear is considerably improved. Cab windows are tinted to improve visibility in sunny conditions. Water-borne heating & defroster nozzles are provided for both front & rear windows. Window washer and wipers are provided on both front & rear windows. Slope of the steering wheel is infinitely adjustable for best driving posture and a slewing control unit is provided. This means that the steering wheel, seat & controls can be rotated in a single unit to give the best view & posture. Wash windows prior to use & keep clean during use.				5.3.1
16	Inadequate means for evacuation / emergency exit			Safety cabs are fitted with quick release rear window for emergency exiting. A hammer is provided, located on the right rear cab post which is used to break a window in case of emergencies				5.3.2
17	Lack of stability	L		A very low center of gravity gives the rollers good stability. Compound articulated steering ensures accurate tracking between drum & wheels. To ensure the optimum pulling force, the wheels usually fitted together with the PD drum have tyres with tractor type, thick diagonal tread. Follow safety driving instructions for difficult terrain	1.9,1.10 1.11, 2..1.4 2.3.2 2.3.2			5.2.6
18	Handling of the plant due to power source and transmission of power	L		Optional computer controlled hydraulic anti-spin system optimises the propulsion hydraulics which monitors and adjusts the hydraulics to achieve the best possible torque and maneuverability for compaction on steep slopes & difficult ground. To ensure the optimum pulling force, the wheels usually fitted together with the PD drum have tyres with tractor type, thick diagonal tread. Follow safety driving instructions for difficult terrain				5.6.3 5.15.14 5.15.5

## RISK ASSESSMENT, other hazards continued

Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
19	Retrieval, lifting, transportation and towing	L		Follow detailed procedures in safety manual	3.1 to 3.5			5.2.1
20	Unauthorized start-up/use	L		Engage emergency brake before alighting from cab. Lock cab, remove battery isolation switch from under engine hood and lock engine hood. Chock roller and lower strike off blade if fitted. Switch amplitude selector to off.	2.4.2			5.6.2
21	Insufficient instructions for the operator, service & maintenance personnel	L		Ensure only fully trained & competent personnel operate, test, service & maintain the plant. Provide information & training to employees, supervisors & managers. Make sure everyone knows what the risks & their controls are, & what practices must be followed	1.3			5.13 5.17.2 6
22	Lack of record keeping	L		Report all accidents, incidents & near misses. Follow up with corrective action. Review preventative measures when new information is obtained about previously unknown fault or hazard & after all accidents. Copy to Dynapac service manager Maintain records relating to health & safety issues of the plant. Transfer records on the sale of the plant unless the plant is sold for scrap or as spare parts for another piece of plant				
23	Vibration selector not set to off when loading or unloading causing failure of loading equipment.	H		Ensure vibration/amplitude selector switch is set to "off" prior to starting engine at all times & especially prior to any loading operations.	3.1			

## HAZARD CATEGORY: DUTIES OF ALL PERSONS

Persons must not:

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Willfully or recklessly interfere with or misuse anything provided in the interests of health and safety or welfare in pursuance of any requirement in the OH&S Act and Regulation 2001	L		Treat the plant with due care. Report all defects and problems no matter how small. Follow the safety, operating & maintenance manuals. Be correctly trained and be competent in the work tasks assigned. Do not interfere with safety equipment or make any alterations to the plant with out approval.	2.1.2			5.3.1,5.9.1 5.14 EN292.2
2	Willfully place at risk the health and safety of any person at the workplace	L		Be competently trained and follow all the safety rules. Review each job task before commencing work. Supervisors are accountable for making sure that preventative measures are understood, are monitored & are working	2.1.2			5.5 to 5.8
3	Employees not complying, to the extent that they are capable, with all the activities carried out in accordance with the provision of the OH&S Act and regulation 2001	L		Ensure all plant personnel are fully trained & competent. Ensure that they know the potentially harmful effects that may arise from the use of the plant. Personnel must be able to recognise the physical 'warning' signs if their health may be affected by work involving the plant eg. dizziness from fumes, fatigue from high temperatures. Supervisors are accountable for making sure that preventative measures are understood, are monitored & are working	2.1.2			

## RISK ASSESSMENT, duties of all persons continued

Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
4	Employees must report promptly to their employer any matters of which they are aware that may affect the employer's compliance with the provisions of the OH&S Act & Regulation 2001	L		Details of the safety, operating & maintenance manuals, & emergency procedures are fully understood by all persons. Provide refresher training to all persons in operational and emergency procedures, especially after any accident or incident.	2.			5.5 to 5.8

## HAZARD CATEGORY: CONTROL

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Lack of control measures & safe systems of work	L		Review the hazards & ensure safe systems of work are in place	All	All	All	
2	Failure to supervise the use of PPE	L		Ensure correct supervision is in place & personnel are trained in the correct use of PPE	All	All	All	
3	Failure to remove persons from identified situations that are reported to be hazardous	L		Review all accident, incidents & near misses & stop work or control the situation to eliminate or reduce the risk				
4	Failure to carry out JSA's	L		Always review each job situation & complete a JSEA				
5	Failure to report & follow up on incident and accidents including near misses	L		Report all accidents, incidents & near misses. Follow up with corrective action				
6	Failure to ensure that only competent personal are used to , operate, test, service & maintain the plant	L		Ensure only fully trained & competent personnel are used to operate, inspect, test & maintain the plant. Regularly reassess & provide refresher training for all personnel.	All	All	All	
7	Inadequate medical competencies of operators	H		Ensure operators undergo annual checks for cardiac & other medical conditions which affect the operators capacity to operate the plant in a safe manner				
8	Failure to maintain records	H		Records should be kept of risk assessments, accidents & incidents including near misses, maintenance & repair, training, inspections & tests & any other certification required				

## HAZARD CATEGORY: USE

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Operation of plant by a person that has not received adequate information and training and is not supervised to the extent necessary to minimise risks to health & safety	L		Ensure that all personal are provided with the safety, operational, & maintenance manuals & are trained to achieve the correct level of competency. Retrain if required after any accidents & incidents including near misses. Maintain operators log book.	1.3			5.13 5.17.2 6
2	Failure to assess job specific criteria & risks	L		Always carry out site specific JSEA	2.1.1, 2.1.3, 2.1.4			
3	Incorrect use of PPE	H		PPE is only effective if used in the correct manner. Ensure operators are trained in their correct use.	2.1			
4	Incorrect use of Plant	L		Ensure plant is only used for the purpose for which it is designed				
5	Unauthorised alteration or repair of the plant	L		Ensure no unauthorised alteration or repair is made to the Plant. Always consult Dynapac.	2.1.2			5.6.2
6	Use of unsafe Plant	L		If the plant becomes unsafe, stop it from being used until the risks have been eliminated or (if this is not practicable) controlled. Ensure routine maintenance, inspections & tests are carried out.	1.4			

## HAZARD CATEGORY: ENVIRONMENT

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Excessive Noise	H		CA type Plant are designed such as to achieve low noise levels				5.17, 6 5.13.1
2	Fluid spills during servicing & refueling	H		Filters for hydraulic fluid, engine oil & fuel are located where they are easy to reach & cause the least possible spill. Do not overfill. Always wipe up spilt fluids	4., 5.4			5.8
3	Lack of maintenance	L		Hydraulic hoses deteriorate with age. Examine hoses regularly, replace with original hoses from Dynapac if uncertain as to the durability or wear	5.4			5.10.2 5.10.3
4	Incorrect setting of hydraulic system	L		Make sure pressure settings are correct. Too high a pressure can lead to hose rupture.	5.4			5.10.2 5.10.3
5	Incorrect disposal of fluids & filters			Dispose of all fluids & filters in an approved manner. CA machines are designed to use optionally available biologically degradable hydraulic oil.				



## HAZARD CATEGORY MAINTENANCE & REPAIR

RISK ASSESSMENT								
Item No	Causes	Risk	Rev	Control Measures To Reduce Hazard	Control Reference			
		L/H			Safety Manual	Operation Manual	Maint Manual	Standard
1	Inadequate facilities & systems of work	L		Provide the necessary facilities & ensure that the necessary systems of work are in place for the safety of the persons doing the work.				
2	Work not carried out in accordance with procedures	L		Ensure work is done in accordance with procedures recommended by the supplier			All	
3	Failure to maintain safety features	L		Make sure that all safety features & warning devices are maintained & tested	All	All	All	
4	Damaged plant	H		Seek Dynapac's advice before carrying out repairs Make sure that a competent person assesses & provides advice on damaged plant, & undertakes repair, inspection & testing work. Never repair a ROPS/FOPS after its been damaged	1.17			
5	Plant is not stopped & isolated during maintenance & repair	H		Make sure that during maintenance, cleaning & repair, the plant is stopped, isolated & tagged, & and devices and safe systems of work are used to safeguard the people doing the work	All	All	All	
6	Incorrect use of compressed air	H		Use appropriate PPE when using compressed air. Never use compressed air to clean down your self or other persons				

## JOB SAFETY & ENVIRONMENT ANALYSIS

<b>JOB SAFETY &amp; ENVIRONMENT ANALYSIS TITLE</b>	Page.....of.....JSEA.	DATE:	JSEA NO.
	Company:	Name:	I acknowledge that I am aware of my (my organisation's) Obligations under the OH&S Act 2000 & OH&S Regulation2001. <b><i>JSEA completed by (Company Rep)</i></b> :.....
	Location of Work:	Waste Service Contact:	
<b>Required Personal Protective Safety Equipment</b>			<b><i>JSEA Reviewed by;</i></b> :.....
			Based on the information supplied in the JSEA and on the Review process, the work is authorised to proceed ( <b><i>Manager or an authorised Representative</i></b> ): :.....
<b>SEQUENCE OF BASIC JOB STEPS</b>	<b>POTENTIAL HAZARDS</b>	<b>RECOMMENDED ACTION OR PROCEDURE</b>	
Break the job down into steps. Each of the steps should Accomplish some major task and be logical.	Identify the hazards associated with each step. Examine each to find possibilities that could lead to an accident.	Using the first two columns as a guide, decide what actions ARE necessary to eliminate or minimise the hazards that could Lead to an accident, injury, occupational illness or Environmental harm.	

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**RISK ACTION PLAN**

<b>ITEM RISK</b>	<b>REF:</b>
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**SUMMARY-RECOMMENDED RESPONSE AND IMPACT:**

- 1. PROPOSED ACTION:**
- 2. RESOURCE REQUIREMENTS:**
- 3. RESPONSIBILITIES:**
- 4. TIMING:**
- 5. REPORTING AND MONITORING REQUIRED:**

<b>COMPILER:</b>	<b>DATE:</b>	<b>REVIEWER:</b>	<b>DATE:</b>
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<b>PLANT FAILURE REPORT</b>		To:									
<b>Responsible:</b>	<b>Report Date:</b>	<b>Failure Report No:</b>									
<b>For Info:</b>	<b>Failure Date:</b>	<b>Yr. Ref:</b>									
<b>Person Reporting:</b>	<b>State:</b>	<b>End User:</b>									
<b>Plant Type</b>	<b>Plant Serial No.:</b>	<b>Operating Hours:</b>									
<b>Broken Part:</b>	<b>Part No:</b>	<b>Part Serial No.:</b>									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; padding: 5px;"> <b>Earlier Problem</b>            Yes <input type="checkbox"/>      No <input type="checkbox"/> </td> <td style="width: 33%; padding: 5px;"> <b>Common Application</b>  <input type="checkbox"/>s                      <input type="checkbox"/> </td> <td style="width: 33%;"></td> </tr> <tr> <td style="padding: 5px;"> <b>Ambient Temperature</b>            Below 0C <input type="checkbox"/>            0 to 15 C <input type="checkbox"/>            16 to 35 C <input type="checkbox"/>            36 c &amp; over <input type="checkbox"/> </td> <td style="padding: 5px;"> <b>Ambient condition</b>            Normal <input type="checkbox"/>            Dusty <input type="checkbox"/>            Wet <input type="checkbox"/> </td> <td style="padding: 5px;"> <b>Material</b>            Base coarse      Sand            Sub-base          Silt            Rock fills        Clay            Gravel             Asphalt         </td> </tr> <tr> <td style="padding: 5px;"> <b>Vibration Amplitude</b>            Low   25%   50%   75%   High  <input style="width: 100%; height: 15px;" type="text"/> </td> <td style="padding: 5px;"> <b>Part no</b>  <input style="width: 100%; height: 20px;" type="text"/> </td> <td style="padding: 5px;"> <b>Failure Code</b>  <input style="width: 100%; height: 20px;" type="text"/> </td> </tr> </table>			<b>Earlier Problem</b> Yes <input type="checkbox"/> No <input type="checkbox"/>	<b>Common Application</b> <input type="checkbox"/> s <input type="checkbox"/>		<b>Ambient Temperature</b> Below 0C <input type="checkbox"/> 0 to 15 C <input type="checkbox"/> 16 to 35 C <input type="checkbox"/> 36 c & over <input type="checkbox"/>	<b>Ambient condition</b> Normal <input type="checkbox"/> Dusty <input type="checkbox"/> Wet <input type="checkbox"/>	<b>Material</b> Base coarse      Sand Sub-base          Silt Rock fills        Clay Gravel             Asphalt	<b>Vibration Amplitude</b> Low   25%   50%   75%   High <input style="width: 100%; height: 15px;" type="text"/>	<b>Part no</b> <input style="width: 100%; height: 20px;" type="text"/>	<b>Failure Code</b> <input style="width: 100%; height: 20px;" type="text"/>
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<b>Description of Problem:</b>											
<b>Probable Cause of Problem:</b>											
<b>Indications prior to failure:</b>											
<b>Actions from Dynapac:</b>											
<b>Risk Assessment updated:</b> Yes <input type="checkbox"/> No <input type="checkbox"/> <b>Date:</b>											