	Standard Operating Procedure		
	Procedure Name:	Use of bulk material devices – Kibbles	
	Author:	Steve Smallman	
	Approved By:	Albie Wheeler	
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Risk Assessment	Name	RA SOP 12 Kibble Operations	
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1. Aim of procedure

To identify and formalise the risks and control processes involved in the use of kibbles for the handling of bulk materials.

2. Scope of application

All Wheeler Cranes personnel involved in the use of kibbles to move materials on sites.

3. References

AS 2550.5

Kibble manufacturers operations instructions

4. Pre-requisites

Crane Drivers undertaking this work must hold:

- A National Certificate of Competency/High Risk Work Licence for the size and type of crane used
- A vehicle drivers licence of a suitable class for the crane used.
- A Wheeler Cranes Verification of Competency as a crane driver

Dogmen undertaking this work must hold a National Certificate of Competency/High Risk Work Licence as a dogman, and where supplied by Wheeler Cranes a Wheeler Cranes Verification of Competency.

Kibbles must be fitted with dedicated lifting points, a tare weight, a prominently displayed working load limit, handles to enable operation from outside the radius of the kibble and be provided with an operations manual for the make and model of kibble supplied.

5. Procedure

Wheeler Cranes personnel will:

1. Inspect the kibble prior to use to ensure that lifting points are in good working order and condition.

2. Inspect the operation of the unloading handles to ensure they operate freely when activated.
3. Inspect the operation of the unloading handles to ensure that safety interlocks are fitted and operational to prevent accidental discharge of the kibble.
4. Confirm the density of the material being lifted.
5. Confirm the operating radii and maximum lift at each radius.
6. For each lift, fill the kibble to the required depth only. See attachment 1 for method of calculating fill depth.
7. Identify slew path and load path and establish personnel exclusion zones.
8. Inspect slew path for close approach to power lines or other conductors. Install slew limiters, de-energise and isolate as necessary. Operations in accordance with close approach principles including spotter if required.
9. Test load kibble at minimal radius and check load is within calculated mass.
10. Test operation of kibble handle under load.
11. Move the kibble in close proximity to personnel only under direct control of the appointed dogman.
12. Ensure personnel are not between the suspended kibble and any fixed object or structure, or any unprotected void.
13. Ensure personnel involved in positioning and unloading kibble wear gloves and. Personnel must not place hands between suspended kibble and any fixed structure.
14. Not de-rig the kibble until they have ensured that the kibble is secure and not able to fall onto personnel.

In addition, our clients personnel must ensure:

15. Persons unloading kibble have secure footing prior to attempting to operate handle
16. Persons unloading kibble have unobstructed vision of the dump point and must ensure that no person will be injured by falling material.

6. Approval

Albie Wheeler
Managing Director
13/9/12

7. Acknowledgement

Name	Signature	Name	Signature

Attachment 1

Calculating fill depth

1. Calculate the volumes of material that will be lifted at each radius by use of the following formula. Note that a 25% safety factor has been added to the calculation:

   Where:

   WLL is the load limit at operating radius for the crane used
   M_{kibble} is the tare mass of the kibble
   D is the density of the material lifted in t/m^3
   V is the volume to be lifted

   $V = (WLL - M_{kibble}) \times 75\% / D$

   e.g. Where the WLL of the crane is 2t, the kibble weighs 1t, and the material has a density of 1.4 t/m^3

   $V = (2-1) \times .75/1.4$

   $= 0.54\ m^3$ rounded

2. Calculate the depth of fill for each volume. The following assumes the kibble is shaped as a perfect cone.

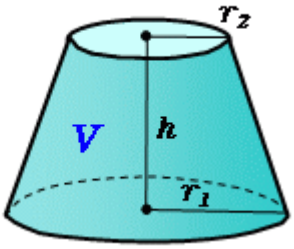
   Volume of a cone is found by the found by the formula $V=\pi r^2 h/3$
   Where:
   π is the constant pi
   r is the radius of the base (1/2 the diameter)
   h is the height of the cone

   In applying this to a kibble, where the cone has been truncated (or had its top cut off) the formula is
   $V= \pi(r_1^2 + r_1 x r_2 + r_2^2)h/3$

Therefore, fill depth h can be determined by

$h = 3V/ \pi(r_1^2 + r_1 x r_2 + r_2^2)$

Where



e.g.

Required volume is 0.54 m^3 the kibble is 1.2m across the upper opening, 0.3m across at the lower opening

Therefore r1=0.6, r2=0.15, V = 0.54

h = 3x0.54/3.14x(0.6x0.6+0.6x0.15+0.15x0.15)

= 1.62/3.14x(0.36+.09+.02)

= 1.62/1.48

= 1.09m

Therefore, to achieve a volume of 0.54m^3, a fill depth of 1.09m is required.