



# **WENDOVER ARM TRUST**

## **METHOD STATEMENT FOR BENTOMAT DISPENSER**

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## Document Location

The editable version of this document is held by the Wendover Arm Trust Health & Safety Coordinator. It is available to all members of the Wendover Arm Trust and the public via the Wendover Arm Trust's website:

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## Revision History

Issue	Date	Author	Summary of changes
Issue 1	1/8/2021	M Wright	First issue
Issue 2	22/12/21	M Wright	Re-issued in light of experience & add requirement for specially trained excavator operators

## 1. Purpose

- 1.1. To set out how the Bentomat dispenser (also known as the 'Bentomatic') is to be used to safely lay Bentomat on the 45° (nominal) banks of the canal between Bridge 4 and Little Tring.
- 1.2. This document will be further updated in the light of experience in using the Bentomat dispenser as required.

## 2. Scope

2.1. This document covers all operations involving using the Bentomat dispenser including:

- Inserting the core tube into the Bentomat roll.
- Attaching the dispenser lifting beam to the excavator.
- Attaching the core tube & Bentomat roll to the lifting beam.
- Lifting the Bentomat roll and slewing it into the start position.
- Initially securing the 'loose end' of the Bentomat roll.
- Unrolling the Bentomat and securing it to the bank.
- Removing the Bentomat dispenser.

2.2. This document performs the function of a lifting plan for lifting Bentomat rolls with the Bentomat dispenser.

2.3. This document assumes that the excavator using the Bentomat dispenser is a 13-tonne machine with a quick-hitch with or without a quick-hitch override.

**Note that 5 and 8-tonne machines are NOT able to use the Bentomat dispenser safely.**

## 3. Definitions

HSE	Health & Safety Executive
LOLER	Lifting Operations & Lifting Equipment Regulations
WAT	Wendover Arm Trust.
Over-end	Refers to lifting or other excavator operations where the jib is over the end of the vehicle tracks.
Over-side	Refers to lifting or other excavator operations where the jib is over the side of the vehicle tracks.

## 4. Reference & Related Documents

4.1. Legislation

Lifting Operations & Lifting Equipment Regulations (LOLER) 1998

4.2. Guidance

CETCO "BENTOMAT® INSTALLATION GUIDELINES" – Manufacturer's guidance

4.3. Related Documents

JCB Quick Start Guide – Tracked Excavators 210X/220X (same cab layout as 131X)

## 5. Basic Data

5.1. Weights

Bentomat roll (full)	1.3 tonnes (approx.)
Dispenser core tube	180kg (approx.)
Dispenser lifting beam	200kg (approx.)
Total	1.7 tonnes (approx.)

## 5.2. Lifting radius

Lifting radius when laying Bentomat: up to 4m at varying heights above ground.

## 5.3. Dimensions

Bentomat roll: width 5m, length 40m, diameter 650mm, tube diameter 110mm.

Core tube: outside diameter 3½" (89mm), length 5.5m (approx.), support plate 660mm diameter.

Lifting beam: 178mm x 102mm x 19kg/m Universal Beam, length 5.5m (approx.).

## 6. Procedure

6.1. **Only specially trained excavator operators are to attach the Bentomat dispenser to the excavator and/or lay Bentomat on the canal banks.** This is due to the risks of getting the Bentomat dispenser stuck on the quick-hitch, damaging or overturning the excavator.

6.2. Before starting check operators manual lifting charts to confirm that the excavator being used has adequate capacity to lift the loaded Bentomat dispenser at the radius required. Weights and radius are given in section 5 above. The excavator must be a 13-15 tonne machine.

6.3. Inserting the core tube into the Bentomat roll

6.3.1. Collect a roll of Bentomat from the storage location and lay it on a flat level surface such as several pallets laid on the car park opposite the fuel store or concrete roadway.

6.3.2. Remove the black plastic bag protecting the Bentomat roll. **Do not remove any banding or strapping that is stopping the roll from unrolling.** If the strapping preventing the Bentomat from unrolling is missing, use lengths of rope or similar to secure the loose end to the roll and prevent it unrolling at this stage.

6.3.3. Check the direction that the roll will naturally unroll. Confirm that this is correct for the bank where the Bentomat is to be laid. If not, the roll must be lifted and turned around and the core tube inserted from the other end. **It is not possible to change this later.**

6.3.4. Trim off any of the plastic tube protruding from either end of the Bentomat roll.

6.3.5. Remove the securing bolt from the top end of the core tube and fit the shaped wooden guidance device too the top end of the core tube.

6.3.6. Using the excavator and a 1 tonne lifting sling choked around the core tube, find the marked balance point of the core tube. Lift the core tube and with one or two people guiding it insert the core tube as far as possible. Reposition the sling to insert the core tube further. Repeat as required. The core tube needs to be as far out of the other end of the Bentomat roll as possible.

6.4. Attaching the lifting beam to the excavator

6.4.1. If the excavator has a quick-hitch override (see appendix B) it is possible and desirable to attach the lifting beam directly to the excavator using 65mm pins. If the excavator does **not** have a quick-hitch override, then it is essential to use the adapter between the lifting beam and the excavator. **If not, it will be extremely difficult to remove the Bentomat dispenser from the excavator.**

6.4.2. If the adapter is being used, first attach it to the excavator in the normal way.

6.4.3. To prevent the lifting beam from falling over to either side whilst being attached it should be supported on a level pile of pallets. Failing that dunny bags (filled with aggregates)

can be used. If the only option is to use volunteers to hold the lifting beam all excavator movements must be done very slowly and with great care.

6.4.4. Position the excavator at the bottom end of the lifting beam (with the bearing) so that the track direction is perpendicular (right-angles) to the lifting beam. This is so fine adjustments can be made to get the excavator exactly square on with the hitch on the lifting beam.

6.4.5. Unlock the quick-hitch (if no adapter is used).

6.4.6. Remove the pins from the lifting beam, carefully insert the excavator quick-hitch or the adapter between the side plates until it is in the correct position to allow the top pin to be inserted and bolted in place.

6.4.7. Manoeuvre the quick-hitch or adapter until the bottom pin is in the correct position to allow the pin to be inserted and bolted in place. If the adapter is used, 60mm pins (rather than 65mm) will make fitting easier.

6.4.8. With the quick-hitch locked, test the attachment for security before further movement with the lifting beam.

6.4.9. **Take great care that the bottom end of the lifting beam does not hit the excavator main boom or cylinder.**

6.5. Attaching the lifting beam to the core tube.

6.5.1. First, ensure that the bottom bearing is secure.

6.5.2. Position the excavator so that the track direction is perpendicular (right-angles) to the core tube/Bentomat roll. This is so you can line it up perfectly. Ensure that once attached the lifting radius (measured from the machine centre pivot to the quick-hitch) is as small as possible.

6.5.3. With the core tube/Bentomat roll horizontal, position the lifting beam above the core tube/Bentomat roll. Manoeuvre the lifting beam to insert the top of the core tube into the top of the lifting beam.

6.5.4. Manoeuvre the lifting beam to insert the bottom of the core tube into the bottom bearing of the lifting beam.

6.5.5. Fit the securing bolt beneath the top plate of the dispenser to prevent the core tube from lifting out of the bottom bearing.

6.6. Lifting the Bentomat roll and positioning it for laying.

6.6.1. Position the excavator such that the lifting radius (measured from the machine centre pivot to the quick-hitch) is as small as possible.

6.6.2. Slowly lift the Bentomat roll.

6.6.3. Once clear of the ground/trailer, carefully bring the roll to the vertical position whilst at the same time reducing the lifting radius to a minimum.

6.6.4. Position the excavator where the Bentomat roll laying is to start. The excavator tracks should be pointing along the canal. Unrolling will be achieved by tracking the excavator.

6.6.5. Slew the Bentomat roll 'over side' with care, keeping the radius as small as possible. Keeping the Bentomat roll as close to the ground as possible move the Bentomat roll into the 45° position about 2 feet (0.5m) above the ground.

## 6.7. Laying the Bentomat

6.7.1. Only now should the strapping/rope securing the roll be removed. Just enough Bentomat should be pulled off the roll to overlap the previous sheet.

6.7.2. The overlap should be treated with Bentonite granules (aka "Fairy Dust") in the normal way.

6.7.3. Two pins should be used to secure the top of the Bentomat above the waterline, and concrete blocks (solid or hollow) piled up on the bottom to secure it whilst it is unrolled.

6.7.4. Slowly track the larger excavator towards Little Tring, making any adjustments necessary to keep the Bentomat in the correct position. Stop after about 3m.

6.7.5. Using gauges and ladders, fit pins every metre. Fit rebar rods in the normal way.

6.7.6. Continue alternating between laying short lengths of Bentomat and fitting rebar rods and pins. Do not try and unroll too much Bentomat at one go – it could sag or start to come off the roll in an uncontrolled manner.

6.7.7. Towards the end of the roll, it will be necessary to 'brake' the Bentomat roll either using a plank of wood or an inbuilt brake.

6.7.8. Once the roll is finished, the plastic tube from the centre of the Bentomat roll must be removed. Dismantling the Bentomat dispenser is the reverse of assembly, although see also section 6.9 and 6.10 below.

6.7.9. If it is not possible to complete laying the whole roll in the day, the Bentomat should be cut vertically to detach the roll. Secure the roll using suitable lengths of rope. Put the Bentomat dispenser down horizontal before attempting to disconnect the excavator. Do not be tempted to try and disconnect the excavator when the Bentomat dispenser is still on the bank – it will be very difficult to disconnect and reconnect.

6.7.10. It is not possible to use a part roll on the opposite bank without completely disassembling the Bentomat dispenser in order to insert the core tube from the opposite end.

6.8. After use return the Bentomat dispenser to its Storage area, and once disconnected (see below) cover with protective sheeting and place the pins in the storage hut. It is easier to separate the lifting beam from the core tube whilst still attached to the excavator.

6.9. Disconnecting the lifting beam when using the adapter.

6.9.1. After putting the lifting beam down unbolt both the 60mm pins between the adapter and the lifting beam and remove them. This will require careful manoeuvring of the excavator to remove the loads on the pins.

6.9.2. Remove the adapter from the quick-hitch in the normal way.

6.10. Disconnecting the lifting beam from the quick-hitch **for machines with a quick-hitch override**.

6.10.1. As the Bentomat dispenser is a large attachment it is not possible to release the quick-hitch in the normal way as attempting to fully crowd the lifting beam would cause it to foul the main boom/cylinder. In JCB terminology the Bentomat dispenser is therefore a "specialised attachment".

- 6.10.2. See Appendix B for JCB operating instructions for operating the quick-hitch override with a “specialised attachment”.
- 6.10.3. Some other excavators have similar override facilities to allow attachments to be removed without curling/crowding the attachment fully in. Consult the relevant machine operating manual for details. Ensure that you confirm that the machine has a quick-hitch override **before** attaching it directly to the Bentomat dispenser **without** using the adapter.

Appendix A – Pictures



Bentomat dispenser. Note quick-hitch adapter plate and securing bolt under top bracket (on left).



Bentomat dispenser in laying position.



Inserting pins.

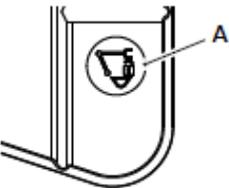
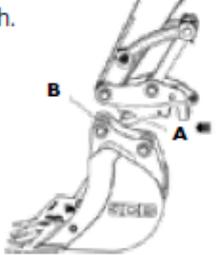


40m Bentomat roll laid. Steel rods & hammering pins home still to be completed.

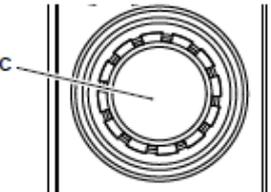
## Appendix B – JCB 131X Quick-Hitch Operation

When using the Bentomat dispenser, substitute sections 4a & 4b for section 4.

### Standard attachments

<p><b>1 Start unlock process</b></p> <p>To start quick hitch unlock process ensure hydraulics are live then press quick hitch sequence button (A).</p> 	<p><b>2 Confirm process</b></p> <p>Switch (B) will flash and the buzzer will sound constantly for 5 seconds indicating confirmation is required. Press quickhitch confirm button (B). If not pressed within 5 seconds the process will need to be restarted.</p> 	<p><b>3 Indicator</b></p> <p>When the sequence is confirmed the confirmation button will flash and a bucket crowd symbol will show on the display (B).</p>
<p><b>4 Remove attachment</b></p> <p>To disengage the quickhitch jaws, crowd the attachment for 3 seconds. The attachment can now be removed.</p> 	<p><b>5 Change attachment</b></p> <p>Operate the machine to engage the jaw (D) with the attachment (E) and then full crowd the attachment to align latch.</p> 	<p><b>6 Lock quickhitch</b></p> <p>To engage the lock on the quickhitch press the following button (B) and visually check hitch is locked.</p> 

### Specialised attachments

<p><b>4a Crowd override</b></p> <p>For large attachments where bucket crowding is not possible follow steps 1 to 3, and then hold rotary dial (C) for 10 seconds.</p> 	<p><b>4b Remove attachment</b></p> <p>An audible buzzer will sound after 10 seconds to indicate that the jaws of the quickhitch are open. The attachment can now be removed.</p>	<p>Specialised attachments are any attachment that when crowded fully could foul the boom/dipper.</p>
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