PLCS

6” MIDI PIPE HANDLER OPERATORS MANUAL

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INTRODUCTION

Inserting PE pipe into old cast iron mains can now be carried out safer, simpler and faster with the use of Steve Vick International’s new 6” Midi Pipe Handler.

The Midi Pipe Handler can be used on Live Mains and Dead Mains Insertion.

Attached to the quick hitch or bucket pins of an excavator, The Midi Pipe Handler is capable of gripping the PE, positioning it in the excavation and inserting the pipe. The entire operation is controlled from the cab avoiding the need for operators to handle the pipe.

The model supplements the smaller 4” Mini Pipe Handler, but is for use with a typical 2 or 3 tonne class hydraulic excavator (mini digger) for inserting 6”PE pipe.

OVERVIEW

The 6” Midi Pipe Handler is the larger of the Steve Vick International Pipe Handlers for coiled pipe. The gripping mechansim is different on this model, as the clamping action is sideways on which counteracts the usual ovality that is experienced on 6” PE.

The 6” Midi Pipe Handler requires dual flow off the mini digger to allow the two rams to apply a firm grip on 6” PE where as the smaller model is single ram with a spring loaded return mechanism. Therefore 6” Midi Pipe Handler can only be used on dual flow machines whereas the smaller version can be used on single and dual flow.

PUSHING CAPACITIES

Pushing forces experienced onsite will vary depending on the make and model of excavator being used. The pushing force is related to the arm tear-out force which is the maximum force achievable from the excavator where the pipe is inserted by pulling the pipe towards the excavator rather than away. It is still possible to push pipe in by pushing away from the excavator however pushing forces will be smaller.

OVERVIEW (CONT.)

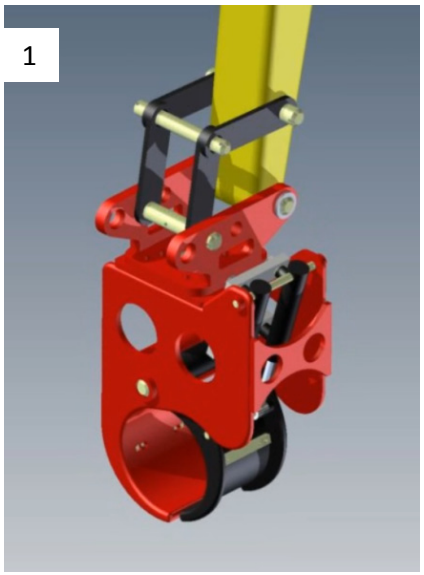
The Midi Pipe Handler works by gripping the pipe in its jaws and pushing it forward using the hydraulic power of the excavator’s arm or boom. It is also able to pick up pipe and position it in the excavation ready for insertion.

Image 1 shows the empty Pipe Handler in the closed position and **Image 2** has the side jaw open ready to receive the PE.

Image 3 shows PE pipe resting on the static bottom/side jaw. This will also be the position when retracting the Pipe Handler up along the PE before starting a new stroke.

Image 4 shows the moving side clamp pressed against the PE gripping it for insertion.

1



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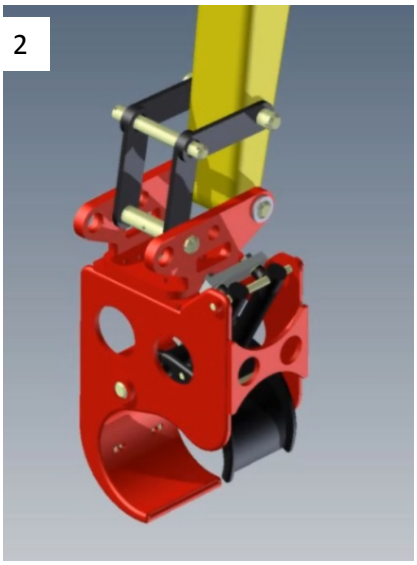

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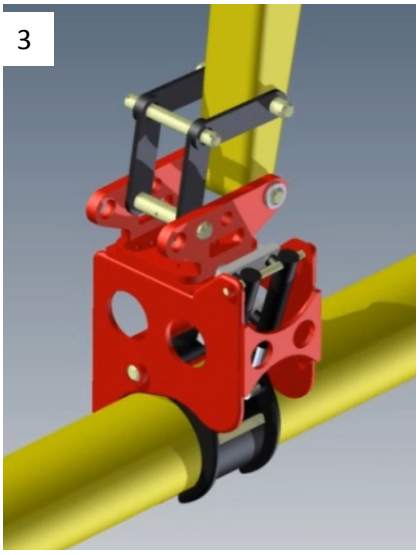

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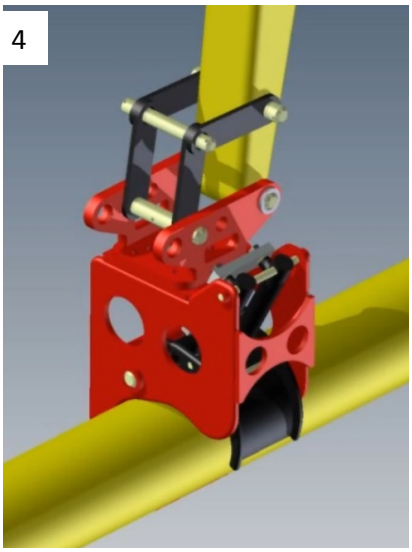
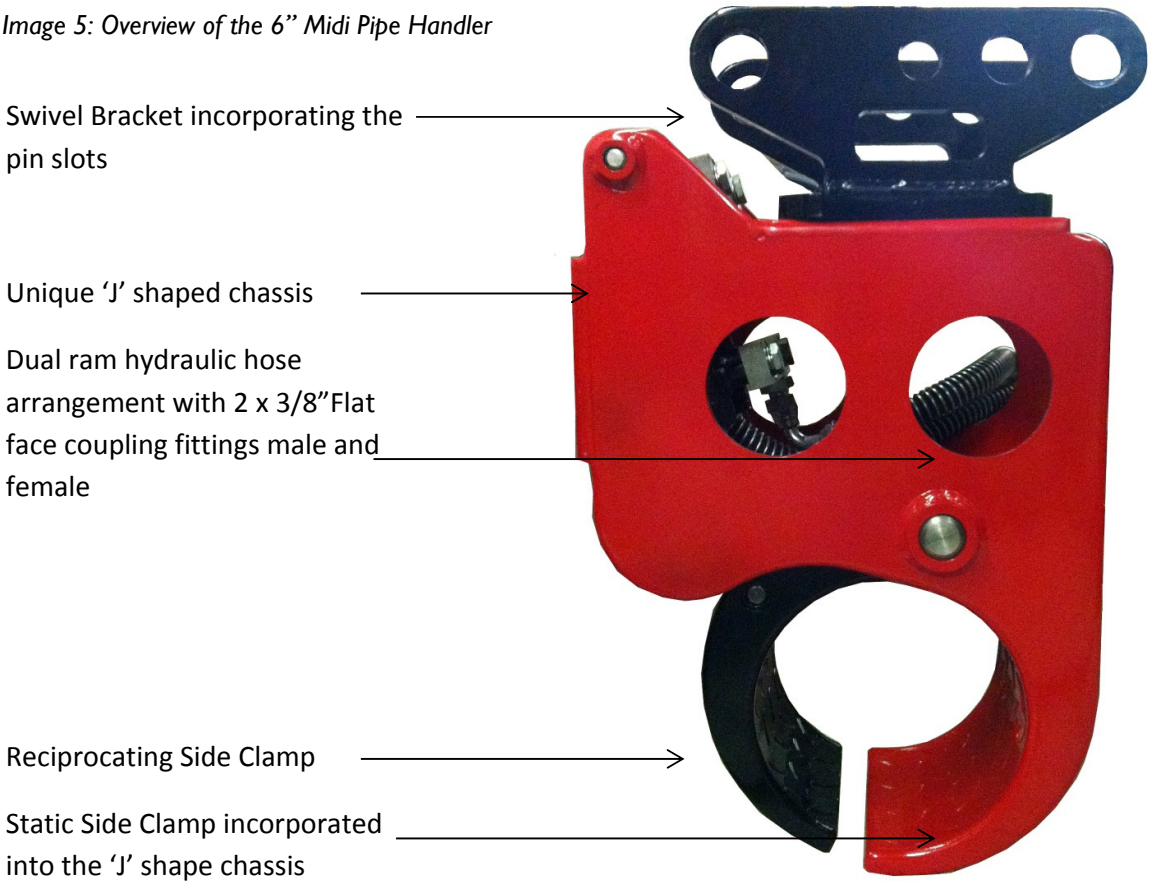


MAJOR FEATURES

- For 6" PE Pipe and below – Can be shelled down for use with smaller diameter pipes.
- Midi Pipe Handler connects to arm of 1½, 2 and 3 tonne excavators using a multi-pin swivel bracket using a choice of pin locations and sizes to accommodate most excavators. However it is not recommended for 1 ½ tonne machines when inserting 6" PE pipe.
- Midi Pipe Handler powered from the third service off take/breaker line hydraulic power source located on excavator's arm/boom.
- Designed for dual flow excavators using powerful double ram for superior gripping force.
- Extremely short preparation time – Midi Pipe Handler connects very quickly to dual flow excavators using the two hydraulic hoses supplied. The hydraulic feed is **3/8"** using flat faced couplings male and female.
- Supplied 3/8" to 3/4" back to back couplers to allow connection onto mini diggers with 3/4" fittings
- Pushes at speeds up to 33 feet per minute.
- Lengths in excess of 650 feet can be pushed at any one time.
- The Midi Pipe Handler does not require any anchoring – soft ground conditions no longer an issue and anchoring pins are not needed.
- Can push or pull pipe and load or un-load from storage racks or a delivery lorry.
- Reversing the operation is simple – simply push the pipe 'away' from the excavator.
- Simple to use – similar driving technique to 'grading'.
- Very robust construction - designed for use in the pipe laying environment.
- Simple maintenance required only.
- No need to tow alternative pushing equipment to site, the Midi Pipe Handler can be connected to the mini excavator and securely ratchet strapped to mini excavator trailer during transport or located within operatives van (see weight next page).
- Can help 'anchor pipe' next to butt-fusing machines or help manoeuvre into place

MAJOR FEATURES AND SPECIFICATIONS

Image 5: Overview of the 6" Midi Pipe Handler



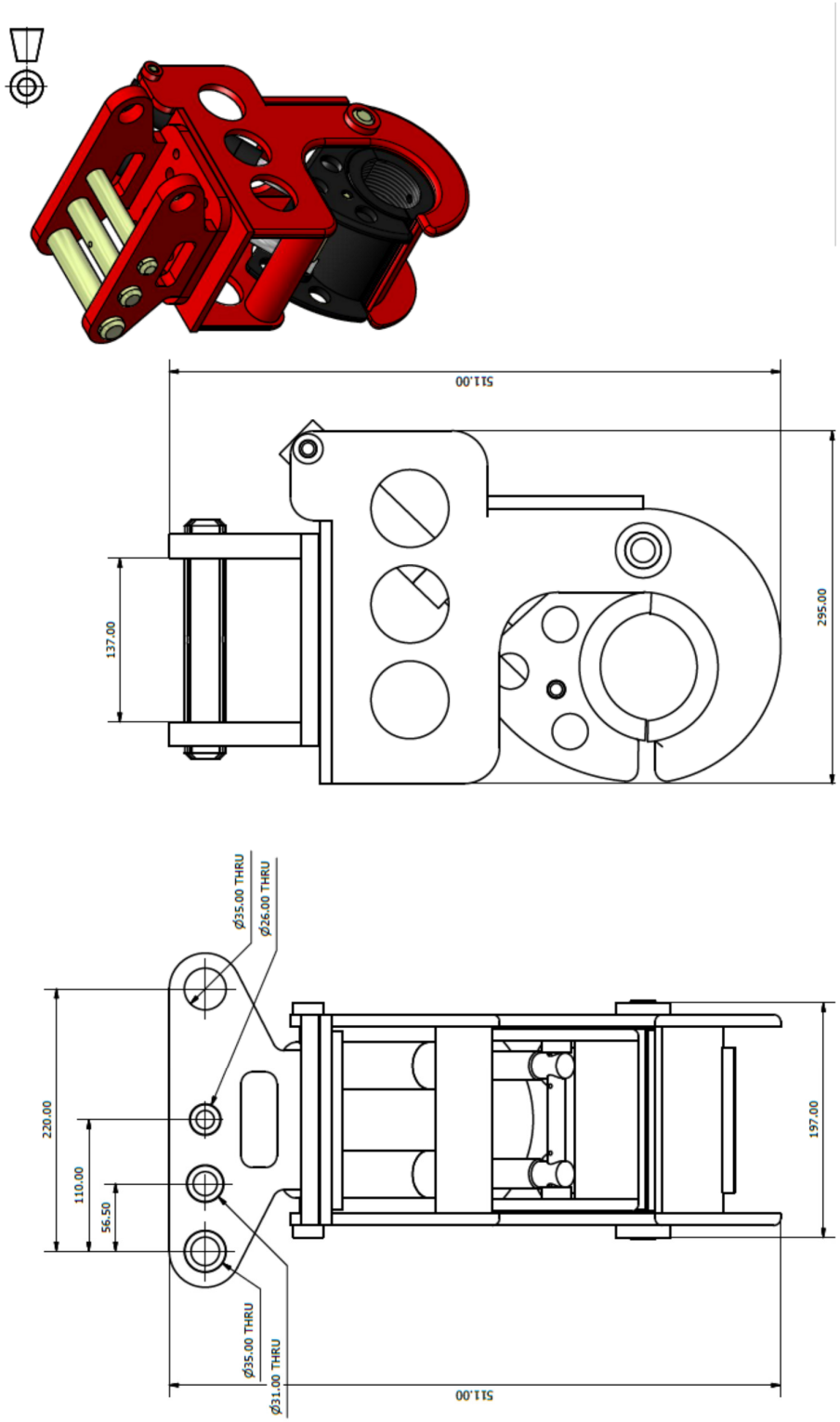
BASIC DIMENSIONS AND WEIGHTS (see page 6 for overall dimensions)

MODEL	LENGTH (mm)	WIDTH (mm)	HEIGHT (mm)	WEIGHT (kg)
6" Version	81	61	54	80

Model	Pin size (mm)	Length between centre of pins (mm)	Width between pins (mm)
6" Version	25.4	110	137
	30	163.5	137
	34	220	137

KEY DIMENSIONAL SCHEMATIC DRAWING/S

Diagram 1 - Basic Dimensions



FITTING THE 6" MIDI PIPE HANDLER TO AN EXCAVATOR

The operative must be fully briefed on how to attach the Midi Pipe Handler to an excavator. There are different excavators being used on site however the Midi Pipe Handler is designed to fit to most excavators known commonly as 'mini diggers'. **However when inserting 6" PE pipe, it is strongly recommended that a 3 tonne excavator is used due to the stiffness and weight of 6" coiled pipe.** The top bracket will take the pin arrangement for 1½, 2 and 3 tonne models and this training is required to show which pin slots is used depending on the excavator

Image 6: Cross section of the swivel bracket and the arrangement of pin slots.

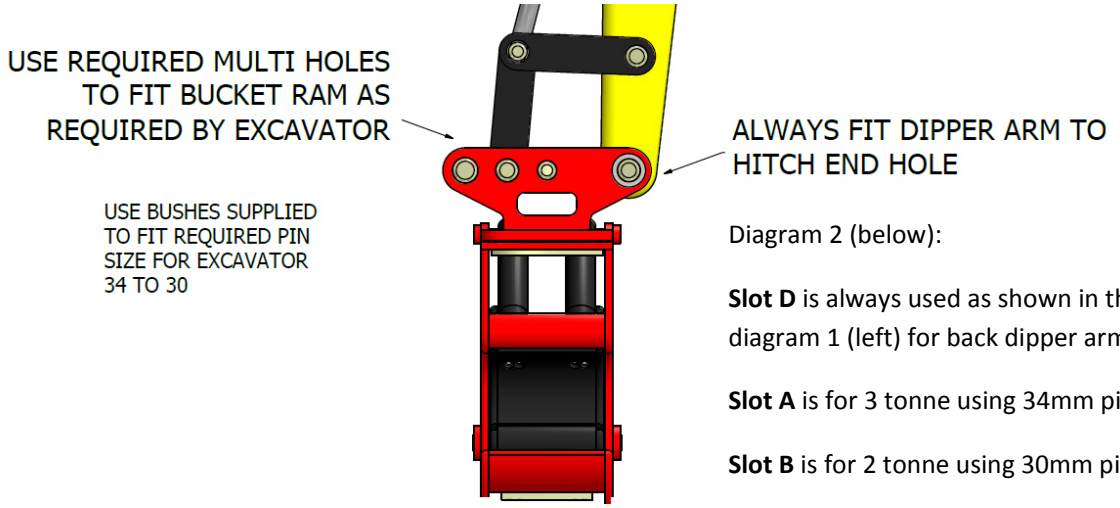


Diagram 2 (below):

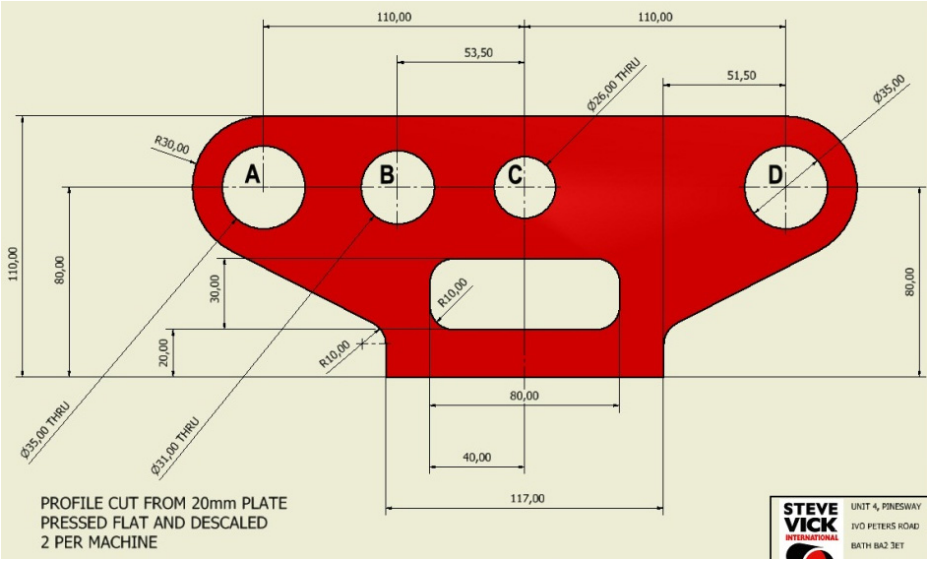
Slot D is always used as shown in the diagram 1 (left) for back dipper arm

Slot A is for 3 tonne using 34mm pins

Slot B is for 2 tonne using 30mm pins

Slot C for 1.5 tonnes using 25mm pins - **NOT SUPPLIED**

Diagram 2: Swivel Bracket dimensions.



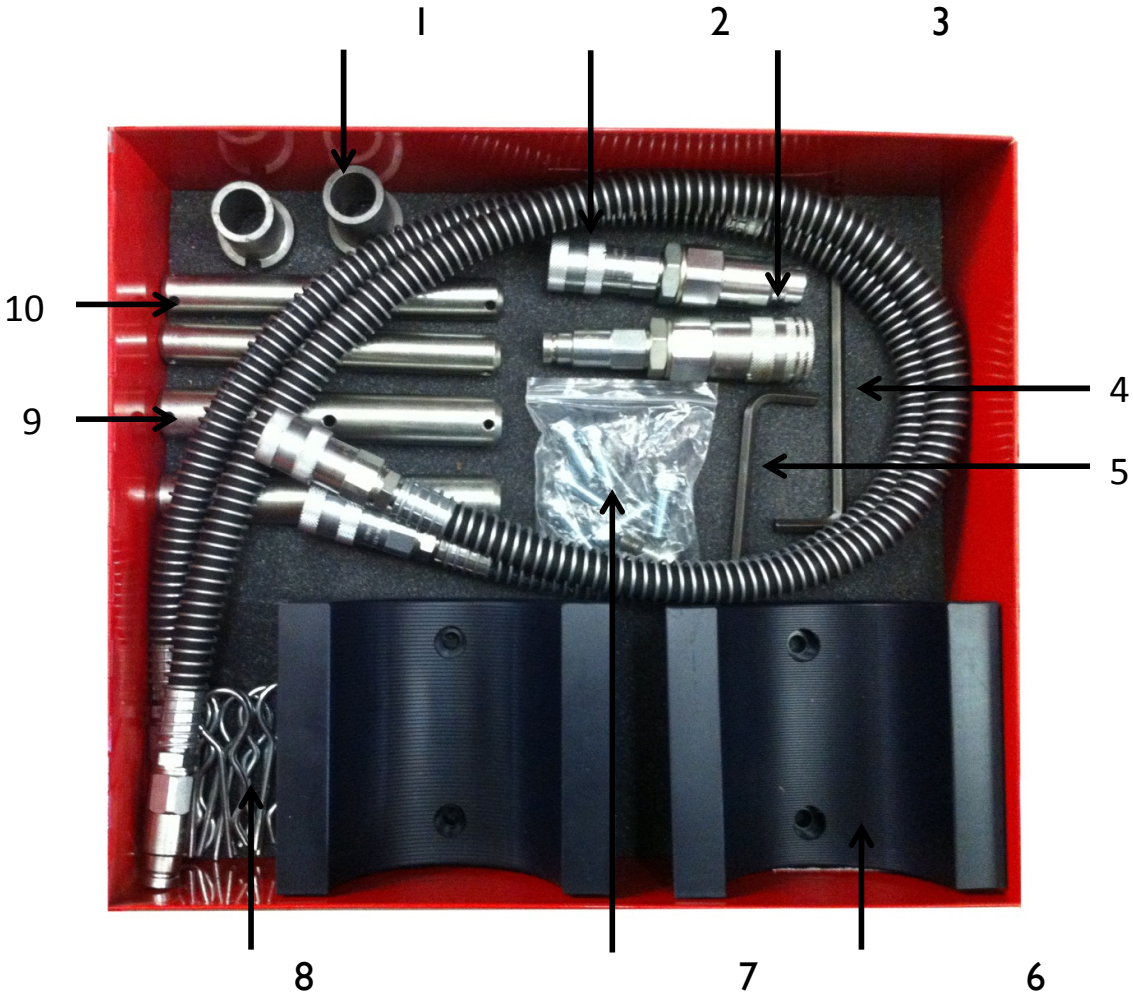
HOSE ARRANGEMENT

The hose arrangement on the dual flow 6” Midi Pipe Handler will fit the typical hose arrangement found on most excavators. These two hoses have 3/8” flat face couplers male and female, and would fit to the opposite fittings found on the excavator. Most mini excavators will be dual flow but may need to be manually switched over from single to dual flow on the excavator.

Image 7 below shows a typical information panel on a mini digger that explains where and how to turn the flow from single feed (to use with a pecker for example) to dual flow for equipment that needs a reciprocating dual flow movement of oil. This must be confirmed on the mini digger prior to using the 6” midi pipe handler.

6” MIDI PIPE HANDLER KIT CONTENTS

Image 8 below shows the kit box supplied with purchases and hires from Steve Vick International



No.	Item	Quantity
1	Extended Bushes from 34mm to 30mm Pins	2
2	Hydraulic Hose Extensions with 3/8” female coupling	2
3	Flat Face Adaptors 3/8” to 3/4” male and female	2
4	Long 8mm ball end *Allan* Key	1
5	Short 8mm *Allan* Key	1
6	6” to 4” Shells/Shims	2
7	Shell Bolts cap-head socket 10mm x 30mm	4
8	R-Pins (5mm)	8
9	34mm Excavator Pins 200mm (3 tonne)	2
10	30mm Excavator Pins 200mm (2 tonne)	2
	Operators Manual *(Not shown)*	1

SITE PREPARATION

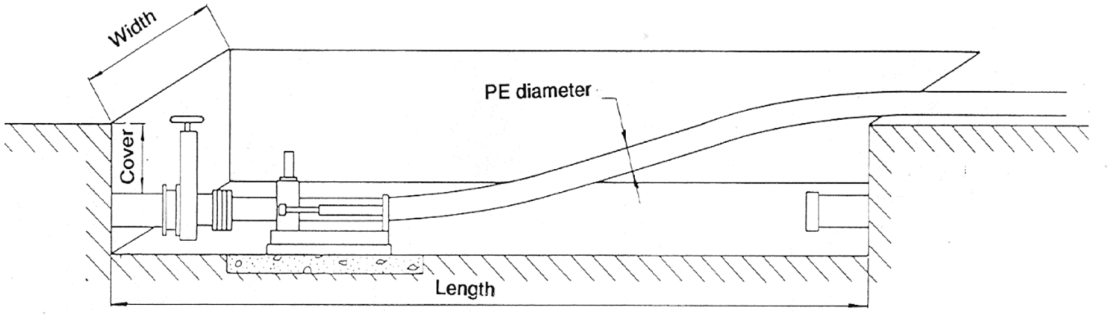
All excavation work shall be carried out in accordance with T/PR/SW/1 – Work Procedure for Excavations or equivalent, and all other related codes of practise.

1. Ensure the appropriate PPE is worn: Overall, Glasses, Hard Hat, Protective Footwear and Gloves, Hi-Viz jacket
2. Ensure there is a designated banksman to control all operations of the excavator
3. Ensure the Midi Pipe Handler attachment and detachment to and from the excavator is taking place within the cordoned off area
4. Ensure all the PE pipe handling, manoeuvring and mains insertion via the excavator is taking place within the cordoned off area
5. Ensure the movement of the excavator arm is contained within the cordoned off area
6. The driver shall operate the excavator and Mini Pipe Handler from the cab at all times
7. Check that the Safe Working Load of the excavator shall not be exceeded by the combined weight of the Midi Pipe Handler and PE pipe stick or string.
8. Check there are no overhead lines in close proximity to the lifting position.
9. Check that all of the fittings and attachments required to ensure that the Midi Pipe Handler can be correctly attached to the excavator arm and its hydraulic system are available.

SITE DIMENSIONS

The following diagram and table shows suggested excavation lengths which are taken from industry standard Main Laying Manual.

SIZE OF EXCAVATION REQUIRED				
PE Diameter	Minimum total length			Width
	Up to 3' of cover	1m. to 6' of cover	6' to 9' of cover	
6"	20'	24'	28'	32"



Note, to use the Midi Pipe Handler requires no increase in the size of trench normally excavated. Where the trench needs shoring or shuttering (where a risk assessment has deemed it necessary due to depth, unstable ground etc.) ensure no support props hinder the movement of the excavator arm. If this is unavoidable, relocate the excavator to a location where the pipe can still be safely inserted.

FITTING THE 6" MIDI PIPE HANDLER TO AN EXCAVATOR

There are different excavators being used on site however the Midi Pipe Handler is designed to fit to most excavators known commonly as 'mini diggers'.

Fitting the Mini Pipe Handler to Excavator using Bucket Pins

1. Ensure all the correct fittings are available to allow connection onto the excavator.
2. Unload the Midi Pipe Handler onto horizontal ground within the cordoned off area (two man operation)
3. Position the Midi Pipe Handler so that the top bracket is upright (two man operation).
4. Rotate the swivel mount to align with the excavator arm.
5. Position the excavator so that the arm can be lowered on to the Midi Pipe Handler.
6. With the excavator arm aligned with the pins slots slide the pins fully through the swivel bracket and secure on the other side using R-Pins as described on page 7.
7. Connect the hoses into the correct flat face couplings (3/8") and secure the knurled swivel *(see Images 9 and 10 and 11on page 12). Adaptors supplied may be necessary.*
8. Ensure no hoses are restricting the movement of the Midi Pipe Handler.

Fitting the Mini Pipe Handler to Excavator using a Pin System Quick Hitch

1. Ensure all the correct fittings are available to allow connection onto the excavator.
2. Ensure all safety devices, pins, locks etc. are available, fitted and checked by the machine operator before using the Mini Pipe Handler.
3. Unload the Midi Pipe Handler onto horizontal ground within the cordoned off area (two man operation)
4. Position the Midi Pipe Handler so that the top bracket is upright (two man operation).
5. Rotate the swivel mount to align with the excavator arm.
6. **Engage** the quick hitch with the open pivot (front or rear depending on type of quick hitch being used) with the relevant pin on the swivel bracket.
7. **Retain** the Midi Pipe Handler to the quick hitch by locking the remaining pivot (automatic, semi-automatic or manual depending on type of quick hitch being used) with the remaining pin on the swivel bracket.
8. **Secure** the Midi Pipe Handler to the quick hitch by inserting the safety pin.
9. Connect the hoses into the correct flat face couplings (3/8") and secure the knurled swivel *(see Images 9 and 10 and 11 on page 12). Adaptors supplied may be necessary.*
10. Ensure no hoses are restricting the movement of the Midi Pipe Handler.

Image 9 and 10: Mini Pipe Handler connected to an excavator using bucket pins on the left and a quick hitch on the right

Image 11: Typical connections found on mini excavators. The hose lines from the Midi Pipe Handler will connect to the opposite fitting on the excavator, i.e. the Midi Pipe Handler leaves Steve Vick International with a 3/8” male and female flat face couplers and will connect to the male and female equivalents on the mini excavator. If ¾” the back to back adaptors supplied will be required.

OPERATING THE 6” MIDI PIPE HANDLER

It is imperative the operator is aware of how to grip and insert the pipe into the carrier main. Whether on Dead Mains Insertion or Live Mains Insertion the process is the same. The key points to make during the training is that the pipe is not to be pulled up or pushed down onto while inserting the pipe and that the Mini Pipe Handler is kept perpendicular to the main so that no ‘pinching’ occurs. In effect, the Mini Pipe Handler is generally kept flat with the pipe in what is referred to as a ‘grading operation’. *See Images 6 and 7 on page 10.*

This will all become evident when the operator begins the insertion. On Dead mains Insertion it is best practise to use a mains insertion trumpet to prevent scouring of the PE.

The 6” Midi Pipe Handler will work on dual feed excavators and the gripping force is operated from within the cabin and using the 3rd service pedal. With the mini digger in dual flow mode both sides of the pedal are depressed to open and close the jaw. The Midi Pipe Handler is fitted with a flow control valve on the hose line. This allows the clamping speed to be controlled to prevent damage to the PE. *See Image 12 opposite.*

The side opening design means the Midi Pipe Handler can be located around the PE without the help from an operative whether on top or in trench.

OPERATING THE 6" MID PIPE HANDLER

1. Ensure side jaw of MPH is in the open position
2. Locate the MPH around the PE via the open side
3. Ensure the safest point is chosen but maximises the length of stroke
4. Operate the foot pedal to close the top jaw onto the PE pipe *(see images 15 and 16 on page 16)*
5. Ensure the MPH is at right angles to the PE *(see Images 13 and on page 14 and 15)*
6. Operate the controls on the excavator to bring the PE into the host main using technique described above
7. Once the PE has been pushed in, release the foot pedal and press down on opposite pedal to open the top jaw
8. If the top jaw is slow to open or does not open at all open fully the flow control valve on the hose line *(see page 13)*
9. Slide the MPH back up along the PE and repeat process above and at all times maintain a controlled, level and safe position of the MPH to ensure no damage to the PE
10. At all times maintain SAFE DIGGING PRACTISES when using the MPH to avoid stressing the excavator arm and potential PE damage

Image 13: Correct alignment of Midi Pipe Handler around the PE pipe. Image also shows a 'sensible' location for the Mini Pipe Handler ensuring the mini excavator is not over stretching.

OPERATING THE 6" MID PIPE HANDLER (CONTINUED)

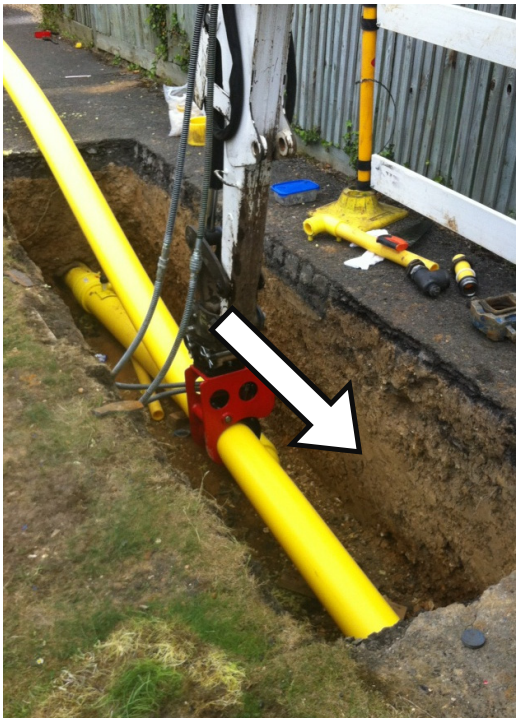


Image 14: Short steady stroke maintaining the correct alignment ensuring there is no twisting, pulling or pushing down on the PE pipe.

Image 15: Typical foot pedals found in a mini excavator. Usually the pedal arrangement on the left foot as you occupy the cabin will operate the 3rd service (breaker line). ***It may be necessary to adjust the feed screws underneath the pedals to allow the hydraulic oil line to flow.***

Image 16: Operating the foot pedal in the cabin of the mini excavator.

CHANGING THE SHELLS

To allow the pipe to be gripped correctly, the correct shells must be fitted. The shells are secured using a total of four M10 bolts and use the equivalent Allen Key tool.

1. Once the MPH is fully attached to the arm of the excavator lift it up off the ground to a safe working height
2. Shells can now be changed by using an Allen Key designed to fit an M10 bolt
3. Ensure new shells are fully hand tightened

GENERAL SERVICE AND MAINTENANCE

The 6" Midi Pipe Handler has been designed to be relatively free of maintenance, simple checks on the tightness of bolts, any hydraulic leaks and general wear on parts being all that is required in a normal day to day operation.

1. Clean down the machine and check all moving parts for wear and tear
2. Check all hydraulic joints and couplers for leaks
3. Check all hoses remain in good condition
4. Ensure the flow control feed is operational
5. Ensure the swivel bracket rotates and is not clogged up with grease and debris
6. Retighten all nuts and bolts paying particular attention to the swivel bracket. Bolts used on the swivel bracket are **M12 and require a torque setting of 100 (ft. /lbs.)**
7. Ensure the shells are fully secured without any part of the cap head showing through which may score the PE