

**STEVE  
VICK**  
INTERNATIONAL



INNOVATIVE ENGINEERING FOR TRENCHLESS  
RENOVATION AND DECOMMISSIONING OF  
PIPES WORLDWIDE

 **PLCS**

UNIQUE PRODUCTS FOR THE GAS DISTRIBUTION ENGINEER

Sole North American Distributor for Steve Vick International

102 Gaither Drive, Unit 1  
Mount Laurel, NJ 08054

(856) 722-1333

[www.plcsusa.com](http://www.plcsusa.com)



## **Mini 125 (2"-4") Pipe Handler**

### **Operators Manual**

---

**PLCS**

**Sole North American Distributor of Steve Vick International Products**

102 Gaither Drive, Unit 1, Mount Laurel, NJ 08054

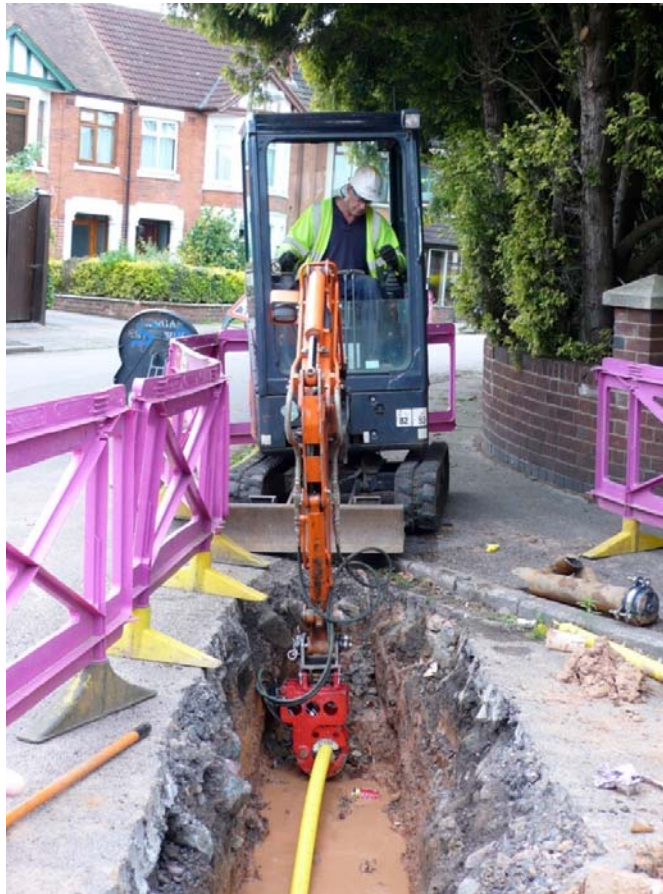
Phone: (856) 722-1333 • fax: (856) 273-9723 • e-mail: [info@plcsusa.com](mailto:info@plcsusa.com) • web: [www.plcsusa.com](http://www.plcsusa.com)

## MINI PIPE HANDLER OPERATORS MANUAL

### 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 Mini Pipe Handler.

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



Attached to the quick hitch or bucket pins of an excavator, The Mini 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.

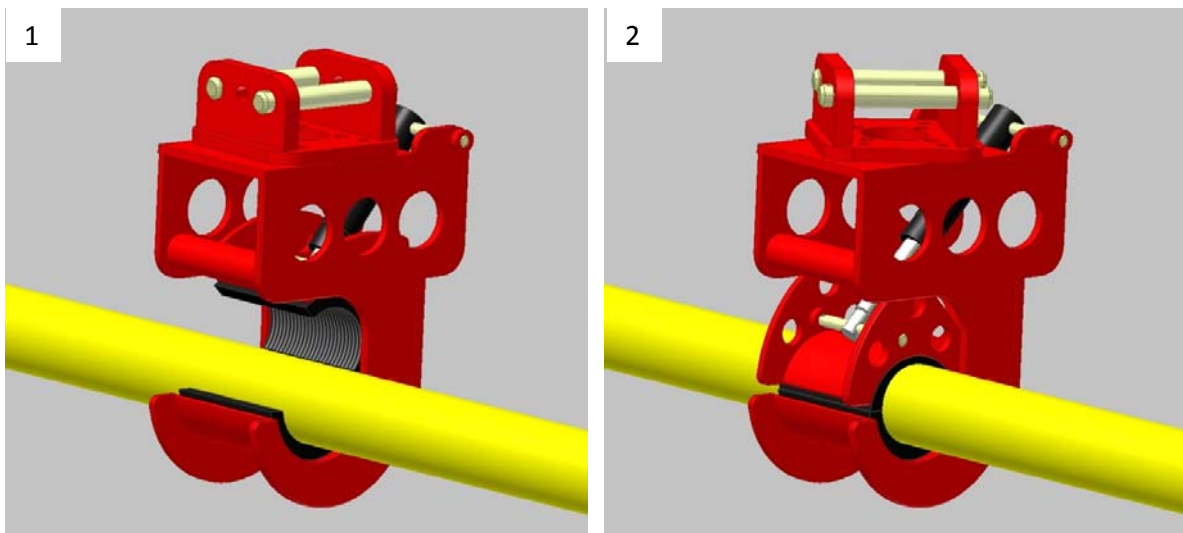
This model handles pipe diameters up to 125mm (4"), for use with a 1.5, 2 or 3 tonne class hydraulic excavator. A larger model for 180 (6") PE is also available and is recommended for use on a 3 tonne excavator due to the weight and stiffness of 180 (6") coiled pipe.

Shell inserts are available to reduce the diameter of the gripping jaws to fit all sizes 2" and 3".

## OVERVIEW

The Mini 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 PE pipe resting on the static bottom jaw. The top jaw is retracted (open) allowing the PE to be located within the jaws which can be done without the need for any operative to come near the jaw. The jaw is also open when sliding back up along the PE ready for another insertion stroke. By following the line of the PE in this way there is less chance of 'pinching' the PE pipe.



**Image 2** shows the top jaw in the closed position gripping the PE. The arrangement of the hydraulic clamping ram is such that it optimises the force needed to powerfully grip the PE without damaging it meaning pushing distances can be increased as it is less likely to slip along the PE.

Note, the images above show the original swivel bracket which has now been replaced with a multi-pin swivel bracket as shown on pages 3, 5 and 6.

### 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.

## MAJOR FEATURES CONTINUED

For 125 (4") PE Pipe and below – Can be shelled down for use with smaller diameter pipes.

A scaled up version will be available using a 3 tonne excavator when inserting 180 (6") PE for safety reasons due to the increase in size, weight and unyielding nature of 180 (6") pipe.

Mini 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.

Extremely short preparation time – Mini Pipe Handler connects very quickly to excavators using a single hose connection.

Mini Pipe Handler powered from the third service off take/breaker line hydraulic power source located on excavator's arm/boom.

Can be used on single or dual flow excavators using a powerful spring mechanism to return the oil flow.

The hydraulic feed is **3/8"** using flat faced couplings. This will fit most excavators however adaptors may be needed if fittings are different on the excavator

Pushes at speeds up to 10 metres (33 ft.) per minute.

Lengths in excess of 200 metres (656 ft.) can be pushed at any one time.

The Mini 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 trucks.

Simple to use – similar driving technique to 'grading'.

Very robust construction - designed for use in the pipe laying environment.

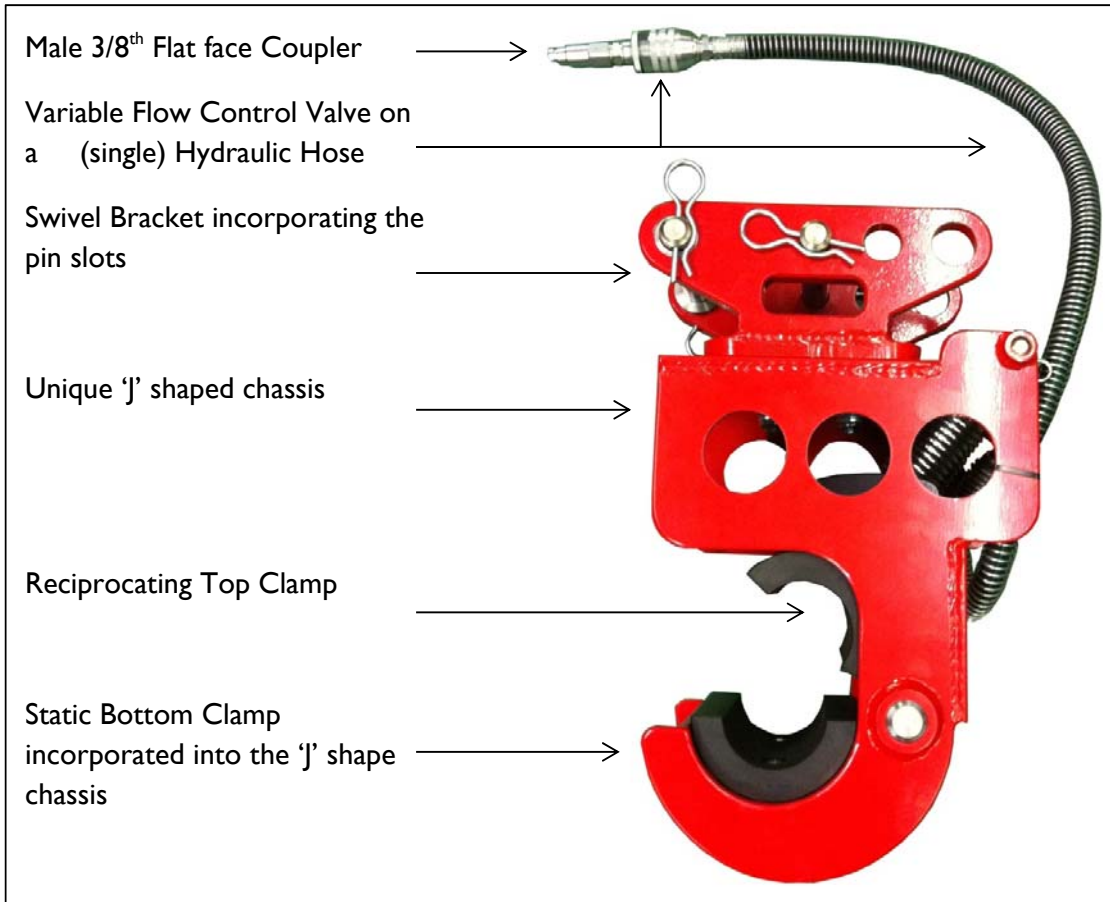
Simple maintenance required only.

No need to tow alternative pushing equipment to site, the Mini Pipe Handler can be connected to the mini excavator and securely ratchet strapped to mini excavator trailer during transport or located within truck (see weight next page).

Can help 'anchor pipe' next to butt-fusing machines to help line up with addition coils/sticks. (See page 16)

**MAJOR FEATURES AND SPECIFICATIONS**

Image 3: Overview of the Mini Pipe Handler



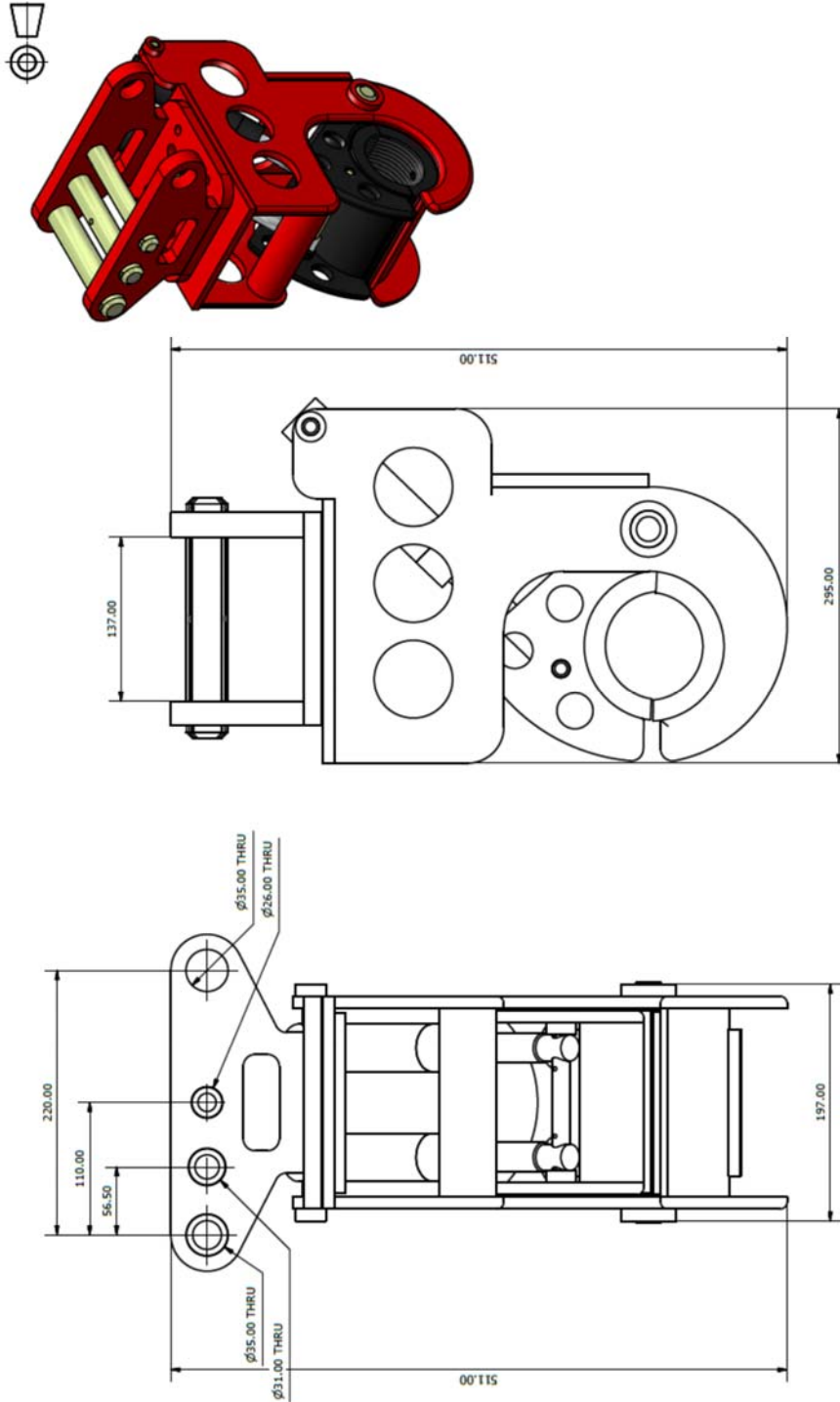
**BASIC DIMENSIONS AND WEIGHTS**  
(see page 5 for overall dimensions)

| MODEL         | LENGTH | WIDTH | HEIGHT | WEIGHT  |
|---------------|--------|-------|--------|---------|
| 2"-4" Version | 11.61" | 7.75" | 20"    | 80 lbs. |

| Model         | Pin size | Length between center of pins | Width between pins |
|---------------|----------|-------------------------------|--------------------|
| 2"-4" Version | 1"       | 4.33"                         | 5.39"              |
|               | 1 3/16"  | 6.44"                         | 5.39"              |
|               | 1 3/8"   | 8.66"                         | 5.39"              |

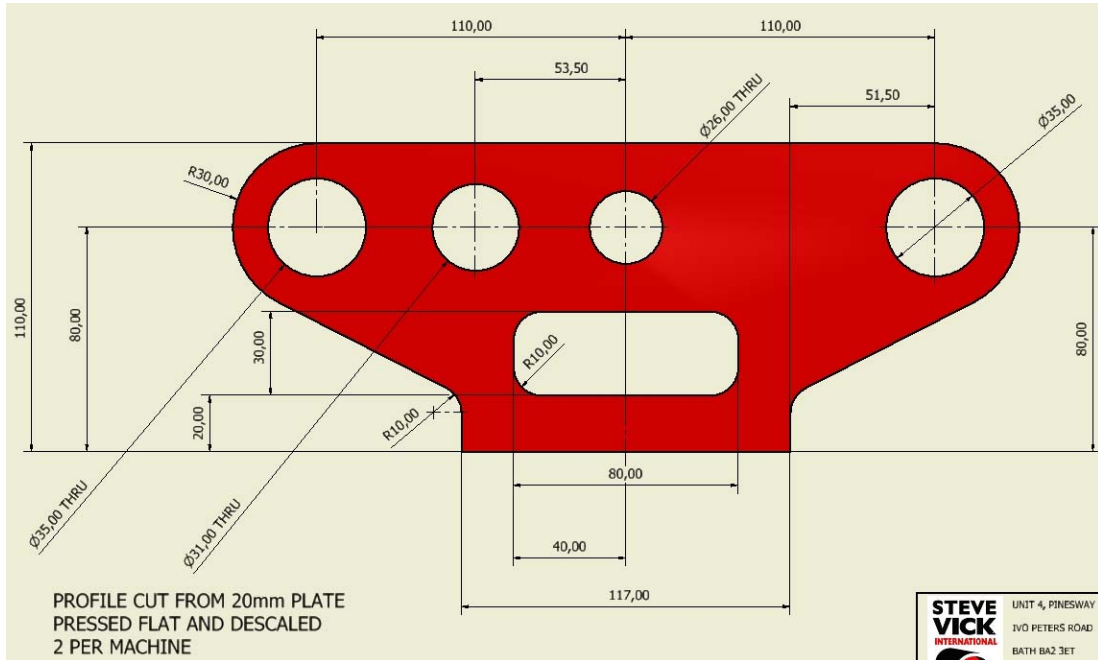
KEY DIMENSIONAL SCHEMATIC DRAWING/S

Basic Dimensions



## KEY DIMENSIONAL SCHEMATIC DRAWING/S (continued)

Dimensions of the Swivel Bracket and pin slots and sizes to help confirm correct mini excavator/quick hitch.



## REMOVING MINI PIPE HANDLER FROM STORAGE BOX

This is how the Mini Pipe Handler will look when delivered using the storage box.

The lid will indicate the total weight of 68kg (150 lbs) and a two man lift.

Inside the metal container will sit:

- The Mini Pipe Handler
- Extension Hose
- Pins for different size excavators and R-Pins
- Range of shells (if requested on hire or purchase)
- Allan Key
- Shell bolts (if requested with extra shells on hire or purchase)
- Instruction Manual



The Mini Pipe Handler can be safely removed from the storage box one of two ways and are shown in the following two pages. The images are side profiles showing the Mini Pipe Handler within the storage box.



## REMOVING MINI PIPE HANDLER FROM STORAGE BOX

### Lifting Mini Pipe Handler manually

The image below shows the Mini Pipe Handler lying flat with the open side of the 'J' clamp facing the base panel of the storage box. It is recommended the Mini Pipe Handler is removed from the storage box only when the excavator is ready to connect up to avoid any unnecessary damage or storage issues.

- When first opening the lid, move aside the hydraulic hose so that you can see the lifting points which are shown by the arrows.
- These lifting points are the back plate and the bucket pins (it may be necessary to rotate the swivel bracket to grip the outer most pin).
- Ensure gloves are worn as part of standard PPE.
- This is a TWO MAN operation due to the weight of the Mini Pipe Handler.
- When a firm grip has been established, lift upwards and out the Mini Pipe Handler away from the storage box and locate in a convenient place ready for immediate connection to the excavator.

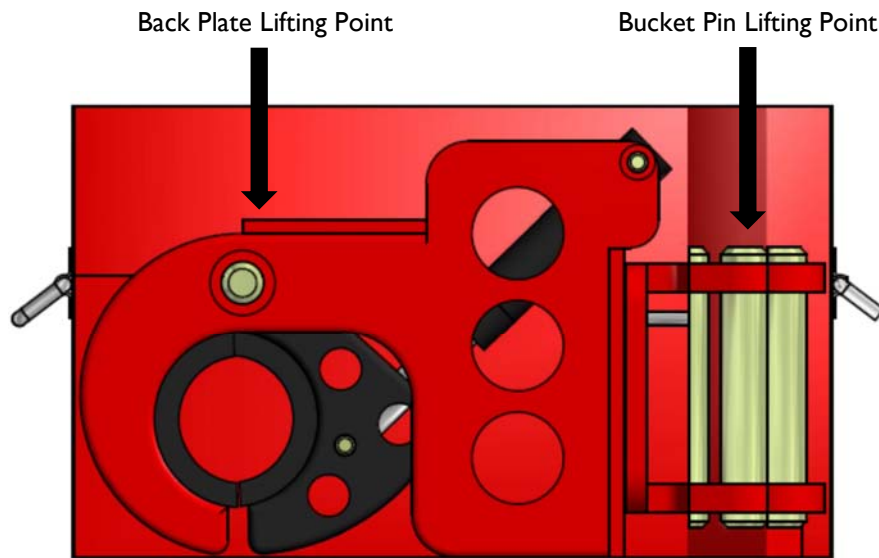


Image 4, side view of storage box with Mini Pipe Handler inside

## REMOVING MINI PIPE HANDLER FROM STORAGE BOX (continued)

Alternative option to lifting out the Mini Pipe Handler manually:

### Rotating the Mini Pipe Handler ready for direct connection to the excavator

The image below shows the Mini Pipe Handler rotated from the position show in the previous page and lying on its base and leaning against the side panel of the storage box. It is recommended the Mini Pipe Handler is positioned like this only when the excavator is ready to connect up to avoid any unnecessary damage or storage issues.

- Locate storage box containing the Mini Pipe Handler where the excavator locate its arm/boom over the top of the lid. (This is a TWO MAN operation due to the weight).
- When first opening the lid, move aside the hydraulic hose so that you can see the lifting/rotation point which is shown by the arrow.
- This lifting/rotation point is the bucket pins (it may be necessary to rotate the swivel bracket to grip the outer most pin).
- Ensure gloves are worn as part of standard PPE.
- Rotate the Mini Pipe Handler on its curved base into the upright position and lean against the side panel.
- This can be carried out as a SINGLE MAN operation because the Mini Pipe Handler is only rotated into the upright position.
- Lower the arm/boom of the excavator and connect to the Mini Pipe Handler as described on page 10.

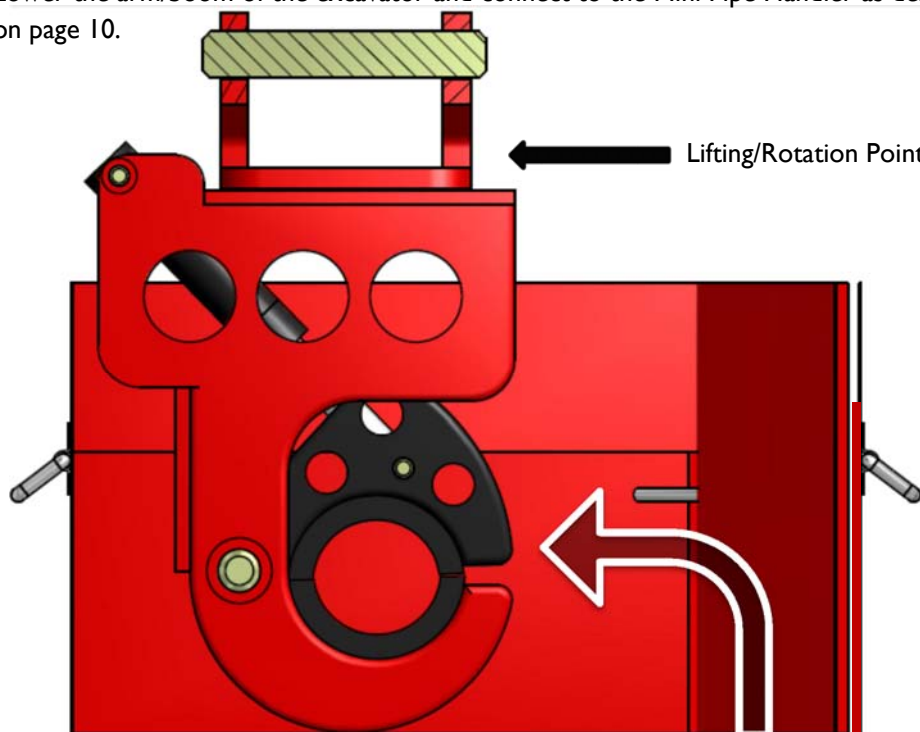


Image 4, side view of storage box with Mini Pipe Handler inside rotated upright.

## SITE PREPARATION

All excavation work shall be carried out in accordance with company procedures –

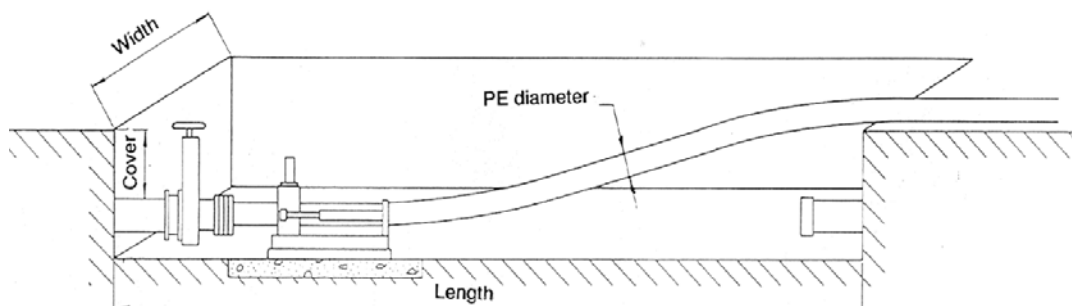
1. Excavations or equivalent, and all other related codes of practice.
2. Ensure the appropriate PPE is worn: Overall, Glasses, Hard Hat, Protective Footwear and Gloves, Hi-Viz jacket
3. Ensure there is a designated banksman to control all operations of the excavator
4. Ensure the Mini Pipe Handler attachment and detachment to and from the excavator is taking place within the cordoned off area
5. Ensure all the PE pipe handling, manoeuvring and mains insertion via the excavator is taking place within the cordoned off area
6. Ensure the movement of the excavator arm is contained within the cordoned off area
7. The driver shall operate the excavator and Mini Pipe Handler from the cab at all times
8. Check that the Safe Working Load of the excavator shall not be exceeded by the combined weight of the Mini Pipe Handler and PE pipe stick or string.
9. Check there are no overhead lines in close proximity to the lifting position.
10. Check that all of the fittings and attachments required to ensure that the Mini 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 (m.) |                   |                    | Width       |
|                             | Up to 3' of cover         | 3' to 6' of cover | 6' to 10' of cover |             |
| 4"                          | 5                         | 6                 | 7                  | 750mm / 30" |

Note, to use the Mini 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 MINI PIPE HANDLER TO AN EXCAVATOR

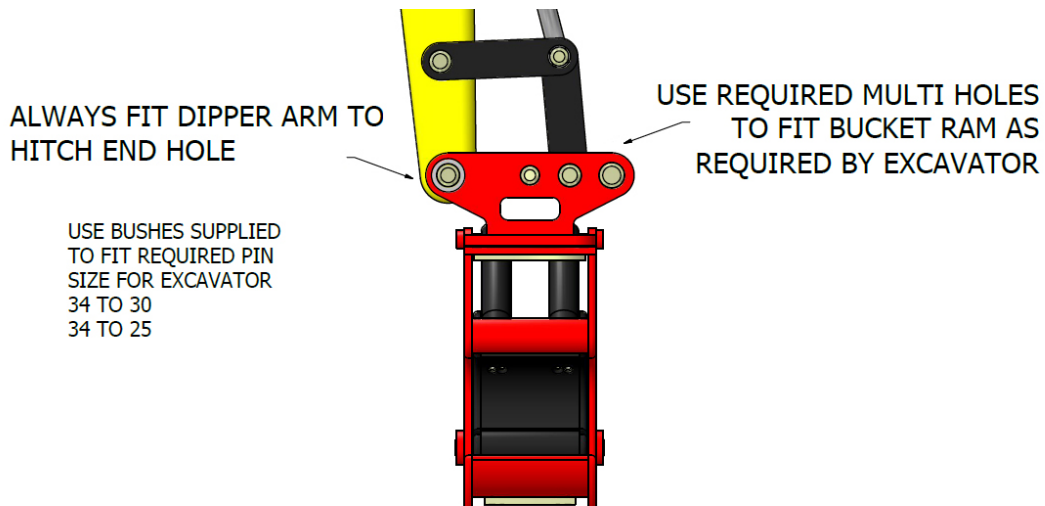
There are different excavators being used on site however the Mini Pipe Handler is designed to fit to most excavators known commonly as 'mini diggers'.

The top bracket will take the pin arrangement for 1½, 2 and 3 tonne models depending on the mini excavator. See drawing below indicating which pin slots to use.

The hose arrangement on the single acting Mini Pipe Handler will fit the typical hose arrangement found on most excavators. This is the **3/8" flat face coupler**, and is a single connection, usually the male into the female coupler on the digger.

Common sense must take place when using the Mini Pipe Handler and operatives should avoid placing themselves underneath the unit and stay clear of the moving arm of the excavator.

*Image 5, Swivel Mount connection to mini excavators*



INCORRECT FITTING CAN RESULT IN DAMAGE TO HITCH IN SOME CASES

### **Fitting the Mini Pipe Handler to Excavator using Bucket Pins (*See Image 8 page 11*)**

1. Ensure all the correct fittings are available to allow connection onto the excavator.
2. Unload the Mini Pipe Handler as described on pages 7 and 8.
3. Position the excavator so that the arm can be lowered on to the Mini Pipe Handler.

4. With the excavator arm aligned with the pins slots slide the bucket pins fully through the swivel bracket and secure on the other side using R-Pins as shown on Image 6 below.
5. Connect the hose into the correct flat face coupling (3/8") and secure the knurled swivel (see Images 9 and 10 on page 12).
6. Ensure no hoses are restricting the movement of the Mini Pipe Handler.

## FITTING THE MINI PIPE HANDLER TO AN EXCAVATOR (continued)

### Fitting the Mini Pipe Handler to Excavator using a Pin System Quick Hitch (See Image 8 below)

1. Ensure all safety devices, pins, locks etc. are available, fitted and checked by the machine operator before using the Mini Pipe Handler.
2. Unload the Mini Pipe Handler onto horizontal ground within the cordoned off area
3. Rotate the swivel mount to align with the excavator arm.
4. **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.
5. **Retain** the Mini 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.
6. **Secure** the Mini Pipe Handler to the quick hitch by inserting the safety pin.
7. Connect the hose into the correct flat face coupling (3/8") and secure the knurled swivel (see Images 9 and 10 on page 12).
8. Ensure no hoses are restricting the movement of the Mini Pipe Handler.

*Image 7 and 8: Mini Pipe Handler connected to an excavator using bucket pins on the left and a quick hitch on the right (note the swivel bracket shown is the concept design which is different to the current design as shown pages 5, 6 and 10).*

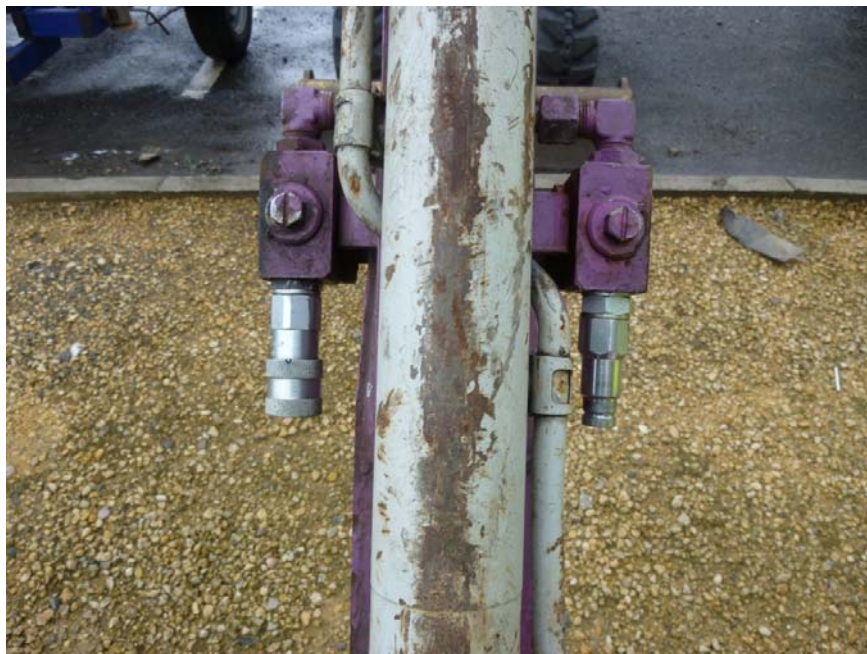


## FITTING THE MINI PIPE HANDLER TO AN EXCAVATOR (continued)

### The Hose Arrangement

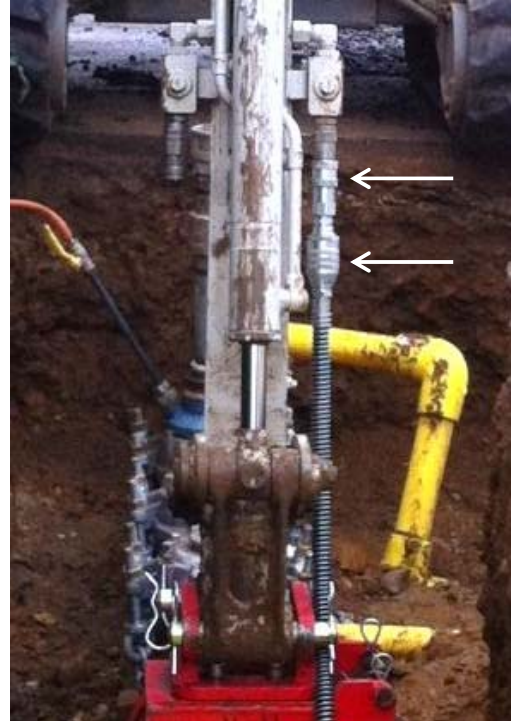
The single hose line from the Mini Pipe Handler will connect to the opposite fitting on the excavator and in most cases The Mini Pipe Handler leaves Steve Vick International with a 3/8" female flat face coupler which will connect to the male equivalent on the mini excavator.

*Image 9: Typical connections found on mini excavators*



The single acting Mini Pipe Handler will work on both single and dual feed excavators but still only needs the one hose connected. The gripping force is operated from within the cabin and the spring then forces the oil back through the system opening the top jaw. It may be the opposite pedal is depressed to allow the hydraulic oil to flow in the other. The Mini 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 (bottom arrow opposite – see also page 3)

Image 10 opposite shows the female 3/8" flat face coupling (top arrow)



### OPERATING THE MINI 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 during inserting the pipe is that the pipe is not to be pulled up or pushed downwards whilst 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 11 and 12 on page 14.

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

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

## Operating the Pipe Handler – See Images 11 to 14

1. Ensure top jaw of Mini Pipe Handler is on the open position (spring loaded or foot pedal manipulation).
2. Locate the Mini Pipe Handler 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 ensuring the Mini Pipe Handler is at right angles to the PE (see *Images 8 and 9 on page 14*).
5. Operate the controls on the excavator to bring the PE into the host main using technique described above.
6. Once the PE has been pushed in, release the foot pedal and allow spring to open top jaw. On dual flow the opposite pedal will do this operation.
7. If the top jaw is slow to open or does not open at all open fully the flow control valve on the hose line.
8. Slide the Mini Pipe Handler back up along the PE and repeat process above and at all times maintain a controlled, level and safe position of the Mini Pipe Handler to ensure no damage to the PE.

At all times maintain SAFE DIGGING PRACTICES when using the Mini Pipe Handler to avoid potential PE damage

## OPERATING THE PIPE HANDLER (CONTINUED)

*Image 11: Correct alignment of Mini 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.*





Image 12: Short steady stroke maintaining the correct alignment ensuring there is no twisting, pulling or pushing down on the PE pipe.



## OPERATING THE PIPE HANDLER (CONTINUED)

Image 13: Typical foot pedals found in a mini excavator. Usually the pedal arrangement on the left foot as you occupy the cabin will operate the 3<sup>rd</sup> service (breaker line). **It may be necessary to adjust the feed screws underneath the pedals to allow the hydraulic oil line to flow.**



*Image 14: Operating the foot pedal in the cabin of the mini excavator.*



## **USING THE MINI PIPE HANDLER WITH BUTT FUSION MACHINES**

Image 15 below shows how on stiffer pipe like 125mm PE the Mini Pipe Handler when connected to the mini excavator can alleviate the problem of lining up PE on butt fusion machines. Locate the Mini Pipe Handler alongside the butt fusion machine, switch off the power line so no accidental movement can occur, align the cabin and one end of PE pipe is secured ready for butting to the next coil/stick.



*Image 15, Mini Pipe Handler and butt fusion machine.*

## 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 Mini 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