



# INSTALLATION MANUAL FOR INFRAPIPE CIVILPIPE

All product MUST be inspected on arrival. For further information on **Inspection on Arrival** please [visit this link](#) or use this QR code:



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Further information including the [Data Sheet](#) for CIVILPIPE can be found in the [Downloads section](#) of the [INFRAPIPE website](#).

## HANDLING

This section specifically outlines the requirements for the handling of INFRAPIPE™ pipes and fittings that have been inline extruded – CIVILPIPE8, CIVILPIPE16 and FARMPIPE. Spiral-wound (KRAH) products – INFRAPIPE, INFRATANK, ECOPIPE and manholes – have additional requirements, please read the [separate guide accessible here](#).

### LOADING & UNLOADING

Polyethylene and polypropylene pipes and fittings are light in weight and easy to handle compared to many other materials. They have considerable resilience, flexibility and resistance to impact, however CIVILPIPES and fittings can be scored by sharp edges and can be distorted under load, particularly at higher temperatures. Therefore, in general, PE pipes and fittings shall not be dropped, indented, crushed or impacted and shall not be subjected to rough handling during loading and unloading operations.

- The vehicle must be stopped and braked on level ground with sufficient room for the loading/unloading operation.
- Appropriate personnel exclusion zones shall apply when lifting CIVILPIPE in order to avoid injury if the pipe slips.
- In hot weather with black pipes the pipe surface may become hot and gloves or other protection may be needed.



- When removing securing straps or chains, care must be taken to ensure the load has not shifted.
- Lifting of individual pipes or packs up to 6.5m in length may be performed by a forklift.
- Ensure fork tines are in the widest position.
- When lifting packs of pipes, the tines of the forklift must be placed under the entire pack, and the tines not pushed into the pack.
- Operate with the load as close to the ground as practicable without risking contact to the ground.
- Neither pipes nor packs can be lifted by hooks, strops or ropes that are fed through the pipe or act on the ends of the pipe alone.

#### POINTS TO AVOID

- Damage to or crushing of the socket.
- Twisting, damaging or cutting the straps, twine or boxing.
- DO NOT FORGET THE RUBBER RINGS if ordered.
- It is important to ensure the socket or spigot ends of the pipe are not supporting any of the pipes weight when loaded/unloaded as this can impact the reliability of the pipe joint.

## TRANSPORTATION

CIVILPIPE and FARMPipe are transported in crate lots for sizes 100-525:

CIVILPIPES shall be supported and secured in a way that prevents excessive deformation to the pipe cross section and shall minimise the risk of bowing or twisting the pipes.

It is important to note that the height of the stack shall be limited if there is a risk of damaging or deforming pipes. Nesting of pipes inside each other is encouraged as this is not only an economical way of transporting CIVILPIPE or FARMPipe, but an advantage of the lightweight profile pipe system.



**Ratchet tie downs with safety latches are the preferred method of restraint for transportation**



All supports, restraints and packing will be transported in a manner to prevent point loading, scraping, shock or any other damage during transit. CIVILPIPE is best tied down using nylon ratchet tie-downs and if chains are used, they should never come into direct contact with the pipes and fittings.

### MOVING THE PIPE ONSITE

- If pipe needs to be moved onsite, then it is to be done in accordance with loading and unloading as above.
- When the pipe is moved, sufficient dunnage needs to be available so that the pipes can be laid down on suitable dunnage.
- Do not drag or pull the pipe.
- Ensure ends, sockets or spigots are protected from damage or the ingress of material.
- Individual pipes may be moved by and provided that staff have the appropriate protective footwear, a clear view of their route and a good grip of the pipe.

## STORAGE

Suitable storage sites are to be chosen that have enough area to store any pipes that will not be in use throughout the installation project. When selecting a storage area, it is important to consider:

- The site is level and firm.
- It is clear of combustible materials to minimise the risk of fire damage.
- If long-term storage is required (2 months or more) the pipes may need to be covered. If in doubt, cover the pipes.
- There is no obstruction to vehicles, pedestrians, and property access.
- All pipes are stored 2 metres away from a trench or excavation.



Pipe Storage

There can be risk to personnel from unsafe storage in particular - avoid the following:

- Storing different size crates on each other.
- Differential heating and cooling of exposed pipe lengths due to the tracking of sunlight may cause pipe stored on racks to move and possibly fall causing serious injury or death. When storing pipe in elevated racks ensure the pipe is well restrained and unable to fall.



### IMPORTANT ASPECTS TO CHECK ARE:

- Avoid sunlight and other heat sources where possible.



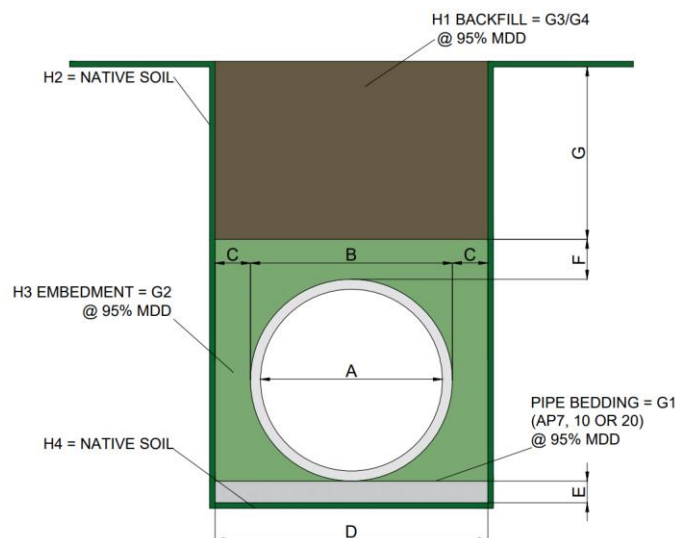
- Avoid potential contact with oils, petrols, solvents or chemicals.
- The sockets, spigots or ends of the pipes are free from any load and all ends are clear of debris.
- Ensure that the bottom layer of pipes that are stored in stacks are not going to deform over time under load.
- Pipes are supported in a manner that will limit longitudinal deformation.
- If pipes are stored loose then adequate chocks must be provided to prevent the stack collapsing.
- If unsure, please check with the Project Manager allocated by INFRAPIPE™.

### RUBBER RINGS & FITTINGS

- If the pipes are accompanied by rubber rings these will be packaged in one sealed plastic bag. This should be kept in a safe place and only opened prior to the use of the rings.
- PP or HDPE fittings are lightweight and robust, but care must be taken not to crush the sockets.
- UPVC fittings are heavy, and care should be taken when lifting these.
- Fittings are accompanied by rubber rings, ensure these are kept safe.

## TRENCH DESIGN

Backfill should be engineered fill – ideally Ap or GAP 7, 10 or 20. More detail can be found in AS/NZS 2566.1:1998 *Buried Flexible Pipelines: Structural design* and AS/NZS 2566.2:2002 *Buried flexible pipelines – Installation*.



### TRENCH DIMENSIONS

TRENCH WIDTH is shown in Table 1, derived from  $2 * C$  (Side Width) plus  $B$  (OD)

PIPE SECTION DEPTH ( $E + B + F$ ) is Bedding, OD and Backfill

TRENCH DEPTH is DEPTH OF PIPE SECTION plus the additional backfill required to ground level. For trench depths of 5m+ contact INFRAPIPE for an engineering opinion

COVER HEIGHT ( $F + G$ ) must be equal to or greater than the heights in Table 2 below.

$$\text{TRENCH DEPTH} = \text{DEPTH OF PIPE SECTION} + \text{COVER DEPTH}$$





**Table 1 Trench dimensions in mm**

DN	B OD	C SIDE WIDTH	D TOTAL WIDTH	E BEDDING DEPTH	F BACKFILL DEPTH	H – DEPTH OF PIPE SECTION
100	115	100	315	75	100	290
150	171	100	371	75	100	346
200	230	150	530	100	150	480
225	254	150	554	100	150	504
300	345	150	645	100	150	595
375	437	200	837	100	200	687
450	523	200	923	100	200	773
525	611	300	1211	150	300	911
600	702	300	1302	150	300	1002
800	936	300	1536	150	300	1236
1000	1166	350	1866	150	350	466

**Table 2 Minimum cover heights in mm**

Loading condition	mm	Loading condition	mm
Not subject to vehicles	300	Vehicle load no carriageway	450
Land zoned for agricultural use	600	Vehicle load unsealed carriageway	750
In embankments or construction eqpt loads	750	Vehicle load sealed carriageway	600

**For situations outside the above or depths of 5m+, contact INFRAPIPE for an engineering opinion.**

**Table 3 CIVILPIPE DETAILS**

DN	ID (A) mm	Crate Quantity	Cross Section Area mm	Effective Length mm	Overall Length mm	SN8 HDPE Weight (KG)	SN16 PP Weight (KG)
100	98	30	2533	6413	6490	5	N/A
150	147	23	5294	6348	6461	8	N/A
225	218	6	10910	6283	6429	17	19
300	295	2	22796	6188	6389	28	32
375	375	2	39540	6188	6390	45	52
450	450	2	55786	6123	6340	70	80
525	525	2	76730	6041	6317	95	109
600	600	1	104304	5920	6273	115	132
800	800	1	185429	5936	6272	195	224
1000	1000	1	282395	5892	6283	324	372



**Table 4 Indent Dimensions in mm**

DN	Indent Depth	Indent Length	Witness mark # of rings
100	15	150	6
150	20	150	5
200	20	200	5
225	20	200	5
300	25	250	4
375	25	300	5
450	25	300	4
525	25	300	4
600	25	400	6
800	25	450	4
1000	25	500	6

## JOINING THE PIPE

### CUTTING

When cutting follow these instructions:

1. Wear appropriate PPE.
2. Support the pipe so that it is flat and will be restrained before and after the cut.
3. Cut in the groove (narrowest part) of the pipe.
4. Cut squarely throughout the cut.
5. Remove all burrs.
6. Create a new witness mark equal to the length of the socket that the pipe is being inserted into (see Table 5 on the next page for location).





## JOINING

CIVILPIPE is joined by a **rubber ring which is ORDERED SEPARATELY** and will accompany the pipe and be sealed in a bag and undamaged on receipt. These rings are made in NZ to AS1646.2:2000 *Elastomeric seals for waterworks purposes*. Fittings are accompanied by a rubber ring for each socket.

When joining one CIVILPIPE to the next, follow these instructions:

1. Inspect socket and spigot for damage or debris and clean as required.
2. Place the rubber ring on the **FIRST FULL GROOVE** on the spigot.
3. Apply pipe lubricant generously to the socket (not the spigot).
4. Lift the pipe into the trench.
5. Ensure the pipe alignment is correct, and an indentation has been formed below the socket to ensure the pipe alignment is unaffected – see table 4 below for approximate indent dimensions.
6. Push the spigot end into the socket up to the witness mark. Force can be applied with a lever for smaller diameters or mechanically for larger diameters.
7. When applying force always:
8. Use a protective plate or pad to minimize point load on the pipe end.
9. Position the centre of the arc of swing perpendicular to the pipe so that the force is applied evenly in line with the pipe.
10. Mark the pipe or witness mark so it is visible from outside the trench when the pipe is in position to prevent over-compression.

## CONNECTING THE PIPE

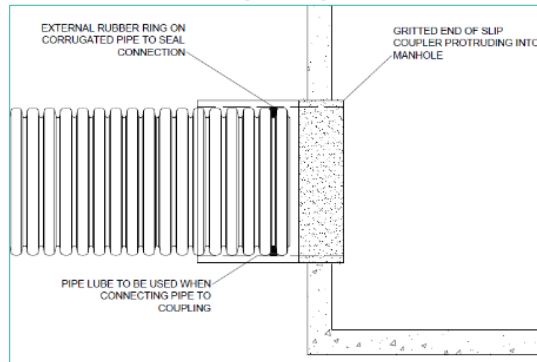
### CONNECTING TO MANHOLES

CIVILPIPE is joined to HDPE manholes with sockets or plain ends and extrusion welds. For concrete manholes, connections can be achieved in the following ways:

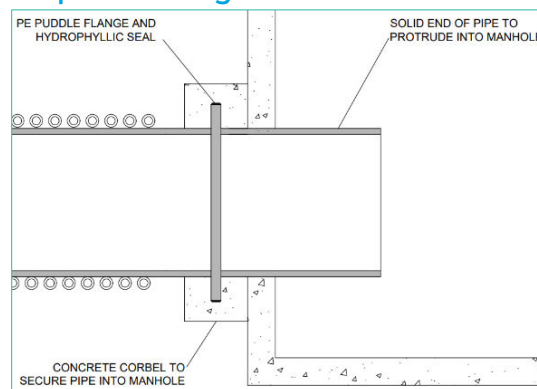
1. Using a standard manhole connector (DN100-DN450).
2. Using a custom-made fitting such as a slip coupler (DN375-DN1000).
3. Creating a concrete/epoxy mortar corbel around the join (DN100-1000).
4. Using a join to an INFRAPIPE KRAH pipe and then a puddle flange and/or hydrophillic seal in conjunction with a concrete/epoxy mortar corbel (DN375-DN1000).



### A slip coupler



### A puddle flange and concrete corbel



### A manhole connector



## CONNECTIONS TO OTHER PIPES

Join CIVILPIPE to other pipes of HDPE/PP, PVC, concrete or clay with slip couplers, PE Restraint couplers, shearbands or Hermetica clamps.





## FITTINGS

The CIVILPIPE range is supported with stock fittings in the 225-600 diameters. For other requirements or other diameters contact INFRAPIPE for a customised solution which is easily achievable using the KRAH technology.

- UPVC fittings are available for 45 and 90 degree bends for 225-450.
  - UPVC fittings are available for 45 degree (WYE) and 90 degree (TEE) junctions for 225-450.
  - UPVC reducing junctions are available on request for 225-450.
  - UPVC concentric reducers and couplers are available for 225-450.
  - PP Welded SN16 fittings are available for 45 degree (WYE) and 90 degree (TEE) junctions for 225-600.
  - PP Welded SN16 fittings are available for 11,22,33,45 and 90 degree bends for 225-600.
  - HDPE Welded SN8 fittings are available for 45 degree (WYE) and 90 degree (TEE) junctions for 225-600.
  - HDPE Welded SN8 fittings are available for 11,22,33,45 and 90 degree bends for 225-600.
  - HDPE KRAH SN8 or SN16 fittings for 450-1000 are available on request.
- ✓ In diameters 100-450, any custom design or fitting can be achieved with PVC donor pipes
  - ✓ In diameters 450-1000, CIVILPIPE has been designed to integrate seamlessly with the INFRAPIPE KRAH system as they have identical ID, so any custom fitting can be manufactured to connect to CIVILPIPE.



## LIFETIME CARE

### Maintenance & modification

- Nil maintenance of this product is required.
- For modifications, contact INFRAPIPE who can advise on the best way to achieve this.
- For full details on how to care for the product read [INFRAPIPE Guide to Maintaining your warranty](#).
- Due to the wall thickness of this product, consult INFRAPIPE before welding.
- In the event of damage during or after installation, repairs can be conducted by cutting out the damaged section and using shear bands with a new section of pipe. For further advice, contact [INFRAPIPE](#).