

## Solutions for Trenchless Pipelines

**Jacking pipe** usually employs hand excavation techniques at the "face" using handcarts, conveyor belts and small machines to remove soil. (Sophisticated "tunnelling" machines may be employed on large scale contracts) Construction proceeds by jacking pipes one at a time into the face of the excavation. Typically 1050 mm to 3000 mm diameters.

**Thrusting pipe** uses non-manual excavation techniques to remove soil during construction. Horizontal boring (directional drilling) and water jetting is commonly used. The pipe is pushed through the near perfectly formed hole. Typically 225 mm to 900 mm diameters.

Both methods are used as an economical alternative to trenching where pipelines are laid at depths greater than 5 metres for lengths longer than 50 metres.

### Features

- Installation without disruption to existing surface facilities or activities
- Capable of withstanding typical installation forces
- Strong and durable
- Proven performance

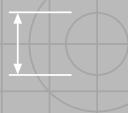
### Benefits

- Low impact on existing services
- Adaptable to various ground conditions
- Cost effective compared to deep traditional methods
- Reduction of health and safety risk when installing in unstable soil conditions

### Applications

- Stormwater drainage
- Sewerage systems
- Under roads, railways, waterways or developed areas.





## Titan® Pipe

The Humes Titan® jacking and thrusting pipes are industry benchmark pipes, made to NZS 3107:1978 under tightly controlled ISO 9000 certified quality management systems.

## Loads

Two loading situations must be considered, the traditional **earth load** and the generally more important **construction load**.

Earth loads (vertical) are minimized by installation type. Loads are less than those generated by the narrowest possible trench and in "strong" soils the pipe may not be subjected to any vertical load at all.

Construction loads (horizontal) result from jacking or pushing the pipe into its final position. Depending on the soil type these loads can vary from between 0.5 tonnes/m<sup>2</sup> to 2.0 tonnes/m<sup>2</sup> of the outside surface area of the pipeline.

Thrusting construction loads are generally less than jacking loads as a result of the more accurate and stable preformed hole. In the best situation the push required to install the pipe is limited to the force required to overcome friction of the pipe sliding along the invert of the hole, typically pipe weight x 0.5.

For both Jacking and Thrusting, construction loads can be reduced significantly by lubricating the outside pipe surface (bentonite). When Jacking loads are still excessive, intermediate jacking stations can be used.

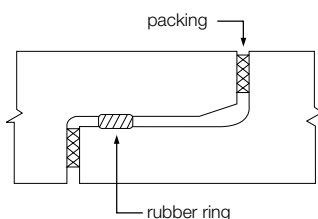
## Joint Packers

Joint packers, usually made of ply or high density particle board, are required to spread loads across the joint face and provide some deflection capability during installation. Joint packers are not supplied by Humes. Steering bands can be supplied upon request. Rubber ring joints must be lubricated with a non-petroleum based lubricant such as Easy Slip. Apply liberally to ring and collar jointing surface, particularly the lead in.

### In-wall with Skid Ring Joint (No Steering Band Required)

Nominal Diameter	OD (mm)	Effective Length (mm)	Wall (mm)	Mass (kg)	Jacking Capacity(t)
225	363	1937	67	302	55
1540	1840	2457	150	5,608	725
1950	2261	2438	140	5,880	815
2550	2883	2438	165	8,928	1300
3060	3410	2400	175	10,995	1400

Note: 225 available with optional 837mm effective length.

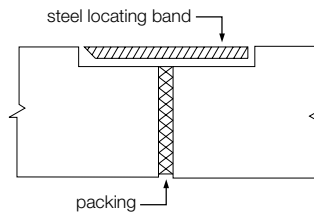


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### Butt Joint without Rubber Ring (Steering Band Required)

Diameter	OD (mm)	Length (mm)	Wall (mm)	Mass (kg)	Jacking Capacity(t)	Band (mm)
300	362	2200	32	192	33	100x5
375	444	2200	32	286	41	100x5
450	533	2100	41	405	62	100x5
525	616	2100	45	547	80	100x5
600	698	2380	56	717	110	140x6
825	946	2380	70	1,259	180	190x8
900	1028	2380	73	1,379	230	190x8
1050	1194	2380	84	1,831	289	150x8
1200	1359	2380	90	2,241	355	190x8
1350	1524	2380	96	2,692	426	170x8
1500	1676	2380	104	2,396	547	190x8
1650	1841	2380	111	3,808	614	190x8
1800	2006	2380	118	4,375	705	190x8

All masses and wall thicknesses based on Z class specification.

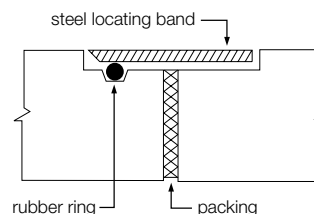


### Butt Joint with Rubber Ring (Steering Band Required)

Diameter	OD (mm)	Length (mm)	Wall (mm)	Mass (kg)	Jacking Capacity(t)	Band (mm)
300	362	2200	32	192	23	100x5
375	444	2200	32	286	29	100x5
450	533	2100	41	405	55	100x5
525	616	2100	45	547	68	100x5
600	698	2380	56	717	95	140x6
750	863	2380	67	1,061	144	150x6
825	946	2380	70	1,259	161	190x8
900	1028	2380	73	1,379	230	190x8
1050	1194	2380	84	1,831	289	190x8
1200	1359	2380	90	2,241	355	190x8
1350	1524	2380	96	2,692	426	190x8
2100	2362	2200	*126	5,172	660	250x10

All masses and wall thicknesses based on Z class specification.

\*2100 wall thickness X class.



Notes: Jacking capacity calculated at 12MPa Uniform stress under packer

All Jacking Pipes are made to order due to specific job requirements.

