

Rural solutions

Issue 2



Rural Solutions

After 100 years of manufacture, the Humes product range has never been more diverse, competitive, or in-tune with our clients' needs than it is today. With our extensive range of troughs, irrigation supply products and storage walls, we demonstrate a strong commitment to our rural customers.



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Livestock management

Humes manufacture and supply a wide range of concrete livestock management products which are ideal for Australian conditions.

Stock troughs

Humes stock troughs provide many benefits to landholders:

- 40MPa concrete gives the trough an extremely tough and durable composition.
- 500MPa N-class steel reinforcement gives the trough additional strength and durability to sustain bumps or weathering.
- The weight of the trough eliminates the need for anchoring and ensures simple and secure placement.
- As concrete is UV and heat resistant, it keeps water cooler in high temperatures.

To determine the appropriate trough volume for any application, consumption calculations must consider the size and quantity of the stock as well as the climate and composition of the pasture. Table 1 below is a guideline for average daily water requirements of stock. Trough styles and dimensions are shown in tables 2 - 4.



Table 1 – Average daily water requirements of stock

| Stock | Variety | Litres per day |
|--------|----------------------|----------------|
| Sheep | Adult, grassland | 2 - 6 |
| | Adult, saltbush | 4 - 12 |
| | Ewes with lambs | 4 - 10 |
| Cattle | Lactating, grassland | 40 - 100 |
| | Lactating, saltbush | 70 - 140 |
| | Young stock | 25 - 50 |
| | Dry stock (400 kg) | 35 - 80 |

Source: NSW Department of Primary Industries (DPI), 'Water requirements for sheep and cattle', Primefacts, no. 326, January 2007.

Longline troughs

The longline troughs are traditionally used for watering larger stock holdings of cattle and sheep, and more recently for use in bore schemes in the western parts of New South Wales and Queensland.

There are two types of longline troughs; the sheep longline and the cattle longline. These troughs have a larger width to provide greater volume than the squareline trough range.

All longline troughs are provided with a 2" brass inlet to attach the float valve; the inlet can be reduced by the landholder if required. At the scour end the trough is sealed by a scour plug moulded from neoprene rubber (the 'scour end' is the draining/cleaning point of the trough).



Squareline troughs

The squareline troughs are traditionally used in smaller, confined areas for smaller numbers of stock. There are two types of squareline troughs; the sheep squareline and the cattle squareline.

All squareline troughs are provided with a 1" brass inlet to attach the float valve; the inlet can be reduced by the landholder if required. At the scour end the trough is sealed by a scour plug moulded from neoprene rubber (the 'scour end' is the draining/cleaning point of the trough).



Table 2 – Longline trough specifications

| Trough type | Dimensions (m) | Mass (kg) | Volume (L) |
|-------------|--------------------|-----------|------------|
| Sheep | 5.00 x 0.56 x 0.36 | 795 | 600 |
| Cattle | 5.00 x 0.59 x 0.36 | 902 | 800 |

Table 3 – Squareline trough specifications

| Trough type | Dimensions (m) | Mass (kg) | Volume (L) |
|-------------|--------------------|-----------|------------|
| Sheep | 2.44 x 0.56 x 0.35 | 404 | 300 |
| Cattle | 2.44 x 0.70 x 0.35 | 462 | 400 |



Feedlot troughs

Humes supply a range of feedlot troughs to cater for specific projects. The troughs are available in 2.46 m sections with an interlocking design, which enables continuous troughing to suit a variety of feedlot layouts. For a feedlot trough layout, or for more information, please contact your local Humes representative.

Roundline troughs

Roundline troughs are available in a wide range of capacities, diameters, and heights which makes them ideal for watering sheep, goats, horses, and cattle in a variety of applications. The troughs are also ideal for larger stock numbers as some have a greater holding capacity than the longline troughs.

The smaller roundline troughs are provided with a 1" brass inlet to attach the float valve; the inlet can be reduced by the landholder if required. The larger roundline troughs are provided with a 2" brass fitting to cater for larger float valves.

Fittings, valves and floats

Humes supply a large range of brass fittings, trough valves and floats.

Table 4 – Roundline trough specifications

| Trough type | Diameter (m) | | Height (m) | | Mass (kg) | Volume (L) |
|---------------|--------------|---------|------------|---------|-----------|------------|
| | Inside | Outside | Inside | Outside | | |
| Small cattle | 1.09 | 1.20 | 0.59 | 0.65 | 480 | 508 |
| Medium sheep | 1.39 | 1.52 | 0.37 | 0.45 | 650 | 535 |
| Medium cattle | 1.39 | 1.52 | 0.53 | 0.61 | 756 | 750 |
| Large sheep | 2.28 | 2.45 | 0.37 | 0.45 | 1,670 | 1,500 |
| Large cattle | 2.28 | 2.45 | 0.61 | 0.71 | 1,950 | 1,765 |

Stock underpasses

Precast arches

The precast arch is ideal for a wide variety of structures including stock crossings. The one piece arch has a span of 6 m to 12 m and is commonly used to construct tunnels for stock crossings. The wider range, spanning up to 21 m, is used to link both sides of a motorway and allow wildlife to cross safely.

Box culverts

Large box culverts (mainly 3 m wide and 3 m high up to 6 m wide and 6 m high) are an ideal solution for instant bridging for stock crossings under road and rail applications.

Steel reinforced concrete pipes

Humes offer a wide range of diameters, lengths and classes which are suitable for stock crossing applications. Humes reinforced concrete pipes are available up to DN3600 in standard strength (Class 2-4) and super strength (Class 6-10) load classes.



Irrigation supply

Humes provide irrigation supply solutions to enhance water conservation efforts throughout rural Australia. We have worked closely with landholders and engineers to improve the design and efficiency of their irrigation systems.

Steel reinforced concrete pipes

Rubber ring jointed pipes are recommended for irrigation applications where a pressure tight joint seal is required. Humes steel reinforced concrete irrigation pipes are available in two joint options; a belled socket joint for DN300 to DN1800 pipes, and an in-wall joint for pipes up to DN3600 (to accommodate the greater pipe wall thickness). While these joints are watertight they can provide a small amount of deflection, without compromising the joint integrity. Humes pipes can receive up to a 90kPa pressure rating within their joint and pipe barrel.

The inherent strength and durability of Humes' concrete pipes makes them a long term asset for any land holder, with a virtually unlimited service life for most common installations.

Most irrigation pipes need to be of high strength and Humes frequently manufactures non-standard class pipes to satisfy the requirements of specific projects. Pipelines under large embankments can range from Class 2 to Class 10.

Figure 1 – Belled socket pipe joint - cross section

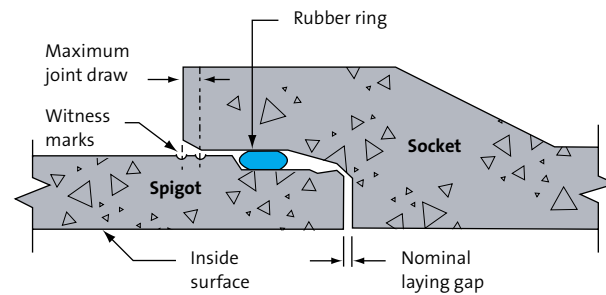
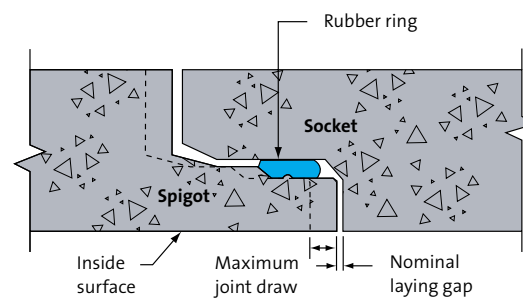


Figure 2 – In-wall pipe joint - cross section



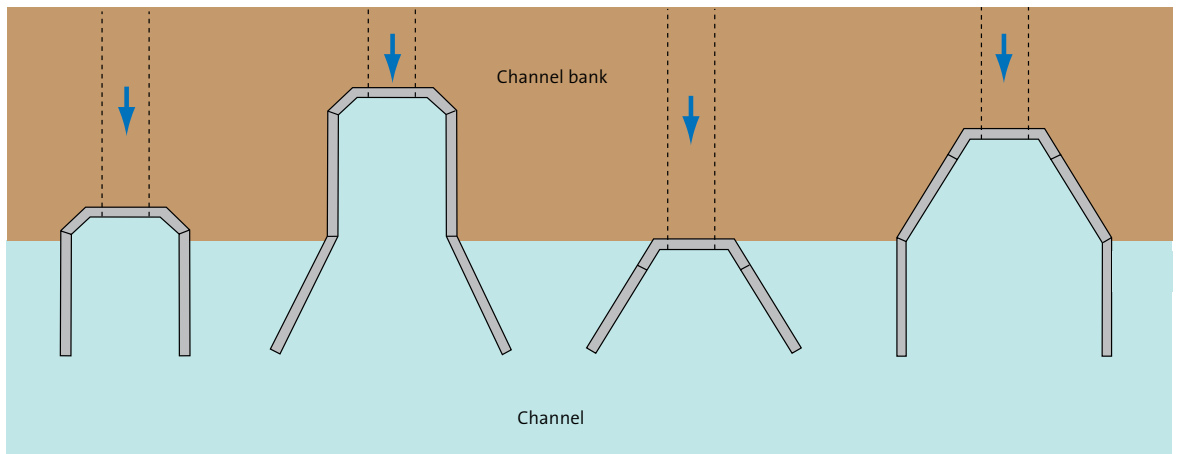
Irrigation headwalls

Irrigation headwalls are used to divert and channel water in and out of pipelines. Due to the varying structures required within the irrigation market, Humes has developed a bolt-together headwall system which allows for great variation in headwall sizing. Sloping headwalls and end walls are also available in some regions. The versatility of the Humes' headwall system is demonstrated by the easy reconfiguration of the standard layout.

Our design team can produce a dedicated headwall design for projects with specific needs.



Figure 3 – Headwall configuration examples - plan view





Drop boxes

A drop box structure enables irrigators to move water from tail water return drains into channels and then to on-farm storage. Humes can manufacture these units to suit any project, with varying heights, and placement of side voids to accommodate pipelines from any angle.

Figure 4 – Drop box application example - plan view

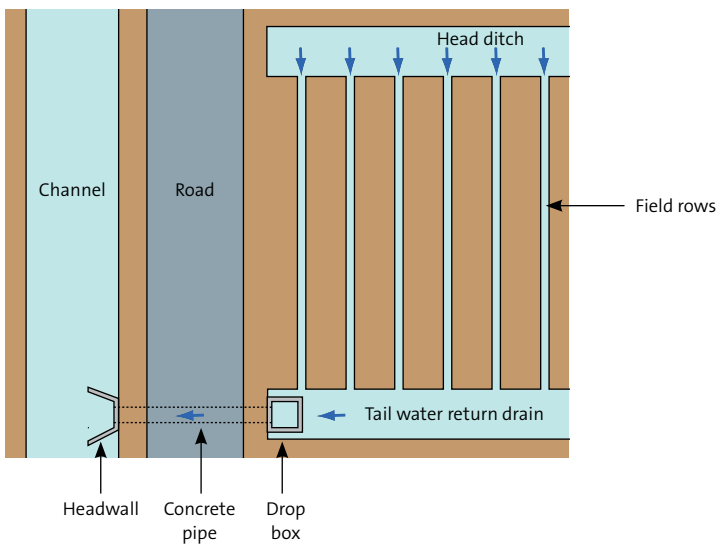
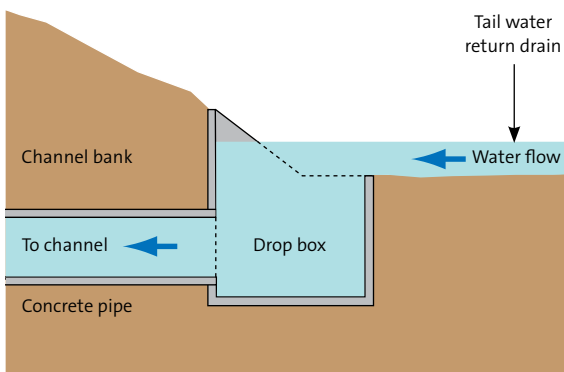


Figure 5 – Drop box application example - cross section



Mann irrigation pits

Mann irrigation pits are designed to house electro-magnetic meters which monitor the flow of water in an irrigation system. The accurate measurement of water flow is achieved by combining specially designed inlet and outlet structures, connecting pipes and an electro-magnetic meter. The meter and outlet control door are powered by solar panels, which allows multiple systems to be controlled from a central location.



Figure 6 – Mann irrigation pit - plan view

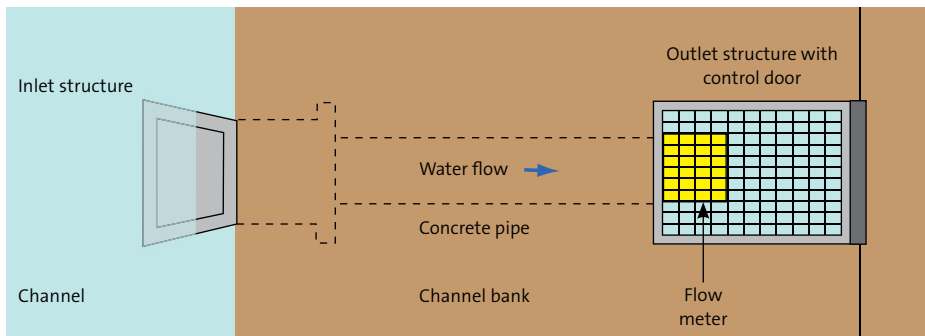
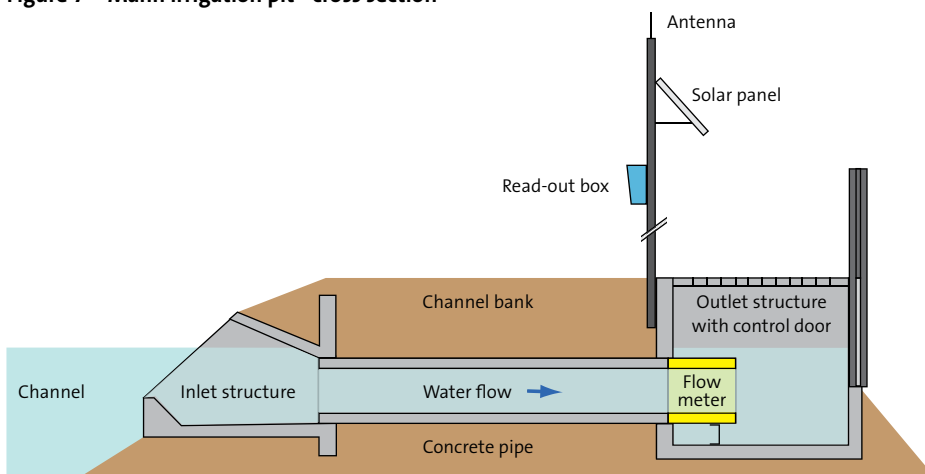


Figure 7 – Mann irrigation pit - cross section



Channel checks

A channel check enables irrigators to regulate or stop the flow of an irrigation channel. As a bolt-on system, these units can be installed in a variety of configurations.



Figure 8 – Channel check - plan view

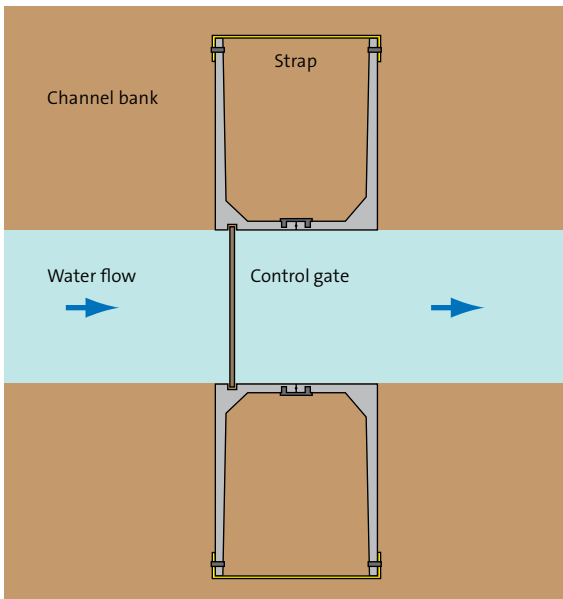
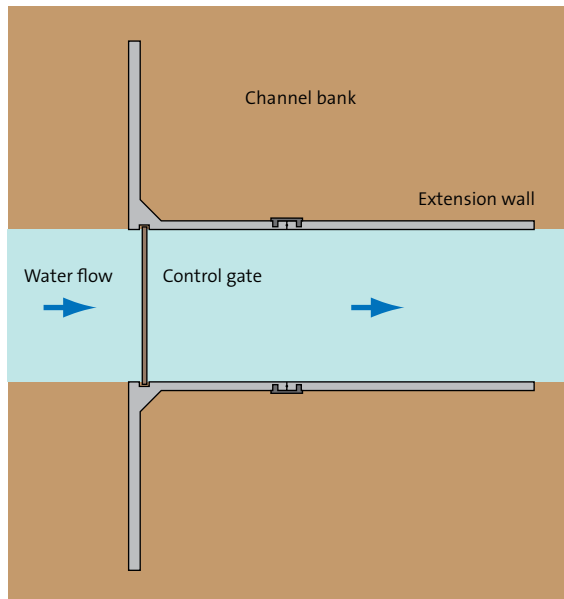


Figure 9 – Channel check with extension wall to reduce scour - plan view



Floodgates

The Hume-King floodgate (also known as a reflux valve or tidal flap) is an end-of-line, non-return valve which protects a pipeline from tidal inundation, the entry of debris, animals and vermin, and backflow. The floodgates provide a seal on the minimal vertical end of the pipeline, as the mounting pin (located behind the sealing surfaces) creates a moment-arm to hold the gate closed.

Hume-King floodgates benefit pipeline management through:

- high chemical resistance (to organic solvents, acids, alkalis, and salt water) which delivers a non-corrosive, durable pipeline solution
- resistance to sunlight, ensuring they will not warp in service
- manufacture from materials with low salvage value, discouraging theft and vandalism.

Hume-King floodgates are moulded from fibreglass reinforced polyester, with high tensile 316 stainless steel built-in hinges, and replaceable neoprene sealing rings. They are available to suit Humes standard pipe diameters, in a mounting-ring style for smaller diameter pipes, and a bolt-on style for DN1050 to DN1800 pipes.

Humes can develop and manufacture customised floodgates for non-standard applications.



Storage walls

Humes supply storage wall solutions for all types of bulk materials, with a range of temporary, permanent, standard and custom made options.

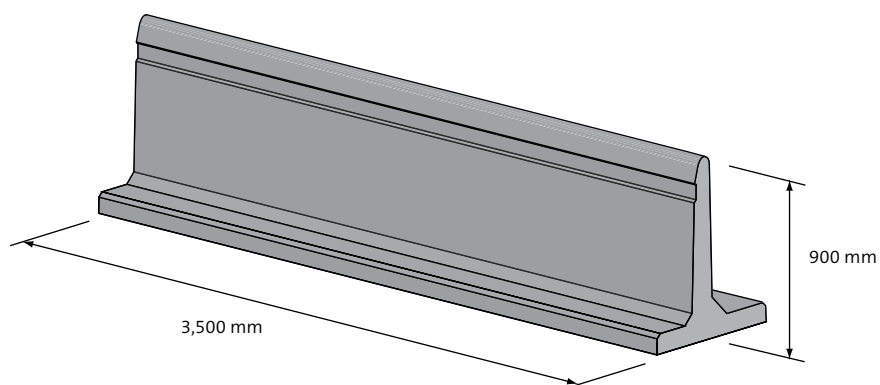
Grain handling barriers

Humes' precast concrete grain handling barriers have been specifically designed to store grain in stockpile situations and provide a number of benefits:

- Horizontal grooves allow clamping of tarpaulins for protection from vermin and the weather.
- The versatile design suits both indoor or outdoor applications.
- The simple design allows for fast and easy assembly and dismantling.
- There are no limitations in the length or shape of a storage area.
- It increases the capacity of a storage area compared to open stacks.
- Lifting lugs enable easy handling.
- Uniformity of structure enhances the appearance of storage areas.

Standard barriers are 900 mm high and 3,500 mm wide.

Figure 10 – Grain handling barrier



L and T walls

Humes manufactures modular cantilever storage wall units for retaining, separating and confining all types of bulk materials. Walls can be temporary or permanent and can be used for internal and external storage areas. The Humes storage wall units are a simple, safe reinforced concrete storage system with long service life and minimal maintenance requirements.

Humes manufactures two systems; the L wall and the T wall. Standard L wall units are normally used for single loading applications where materials are stored on the heel side of the wall only. Standard T wall units are normally used for double loading where materials are stored on both sides of the wall.

Both L and T walls can also be used in earth retaining applications especially with arch applications.

Special purpose wall units can also be manufactured to meet client requirements, including customised shapes or modifications to the standard unit height.



Table 5 – L and T wall unit specifications

| Unit height (m) | Unit mass (kg) | | | |
|-----------------|-----------------|--------|-----------------|--------|
| | 0.6 m wide unit | | 1.2 m wide unit | |
| | L wall | T wall | L wall | T wall |
| 1.1 | 185 | - | 365 | - |
| 1.5 | 405 | - | 795 | - |
| 2.4 | 780 | 930 | 1,530 | 1,830 |
| 3.7 | 1,855 | 2,235 | 3,645 | 4,395 |
| 4.6 | 2,645 | 3,165 | - | - |
| 5.5 | 3,940 | 4,685 | - | - |
| 6.1 | 4,020 | 4,765 | - | - |



Other solutions

Stormwater solutions

- Stormwater drainage
- Stormwater treatment
 - Primary treatment
 - Secondary treatment
- Detention and infiltration
- Harvesting and reuse

Sewage transfer and storage solutions

- Sewage transfer
- Corrosion protection for sewage system components
- Storage, overflow and pump stations
- Inspection and maintenance



Bridge and platform solutions

- Traffic bridges
- Pedestrian crossings
- Wharf structures

Tunnel and shaft solutions

- Access, pipe jacking and ventilation shafts
- Mine portals and reclaim tunnels
- Traffic and utility tunnels
- Escape tunnels and shafts

Walling solutions

- Earth retaining walls
- Wall panels



Potable water supply solutions

Traffic management solutions

Cable and power management solutions

Rail solutions

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