

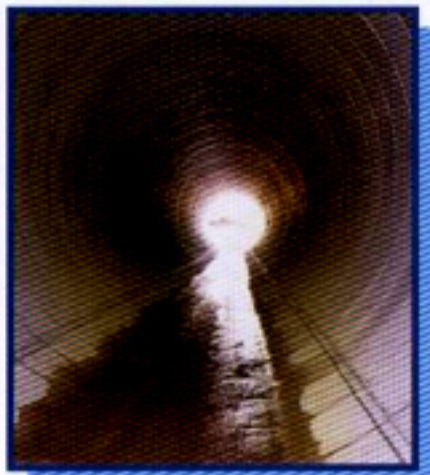
APPLICATIONS

DRAINAGE

For normal drainage and culvert application, Hume offers spun and vertical cast pipe in the range of 375mm dia. to 1950mm dia.

Depending on the type of soil bedding and design criteria, both rebated and rubber ring joints are available for selection.

In addition, Hume also produce vihy pipe to meet the demand for drainage pipes in the range of 150mm dia. to 450mm dia.

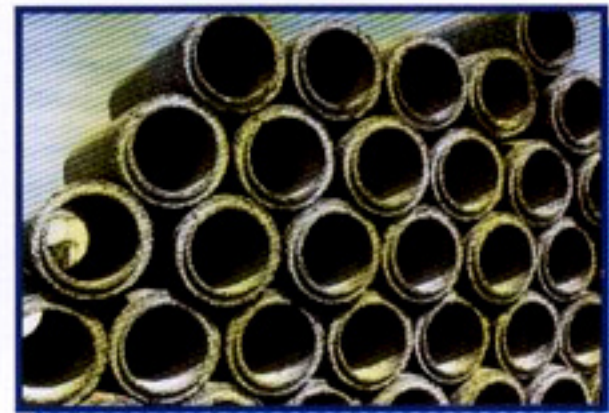


For larger pipe sizes requirement, Hume has now extended the range of pipes from 2100mm to 4800mm diameter. Besides for application as drainage pipe, these Larger diameter pipes (LDP) can be used in an exceptionally wide variety of situations such as service tunnels, water tanks, storage tanks, silos and pump well.

For special applications and requirements, please consult our sales team.

SUBSOIL DRAINAGE

Hume manufactures concrete porous pipes for use in subsoil drainage by using the vertical cast method. The pipes are produced to take a minimum crushing test load of not less than 20.2 kN per metre length of pipe. The pipes are available with rebated (ogee) joints in 150mm and 225mm internal diameter sizes.



STANDARD DIMENSIONS AND PROPERTIES OF SUBSOIL POROUS PIPES

Nominal Internal Diameter	Effective Length (Le) Per Pipe	Weight Per Pipe	Minimum Proof Load	Minimum Infiltration Rate
mm	mm	kg	(kN/m)	litre/min. per m length
150	1000	46	20.2	105
225	1000	69	20.2	158

applications

SEWERAGE

Hume concrete sewerage pipes are manufactured to provide a corrosion barrier to withstand corrosive attack while maintaining flexibility to withstand decades of severe services.

Advantages :-

- Resists hydrogen sulphide and other sewer gases, acids, alkalis and salts.
- The interior lining prevents the disintegration of the concrete.
- Resistant to wide variety of chemicals.
- Unaffected by fungus or bacterial action.
- Unaffected by continuous exposure to high humidity or water.

Design and specification :

Hume sewerage pipes are available in sizes and classes similar to those of culvert and drainage pipes. Hume sewerage pipes come in different categories or protection lining ;

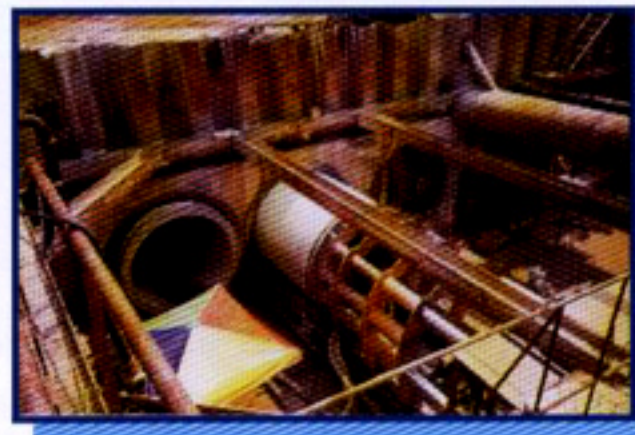
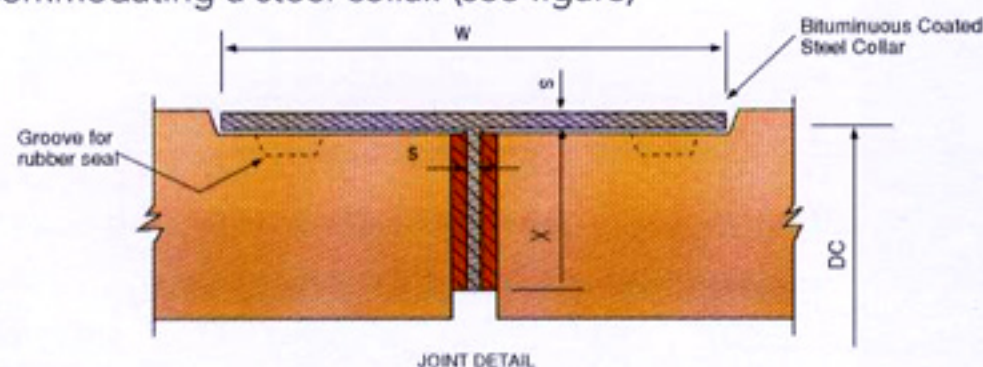
- Using a 12mm (1/2") thick layer of High Alumina Cement which conforms to the K.L. City Hall requirements for sewerage pipes.
- Using Sulphate Resisting Cement to British Specification BS 4027 - 1966.
- For aggressive corrosive conditions, the pipes can be lined internally with a blanket of PVC sheet. This is the Hume "Plastiline" pipe, which is used extensively in Australia and Singapore.
- Using sacrificial concrete lining of 20mm or 38mm.

Hume sewerage pipes utilize the Rubber Ring Joint for water tightness and protection from the surrounding environment. Other type of joints are not recommended.



JACKING (Drainage & Sewerage)

Hume Jacking Pipes permit the installation of pipe culverts for drainage or sewerage purposes under major highways, roads and railway lines without the need for open excavation which invariably disturbs traffic flow. Recommended joint type is that of a butt joint with an external rebate accommodating a steel collar. (see figure)



For sewer lines, Hume Jacking Pipes can be made :

- 1) with an internal lining of 12mm thick High Alumina Cement
- 2) from Sulphate Resisting Cement (SRC)
- 3) with an internal PVC lining (minimum diameter 750mm)
- 4) with sacrificial concrete lining (20mm or 38mm)

SUMMARY OF JACKING PIPES PROPERTIES

NOM DIA	EXT DIA	Pipe Dimensions (mm)						Overall Length	Pipe Weight (Tonne)			Steel Collar Dimensions (mm)					Maximum Allowable Jacking Force On the Pipe (tone)		
		Internal Diameter			Wall Thickness				Class Z	Class 1.5Z	Class 2Z	S	W	Dc	X		Z	1.5Z	2Z
		Class Z	Class 1.5Z	Class 2Z	Class Z	Class 1.5Z	Class 2Z								Class Z	Class 1.5Z			
375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	533	-	385	375	-	74.0	79.0	3050	-	0.86	0.91	4.5	200	522	-	58.5	-	86	86
450	533	410	-	-	61.5	-	-	3050	0.71	-	-	4.5	200	522	46.0	-	65	-	-
	610	-	460	450	-	75.0	80.0	3050	-	1.02	1.08	4.5	200	599	-	59.5	-	102	102
600	699	570	-	-	64.5	-	-	3050	1.00	-	-	4.5	200	688	49.0	-	96	-	-
	775	-	610	600	-	82.5	87.5	3050	-	1.44	1.53	4.5	300	764	-	67.0	-	152	152
750	864	710	-	-	77.0	-	-	3050	1.51	-	-	4.5	300	853	61.5	-	156	-	-
	1016	-	760	750	-	128.0	133.0	3050	-	2.81	2.91	4.5	300	1005	-	112.5	-	350	350
900	1016	860	-	-	78.0	-	-	3050	1.84	-	-	4.5	300	1005	62.5	-	190	-	-
	1194	-	910	900	-	142.0	147.0	3050	-	3.69	3.81	6	300	1183	-	126.5	-	471	471
1050	1194	1010	-	-	92.0	-	-	3050	2.56	-	-	6	300	1183	76.5	-	283	-	-
	1346	-	1060	1050	-	143.0	148.0	3050	-	4.26	4.40	6	300	1335	-	127.5	-	543	543
1200	1346	1150	-	-	98.0	-	-	3050	3.06	-	-	6	300	1335	82.5	-	349	-	-
	1511	-	1210	1200	-	150.5	155.5	3050	-	5.06	5.22	6	300	1497	-	133.5	-	626	626
1350	1511	1300	-	-	105.5	-	-	3050	3.72	-	-	6	300	1497	88.5	-	405	-	-
	1676	-	1370	1355	-	153.0	160.5	3050	-	5.78	6.05	6	300	1662	-	136.0	-	715	715
1500	1676	1450	-	-	113.0	-	-	3050	4.43	-	-	6	300	1662	96.0	-	495	-	-
	1854	-	1520	1505	-	167.0	174.5	3050	-	6.99	7.28	6	300	1840	-	150.0	-	883	883
1650	1854	1615	-	-	119.5	-	-	3050	5.21	-	-	6	300	1840	102.5	-	593	-	-
	2032	-	1670	1655	-	181.0	188.5	3050	-	8.30	8.63	6	300	2018	-	164.0	-	1069	1069
1800	2032	1750	-	-	141.0	-	-	3050	6.68	-	-	6	300	2018	124.0	-	803	-	-
	2210	-	1820	1805	-	195.0	202.5	3050	-	9.75	10.09	6	300	2196	-	178.0	-	1272	1272
1950	2210	1900	-	-	155.0	-	-	3050	7.99	-	-	6	300	2196	138.0	-	983	-	-

Notes:

1. Two rubber seals per pipe (i.e.: 2 seals per joint) to be used in pipe jointing.
2. Internal lubrication of steel collar is recommended to facilitate installation of the joint.
3. Special features on pipe may be incorporated if required by client.
4. 2 grouting holes for jacking pipes of diameter 900mm and above will be provided located at 1/4 length from each end of pipe, diagonally to each other.
5. Hume is also able to manufacture pipes of other load capacities from different specifications.

FEATURES

SPECIFICATION

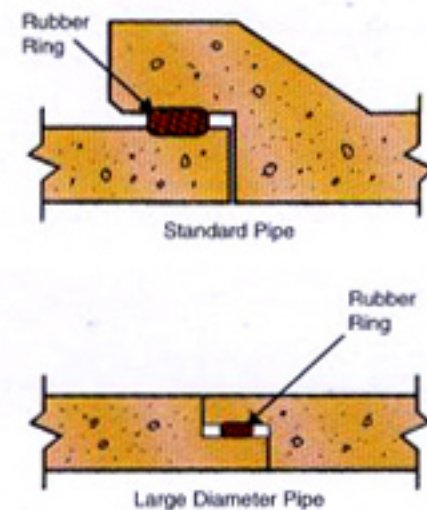
Hume concrete pipes are designed and manufactured in strict compliance to various established standards and specification as tabulated below :

TYPE OF PIPE	SPECIFICATION
SPUN PIPES	MS881 : Part 1 & 3 : 1991 (All Classes) AS 4058 : 1992, BS5911 : Part 1 : 1981
VERTICAL CAST PIPES	MS881 : Part 1 & 3 : 1991 (All Classes) BS 5911 : Part 1 : 1981 (All Classes)
VIHY DRAINAGE PIPES	MS881 : 1991 Class L AS 1342 - 1973 Class S
SUBSOIL POROUS PIPES	MS525 : 1977 BS 1194 : 1969
JACKING PIPES	As for Spun Pipe
LARGE DIAMETER PIPES	MS881 - 1991 AS 4058 - 1992.

TYPES OF JOINTS

SPIGOT & SOCKET JOINT

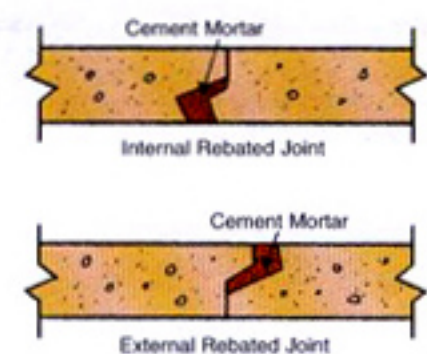
Also commonly called the Rubber Ring Joint (RRJ). RRJ provides water tightness and protection from the environment, and flexibility in concrete pipelines. A certain degree of linear deflection can be accomodated with this type of joint.



REBATED JOINT

An internal rebated joint is used for pipes of diameters 750mm and above while external rebated joints are used for pipes of diameters 600mm and below.

This is a rigid joint and deflection due to soil settlement occurring after installation may cause cracks in the joint, thus permitting leakage. These joints are not recommended where water tightness is critical.



TYPES AND RANGE OF SIZES

Standard Pipes - Nominal Diameters and Lengths Available (in metres)

Types of Pipe	Types of Joint	Class	Nominal Diameter (mm)																	
			150	225	300	375	450	525	600	750	900	1050	1200	1350	1500	1650	1800	1950		
SPUN PIPES Drainage	Rebated	All Classes	-	-	-	-	1.52	-	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52*	
	Spigot & Socket		-	-	-	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	-	
	Sewerage	Spigot & Socket With:	All Classes	-	-	-	-	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05*	-
		1) High Alumina Cement Lining		-	-	-	-	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05*	-
		2) Sulphate Resisting Cement		-	-	-	-	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05*	-
	3) Hume Plastiline	All Classes	-	-	-	-	-	-	-	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05*	-		
VERTICAL CAST PIPES Drainage	Spigot & Socket	All Classes	-	-	-	-	3.00	-	3.00	3.00	3.00	3.00	3.00	-	3.00	-	3.00	-		
VIHY PIPES Drainage	Rebated	L	1.00	1.00	1.25	1.25	1.50	-	-	-	-	-	-	-	-	-	-	-		
	Porous Subsoil	Rebated	L	1.00	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-		
JACKING PIPE Drainage & Sewerage	Butt with steel collar	Z, 1.5Z, 2Z, 2.5Z	-	-	-	3.05	3.05	-	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05		

All Classes = S, L, M, H, 1.5H, 2H, 2.5H available

* Only Classes S, L, M, H available

Large Diameter Pipes - Nominal Diameters And Lengths Available (in metres)

Types of Pipe	Types of Joint	Class	Nominal Diameter (mm)							
			2100	2400	2700	3000	3300	3600	4200	4800
DRAINAGE	Rebated	L, M, H, ** X, Y, Z or	2.50	2.50	2.50	2.50	2.25	2.00	1.20	1.20
	Spigot & Socket		2.50	2.50	2.50	2.50	2.25	2.00	1.20	1.20
SEWERAGE	Spigot & Socket with PVC lining	L, M, H, ** X, Y, Z or	2.50	2.50	2.50	2.50	2.25	2.00	1.20	1.20
JACKING PIPE	Butt with steel collar	Z, 1.5Z, 2Z, 2.5Z	2.50	2.50	2.50	2.50	2.25	2.00	1.20	1.20

Notes:

Hume can manufacture higher class (H+ or Z+) Large Diameter Pipes with different lengths. Please consult our sales team for detail.

** L, M, H to MS and BS

X, Y, Z to AS

CRUSHING LOAD TABLE

STANDARD PIPES

For convenience, the Crushing Load Table from MS 881: Part 1: 1991 is reproduced below:

CRUSHING TEST LOADS Kilonewtons per metre of effective length

Nominal size at pipe MM	Class L		Class M		Class H	
	Works proof load	Maximum load	Works proof load	Maximum load	Works proof load	Maximum load
150	20	25				
225	20	25				
300	20	25	23	29		
375	20	25	31	39	36	45
450	20	25	35	44	41	52
525	20	25	39	48	46	58
600	20	25	46	58	54	68
750	38	48	53	67	65	82
900	46	58	67	84	85	107
1050	51	64	76	95	96	120
1200	57	72	87	109	110	138
1350	63	79	95	120	122	153
1500	69	87	104	130	132	165
1650	75	94	116	145	146	183
1800	82	103	124	155	158	198
1950	88	110	135	169	169	212

CRUSHING LOAD TABLES

LARGE DIAMETER PIPES

Hume Large Diameter Reinforced Concrete Pipes can be supplied and load tested in accordance to either AS 4058 - 1992 or MS 881 - 1991.

Nominal Diameter (mm)	Test Load in kN/m to AS 4058 - 1992						Nominal Length (M)	Approximate Weight per pipe (Tonne)
	X		Y		Z			
	Proof Load	Ultimate Load	Proof Load	Ultimate Load	Proof Load	Ultimate Load		
2100	70	105	105	158	140	210	2.50	7.00
2400	78	117	117	176	156	234	2.50	8.75
2700	86	129	129	194	172	258	2.50	10.50
3000	94	141	141	212	188	282	2.50	13.25
3300	102	153	153	230	204	306	2.25	14.80
3600	110	165	165	248	220	330	2.00	15.00
3900	118	177	177	266	236	354	1.5	14.00
4200	126	189	189	284	252	378	1.2	15.00

Nominal Diameter (mm)	Test Load in kN/m to MS 881 - 1991						Nominal Length (m)	Approximate Weight per pipe (Tonne)
	L		M		H			
	Proof Load	Ultimate Load	Proof Load	Ultimate Load	Proof Load	Ultimate Load		
2100	96	120	146	183	184	230	2.50	7.00
2400	108	135	165	207	210	263	2.50	8.75
2700	124	155	186	233	235	294	2.50	10.50
3000	135	169	207	259	260	326	2.50	13.25

Notes:

- Actual dimension may varies.
- Weights shown are approximate. Actual figures will vary with the densities of concrete aggregates and details of reinforcement.

Hume is able to manufacture customised pipes with increased cover to reinforcement and pipes made with special cements. If pipes required are not described here, please contact the nearest Hume office or factory.

It is our policy to continuously review and improve products and their design. Information in this leaflet therefore subject to change without notice.

HUME CONCRETE MARKETING SDN. BHD. (8411-T)



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CERTIFIED TO MS ISO 9001 : 2000



CERTIFIED TO MS 881 : PT. 1 : 1991
 Precast Concrete Pipes with Flexible
 Joints for Drainage and Sewerage



CERTIFIED TO MS 881 : PT. 3 : 1991
 Precast Concrete Pipes with Open Joints



CERTIFIED TO MS 525 : 1986
 Concrete Perforated Pipes for Under Drainage