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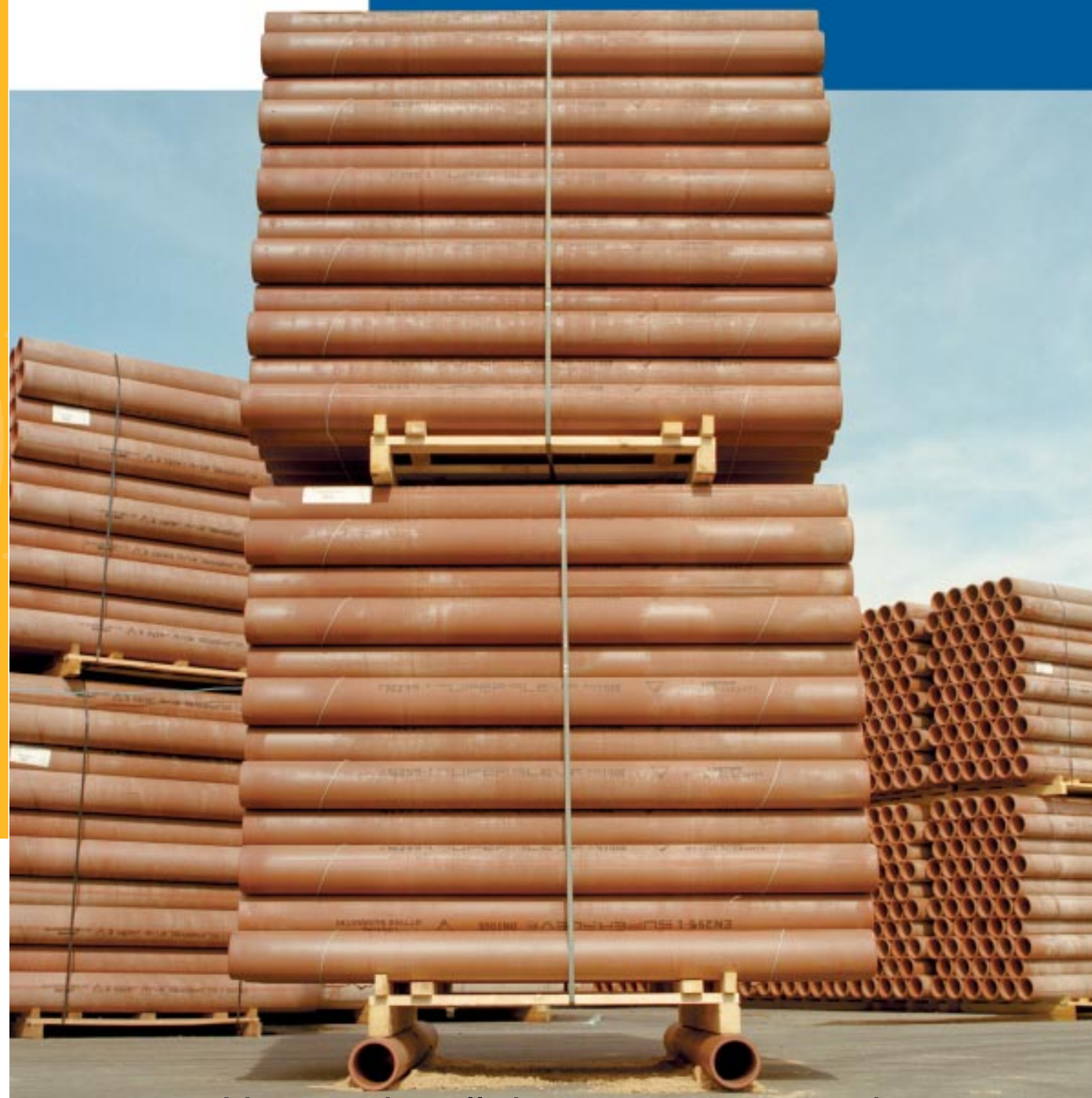
SuperSleve

Vitrified Clay Pipes



Hepworth…all the support you need

SuperSleve is a drainage system that combines inherent strength, reliability, durability and dimensional accuracy to give confidence in service and assurance in installation. Using the latest technological advances in materials, production and technical support, we are continually striving to provide the construction and civil engineering industries with the ultimate solution for every drainage application.

The SuperSleve drainage system has gained widespread acceptance and praise from both Contractors and Authorities, for its "user-friendly" features and performance benefits.

- **SuperSleve** pipes are almost **40% lighter** than traditional vitrified clay pipes offering considerable savings with on-site handling costs.
- **SuperSleve** is supplied in **longer lengths** – 100mm Ø are 1.60 metres, 150mm Ø are 1.75 metres, 225mm Ø and 300mm Ø are 2.00 metres.
- **SuperSleve** pipes are **collarless,** utilizing polypropylene couplings for jointing, which means no more burst collars.
- Their **dimensional tolerances** are better than the traditional V.C. pipes so jointing is always consistent and pipe lipping is eliminated.
- **SuperSleve** pipes have extremely low porosity. Unlike old V.C. pipes, they do not create a damp environment reducing the chances of root intrusion.
- **SuperSleve** pipes can be easily **cut and joined** at any length thus negating the need for expensive short pipes and eliminating wastage.

Installed Cost

Detailed cost analysis highlights the cost savings available in commercial drainage due to the ease of laying. The SuperSleve system is the cheapest system to install for commercial & industrial drainage when whole of life costs are considered.

Whole of Life Benefits

Many Authoritities are choosing SuperSleve because thorough Whole of Life Cost Benefit Analysis, which include reduced ongoing maintainance costs, prove SuperSleve to be the best choice for a long term asset.

Pipe	mm	100	150	225	300
1.6m		✓			
1.75m			✓		
2.00m with fixed coupling				✓	✓
2.00m with fixed coupling				✓	✓
Fittings	**mm**	**100**	**150**	**225**	**300**
Coupling (polypropylene)					
With standard sealing rings SBR		✓	✓	✓	✓
With EPDM sealing rings		✓	✓	✓	✓
With nitrile sealing rings		✓	✓	✓	✓
90° Bends (1/4 circle) Plain Ended		✓	✓	✓	
45° Bends (1/8 circle) Plain Ended		✓	✓	✓	✓
30° Bends (1/12 circle) Plain Ended		✓	✓	✓	✓
15° Bends (1/24 circle) Plain Ended		✓	✓	✓	✓
Flexible Bend (0-30°) Single Socket		✓			
45° Oblique Junction Plain Ended		100x100	150x100 150x150	225x100 225x150 225x225	300x100 300x150 300x225 300x300
25 Curved Square Junction (90°) Plain ended		100x100	150x100 150x150	225x100 225x150 225x225	300x100 300x150 300x225 300x300
Note: 225mm diameter and above are square junctions					
37 Oblique Saddle					
Small - for pipes less than 300mm dia.		✓	✓		
Large - for pipes larger than 300mm dia.		✓	✓	✓	
38 Square Saddle					
Small - for pipes less than 300mm dia.		✓	✓		
Large - for pipes larger than 300mm dia.		✓	✓	✓	

Fittings continued	mm	100	150	225	300
19 Rest Bend		✓			
Rest Bend Plain Ended		✓	✓		
46 Taper Pipe					
Taper Plain Ended 100-150mm		100x150			
150-200mm					
150-225mm					
200-250mm					
250-300mm					
SA Socket Adaptor - for connection to traditional pipes, channel fittings, etc		✓	✓		
AD Adaptor to HepSeal		✓	✓		
148A Low-back P-trap		✓			
Lowback P trap plain ended 150mm			✓		
158B Hopper, Square					
1002 Grid, alloy		✓			
1006 Sealing Plate, alloy					
261 Hopper, square, integral inlet complete with plastic grid		✓	✓		
1006 Sealing Plate, alloy		120			
1009 Hinged Grid and Frame alloy		120			
69 Access Pipe		✓	✓		
Alloy lid and frame (ISO) can be supplied to fit					

Adaptors (polypropylene)		mm	100	150	225	300
ADSS Adaptor Coupling to HepSleve			✓	✓		
Note: Other HepSleve adaptors - available on request						
Adaptors to waste pipes	**Nom**	**Grommet ID mm**				
SA4	1 1/4	33.5	✓			
	1 1/4/1 1/4	33.5/33.5	✓			
		33.5/39.25	✓			
SA5	1 1/2	39.25	✓			
		39.25/39.25	✓			
SA6	2	52.25	✓			
SA7	2 1/2	66.75	✓			
SA8	3	80.25	✓			
Adaptors to PVC pipes	**Nom**	**Grommet ID mm**				
SA9	4	106	✓			
SA10	6	157		✓		
ADRW Universal Rainwater Adaptor to round or square rainwater pipes up to 76mm			✓			
SC Sliding Coupling			✓	✓		
CI Adaptor to Cast Iron Pipes made to **BS 437**			✓	✓		
ST Stopper			✓	✓		

*Available on demand

Channel Pipe & Fittings, Plain end		mm	100	150	225	300
72P Pipe	Length m 0.3		✓	✓	*	
	0.6		✓	✓		
	1.0		✓	✓		

Accessories	mm
Pipe Cutters Available in two sizes	90 & 100mm 90, 100, 125 & 150mm
Available in two sizes	Up to 225mm 225 to 300mm
Available in two sizes	Up to 225mm 225 to 300mm

System Performance

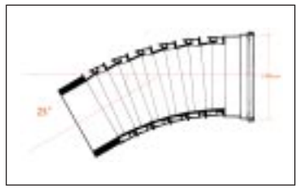
Standards

SuperSleve pipes are manufactured to a harmonised European Standard, **BS EN 295:**1991, which specifies requirements for vitrified clay pipes and fittings with flexible mechanical joints for drains and sewers.

Supersleve pipes are assessed by the Water Services Association of Australia (WSAA) appraisal No PA98/8 as fit for purpose and bear Standards Australia WaterMark IP088 - MP52 Spec 418.

Strength

Due to advanced manufacturing techniques developed by Hepworth, the SuperSleve system has a performance level well in excess of the criteria laid down in the standards and exceeds class 4, AS1741. (See Table 1).



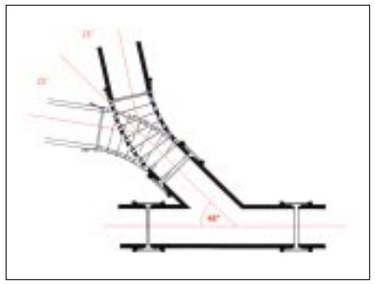
Quality Assurance

The SuperSleve system is manufactured under an ISO 9002, 1994 Quality System accepted by QAS. Where applicable, products conform to the relevant British and Australian Standards. Full details are available on request.

Table No. I

Crushing Strength (kN/m)

	Joint Type	BS EN 295: 1991	Bending Moment Resistance (kN/m)	Strength Class
SuperSleve 100	E	40	2.0	–
SuperSleve 150	E	40	5.0	–
SuperSleve 225	E	45	9.0	200
SuperSleve 300	E	72	–	240



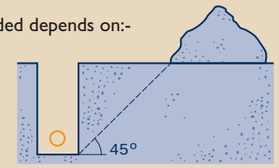
Sitework and Installation Instructions

Trench Preparation

The trench should not be excavated too far in advance of pipe laying and should be backfilled as soon as possible. Trench widths should be as narrow as practicable but not less than the pipe OD plus 300mm to enable proper compaction of sidefill. Trench sides should be correctly supported.

The type of bedding and filling needed depends on:-

- the pipe type and size
- the depth of pipe
- type of subsoil the surface
- the load on the surface
- width of trench (eg. under a road, field or garden)



Selected material and, where required, subsoil and topsoil should be put aside for backfilling at a later stage.

All excavated material should be placed 4 to 5 metres from the edge of the excavation or outside a 45° line drawn from the bottom of the trench.

If applicable, buried services such as gas, electricity and water should be uncovered with extreme care.

Trenches should be kept free from water, where possible, and the trench formation should be maintained free from disturbance due to foot traffic.

Jointing of small diameter pipes

Lubrication of pipe end before jointing

Pipes and fittings should be examined for damage and the joint surfaces and components cleaned immediately before laying.

For uncut straight pipes, or fittings which will stand vertically, place the component on a clean firm base, with the end to be jointed uppermost.

Clean off the outside surface of the pipe end and apply Hepworth Lubricant to this area.

Press the coupling on to the lubricated end, pushing down until the internal separating ring rests on the end of the pipe.

Assembling coupling to lubricated pipe end

When the drainage layout requires a link-up of fittings, this can be made up and jointed before laying.

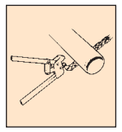
Assembling a set of fittings, before jointing to pipeline

Laying

Lay the first pipe with the coupling attached and facing the next pipe to be connected. Stake the first pipe temporarily for rigidity during the laying of the line.

Jointing SuperSleve

Attach a coupling to the next pipe, as described under 'Jointing', and clean and lubricate the other end. Push this into the coupling of the previously laid pipe, taking care to prevent soil or stones from getting into the joint.

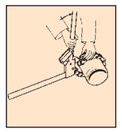


Position pipe on chain

Cutting

Use a Hepworth cutter to cut a pipe to the required work size.

Lay the pipe across the extended chain, aligning the required-length mark with the cutting wheels.



Engage chain on wheel

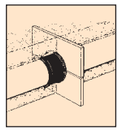
Position pipe on chain

Raise the upper handle of the cutter, wrap the chain round the pipe, and engage the jaw-hook.

Press the handle firmly downwards until the pipe is cut.

Engage chain on wheel Trimming

Remove the sharp edges of the cut using a course file or emery stone.



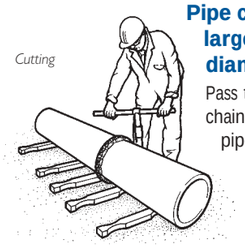
SuperSleve in concrete

Flexibility in concrete

In any circumstances where special conditions require the system to be laid in concrete bed or surround, the pipeline should not be allowed to become a rigid structure and the benefits of flexibility lost.

Flexible joints should be provided in the concrete as illustrated by inserting compressible board (fibreboard or polystyrene), at every joint, pre-cut to pipe diameter and to height and width equal to the concrete cross section.

A minimum board thickness of 18mm is used.



Cutting

Pipe cutting of large diameter pipe

Pass the cutter chain under the pipe, aligning the cutting wheels with the cut line on the pipe.

Hook the chain onto the jaw of the pipe cutter, tighten down to take up slack in the chain.

Then turn the cutter bar to tighten the chain and cut the pipe.

Remove the sharp edges of the cut using a coarse file or emery stone.

Fittings should not be cut.

Cleaning and lubricating

Pipe jointing

Check that the components are not damaged in any way that could result in an unsatisfactory joint.

Lower the pipe on slings into the trench.

Ensure that the inside of the coupling and the exterior of the spigot are clean. Spread a layer of lubricant over the pipe end to the required insertion depth and push the coupling home onto the pipe.

Lower the next pipe into the trench, inserting the pipe into the coupling previously laid.

Backfilling of trenches

In the first stages of backfill, selected material which contains no rocks should be placed uniformly on both sides of the pipe by hand in layers not exceeding 100mm in thickness, each layer being compacted by hand tamping until the pipe has a minimum of 150mm compacted cover.

Further backfill should be placed in layers not exceeding 300mm, each layer being well compacted.

Mechanical compaction equipment should not be used until there is a minimum of 450mm of compacted material above the crown of the pipe.

Protection of pipes laid at very shallow depths

Protection should be provided against loads other than final backfill and wheel loading or impact e.g. construction loads, erection of fences etc.

Pipes with less than 0.6mm of cover should be completely surrounded with 150mm thickness of in-situ concrete with provision for flexibility at pipe joints.

Industrial applications

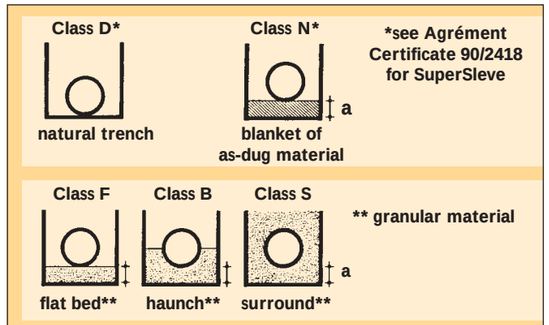
SuperSleve Clay Pipe and propylene couplers are highly resistant to heat and most chemicals used in industrial applications. For technical advce regarding this matter contact Hepworth.

Testing

Before any backfilling takes place, testing should be carried out in accordance with the recommendations set out in 'Water and Air Testing of Drains and Sewers', and (available from Hepworth on request) 'Testing of Drains and Sewers - Notes for the guidance of the field operative', both published by the Clay Pipe Development Association.

Additional technical information is available from the Clay Pipe Development Association.

Subsoil Conditions and Bedding Classes



Extract from Table 12 in Approved Document A1/2 of The Building Regulations 1992

Type of subsoil	Conditions of subsoil	Field test applicable
III and Clay other	Stiff	Cannot be moulded with the fingers, requires a pick or pneumatic or mechanically-operated spade for its removal
Sandy clay	Stiff	
IV Clay	Firm	Can be moulded by substantial pressure with the fingers and can be excavated with graft or spade
Sandy clay	Firm	
V Sand	Loose	Can be excavated with a spade. Wooden peg 50mm square in cross-section can be easily driven
Silty sand	Loose	
Clayey sand	Loose	
VI Silt	Soft	Fairly easily moulded in the fingers and readily excavated
Clay	Soft	
Sandy clay	Soft	
Silty clay	Soft	

Pipe Bedding Materials

Nominal bore of pipe mm	Size of material mm	
	Single sized	Graded
100	10	–
150	10 or 14	14 to 5
225	10, 14 or 20	14 to 5 or 20 to 5
300	10, 14 or 20	14 to 5 or 20 to 5

Class D (Bedding factor 1.1)

If the sub-soil falls within types III to VI in Table E1 in Approved Document A1/2 of The Building Regulations 1992, the relevant part of which is reproduced above, hand-trim the trench bottom with a spade to support the pipe along the length of its base, allowing for any socket recesses.

Class N (Bedding factor 1.1)

Where the subsoil cannot be trimmed accurately, excavate the trench to a depth of at least 50mm below the pipe barrel for SuperSleve/EuroTop, increasing this in rocky ground to 150mm. Form a bed for the pipe from as-dug, if suitable, or granular material, well compacted and covering the full trench width. BS 8301:1985, Section 11 gives details of materials suitability. The pipe barrel should be rested firmly on its bedding. Any granular material used should be packed by slicing with a spade.

Class F (Bedding factor 1.9)

Recommended for maximum installed cost savings.

Class B (Bedding factor 2.5), Class S (Bedding factor 2.5)

The bedding factors listed above are limited to use with clay pipes only. This provides the benefit of savings in excavation, removal from site and imported material, especially when compared with flexible pipes which require a full granular surround.

Recommended Bedding Requirements

Bedding Requirements

At shallow depths, the depth of cover used for design purposes should be that which will apply during site construction. This may be less than the finished level.

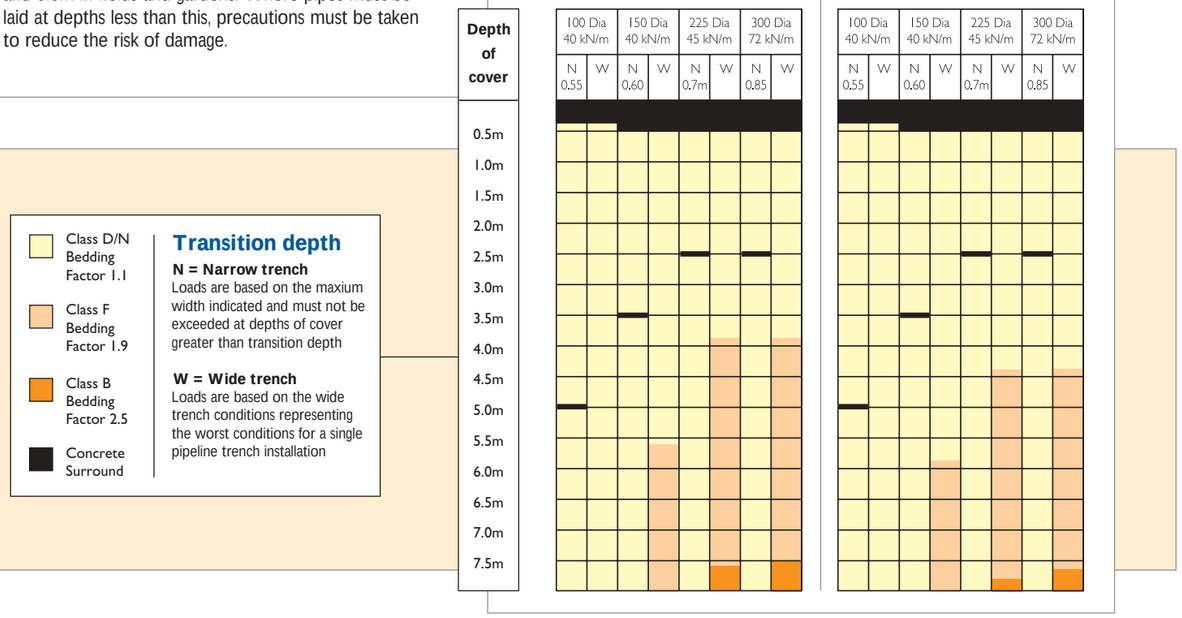
The minimum depths of cover are 1.2m under roads and 0.6m in fields and gardens. Where pipes must be laid at depths less than this, precautions must be taken to reduce the risk of damage.

Main Roads

Full loads (soil): 2000 Kg/m2
Vehicle loads: 8 wheels, 112.5 kN each including impact factor

Fields & Gardens

Full loads (soil): 2000 Kg/m2
Vehicle loads: 2 wheels, 30 kN each; impact factor 2.0



Hydraulic Design Equations

The most generally accepted equation currently in use is that attributed to Colebrook and White. In this equation, the velocity of flow is related to the pipe bore, the kinematic viscosity of the liquid, the gradient, and hydraulic roughness of the pipeline. **BS 8005:** Part 1: 1987 'Sewerage' Table No. 4 specific roughness values for various pipe materials. When a pipe is conveying sewage or a combination of sewage and surface water, slime, mostly micro-biological, adheres to and grows on the interior surface. This layer of slime is the major influence on the hydraulic roughness of pipelines and modifies the effect of various surface textures.

The Colebrook-White Equation

The charts on the following pages are based on the Colebrook-White equation for transitional flow, the general form of which is:

$$\frac{1}{\sqrt{I}} = -2 \log \left[\frac{k_s}{3.75} + \frac{2.5}{Re\sqrt{I}} \right]$$

the equation, when expressed in engineering terms, becomes:

$$V = -2\sqrt{(2g\,Di)} \log \left[\frac{k_s}{3.7D} + \frac{2.51v}{D\sqrt{2g\,Di}} \right]$$

where

I = friction coefficient, $\frac{2g\,Di}{V^2}$

V = Discharge velocity (m/s)

g = Gravitational acceleration (9.81 m/sec^2)

i = Hydraulic gradient

v = Kinematic viscosity of fluid (m^2/sec) at 10°C (1.31 x 10^{-6} m^2/sec)

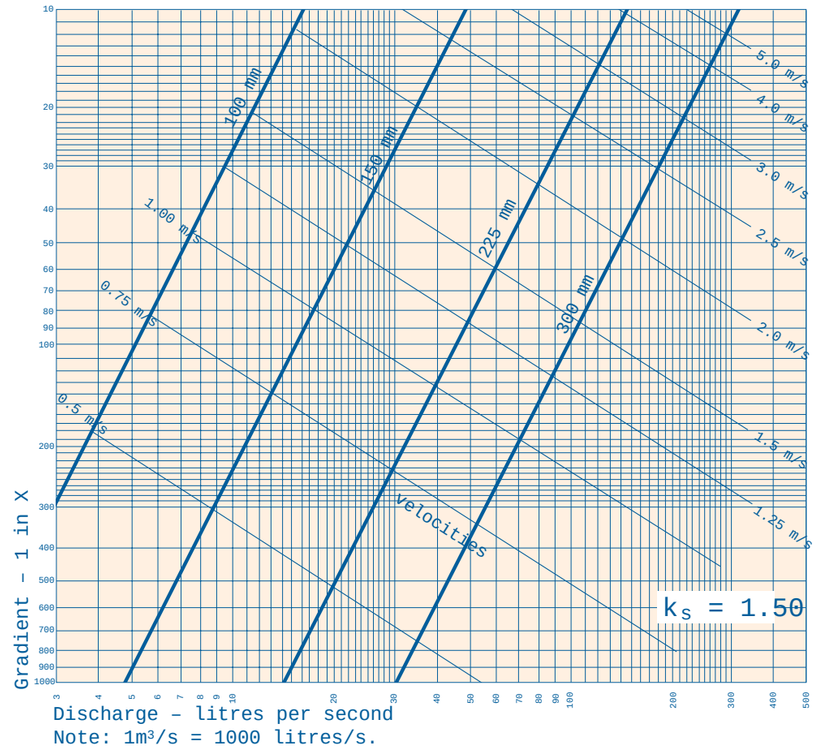
k_S = Linear measure of effective roughness (0.6 or 1.5mm)

D = Nominal internal diameter of pipe (100 to 600mm)

Re = Reynolds number, $\frac{VD}{v}$

The charts developed from this equation may be used to determine the average velocity of flow and the discharge for pipes with an effective roughness (k_S) of 0.6mm for surface water sewers and combined sewers. The values of these are specified for use in the Water Services Association's publication 'Sewers for Adoption' 3rd Edition.

Hydraulic Design Data/Discharge Flowchart - ks = 1.50



Hydraulic Design Data/Discharge Flowchart - ks = 0.60