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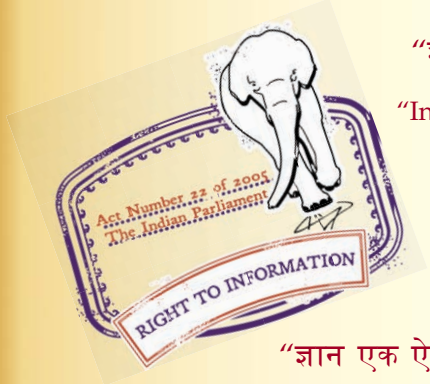

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"Knowledge is such a treasure which cannot be stolen"

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IS : 3042 - 1965
(Reaffirmed 2003)

Indian Standard

SPECIFICATION FOR SINGLE FACED SLUICE GATES (200 to 1 200 mm Size)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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(Reaffirmed 1993)

Indian Standard

SPECIFICATION FOR SINGLE FACED SLUICE GATES (200 to 1 200 mm Size)

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Indian Standard

SPECIFICATION FOR SINGLE FACED SLUICE GATES (200 to 1200 mm Size)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 January 1965, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Single faced sluice gates are extensively used in water supply and drainage works for controlling the flow. The users do not have, at present, any standards on which they can base their requirements. This standard which is intended to fulfil the need, gives the dimensions, materials and constructional requirements for different classes of single faced sluice gates from 200 to 1 200 mm sizes.

0.3 In the preparation of this specification the large variety of sluice gates manufactured in the country has been taken into account and effort has been made to reduce the variety. Only those dimensions and types of manufacture which are commonly used in the country have been specified.

0.4 The Committee recognises that improvements in design and manufacture may lead to development of sluices having dimensions different from those given in this standard. But it is felt that at present this specification should indicate at least the principal dimensions — those of the waterway and the sluice frames — and the principal types to assist the manufacturer and the user.

0.5 There may be instances where the unbalanced force tends to push the door away from the frame. In such cases the guide strips will bend and cause leak past the sealing face. This may be overcome by using a more robust design construction and introduction of additional wedging elements. For these reasons sluices for operating forces tending to push the door away from the frame are considered non-standard and are outside the scope of this specification. It is felt that by a judicious selection of the location of the frame, duty conditions, in most cases, could be reduced to water pressure tending to push the door on to frame and thereby within the purview of this standard.

0.6 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

0.7 A list of information to be supplied with enquiry and order by the purchaser is given in Appendix A.

0.8 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This specification covers single faced sluices from 200 to 1 200 mm sizes of different shapes with rising (sliding) and non-rising (rotating) spindles.

1.2 The specification is limited to sluices which are suitable for general use only and for the following types of special uses:

a) For wall mounting in situations where small and medium volumes of raw or filtered water, storm water or sewage are to be controlled and a single faced seal is required on the waterway for isolating purposes;

b) For water supply draw-off and purification works, sewage plants, ordinary land drainage and irrigation canals, hydro-electric collecting aqueducts and tailraces;

c) For unbalanced head restricted to 15 m, tending to push the door on to the frame and thereby helping stanch leakage past the sealing face; and

d) For manual operation by handwheel/tee-key/frame or floor mounting headstocks with or without gearing.

1.3 The designs given in the standard may be adopted to electric, hydraulic or pneumatic power operation to suit specific duty provided operating conditions are within the stated limitations and are not at variance with those already specified.

1.4 The standard does not lay down requirements for actuating gear which is left to the mutual agreement between purchaser and manufacturer.

1.5 This standard does not cover the types of sluices where the operating forces tend to push the door away from the frame.

*Rules for rounding off numerical values (*revised*).

2. CLASSIFICATION

2.1 Single faced sluices shall be of two classes, namely, Class 1 and Class 2.

2.2 Class 1 sluices shall be suitable for a maximum seating unbalanced head of 6 m of water.

2.3 Class 2 sluices shall be suitable for a maximum seating unbalanced head of 15 m of water.

3. SHAPES AND TYPES

3.1 Shapes — Sluices may be circular, square or rectangular in shape.

3.2 Types — Sluices may be manufactured either with rising or non-rising spindle.

4. NOMINAL SIZES AND DIMENSIONS

4.1 Single faced sluices shall be manufactured according to the nominal sizes and dimensions as given in Table 1.

NOTE — Tolerances on the dimensions have not been specified at the present stage and it is expected that manufacturers will work as close to the nominal values as possible.

TABLE 1 NOMINAL SIZES AND DIMENSIONS OF SINGLE FACED SLUICES

SHAPE	SIZE	REF. TO FIG.
(1)	(2)	(3)
	mm	
Circular	200 to 600	1A, 2A
	200 to 1 200	3A, 4A
Square	200 to 600	1B, 2B
	200 to 1 200	3B, 4B
Rectangular	300 × 375 to 1 200 × 1 050	5

4.1.1 *Range and Ratings of Different Types* — The range and ratings of different types with rising and non-rising spindles are given in Table 2.

TABLE 2 RANGE AND RATINGS OF SLUICES

Class	Spindle Type	Size	Water Pressure (Seating) in m Head *Max*	Reference to Fig.
(1)	(2)	(3)	(4)	(5)
		mm		
1	Rising	200 to 300	6	1A and 1B
		350 and 450	4·5	
		500 to 600	3	
1	Non-rising	200 to 300	6	2A and 2B
		350 and 450	4·5	
		500 to 600	3	
2	Rising	200 to 1 200	15	3A and 3B
2	Non-rising	200 to 1 200	15	4A and 4B
2	Rising	300 × 375 to 1 050 × 1 200	15	5

5. MATERIALS

5.1 Cast Iron — Cast iron used for frame and door shall be of a quality not less than Grade 20 of IS : 210-1962*.

5.2 Mild Steel — Spindles, bolts and nuts shall be of mild steel which shall conform to IS : 226-1962†.

5.3 Gunmetal — Leaded gunmetal shall be used for face and seat rings/trim and spindle nuts. It shall have a tensile strength of 22 kg/sq mm and elongation of not less than 12 percent on a gauge length of 5 cm when tested in accordance with IS : 2654-1964‡. The minimum hardness shall be 65 HB when tested with a 10 mm diameter ball and a load of 1 000 kg when applied for 15 seconds.

*Specification for grey iron castings (*revised*). (Since revised).

†Specification for structural steel (standard quality) (*third revision*). (Since revised).

‡Method for tensile testing of copper and copper alloys.

6. MANUFACTURE AND WORKMANSHIP

6.1 Frame

6.1.1 Frames shall be of unit construction and shall be so designed as to withstand the pressures specified in **2.2** and **2.3**.

6.1.2 Frames shall have a robust spigot of an appropriate length, cast integral at the back for ease of support in the waterway and to provide an effective seal. Sluices having circular waterway may have a spigot dimensions conforming to IS : 1538-1960*. For square and rectangular openings the dimensions shall be as agreed to between the purchaser and manufacturer to suit specific duty.

6.1.3 The back of the frame shall be flat.

6.1.4 The frame for non-rising spindle sluices shall have a machined face on the top to support the thrust plate.

6.1.5 A cast iron side guide strip having a machined taper face on the underside shall be fixed to the frame on each side by mild steel studs and extending over the height of the waterway to provide effective guide throughout the travel of the door.

6.1.6 A stopper shall be cast integral immediately below the waterway and central with it to limit the travel of the door.

6.2 Door

6.2.1 Door shall have reinforcement ribs cast integral at the back for strength. On each side there shall be tapered snugs or gunmetal or bronze tape strips not less than three, machined to match similar taper faced side guide strips on the frame.

6.2.2 Two integrally cast lugs drilled to take a mild steel bearing pin shall be provided on doors for use with rising spindles. Integrally cast pocket suitably reinforced to accommodate a nut shall be provided on doors with non-rising spindles.

6.2.3 A stopper to match that on the frame shall be cast integrally at the bottom.

6.3 Face (Door) and Seat (Frame) Rings

6.3.1 Facings for different types of sluices shall conform to the dimensions given in Tables 3 to 7 read with Fig. 1 to 5, respectively.

6.3.2 Facings shall be so secured by brass rivet pins in the machined grooves of the frame and door and machined and hand finished, that with the door fully shut a satisfactory water tight seal is formed on the waterway. The contact between the facings shall be sufficiently close at every point in their perimeter so as to produce a uniform bearing all round.

*Specification for cast iron fittings for pressure pipes for water, gas and sewage. (Since revised).

6.3.3 The attachment of the facings to the frame and door shall be so carried out that when finished they shall remain in place free from distortion or loosening during effective life of the sluice.

6.3.4 For sluices up to 300 mm diameter and under, the face rings may be of 'L' section, pressed in and for sizes over 300 mm, rings of only rectangular section shall be used.

Seat rings for sluices up to 300 mm diameter may have a 'L' section, pressed in and for sizes beyond 300 mm diameter, shall have strips/rings of rectangular section.

6.4 Guides — Guides shall be adequately secured to the main frame by stud bolts and provision shall be made for appropriate longitudinal movement to adjust degree of wedging consistent with sealing property. There shall be little lateral movement and tongues, keys, shoulders or lugs may be provided for the purpose.

6.5 Spindles

6.5.1 *Rising/Sliding Type* — The dimensions shall conform to those specified in Tables 3, 5 and 7 and shall terminate at the top of the sluice door and operated through either frame or floor mounted headstock. The threaded portion of the spindle shall be completely clear of the liquid being handled and shall be accessible for lubrication.

6.5.2 *Non-rising Rotating Type* — These shall conform to the dimensions given in Tables 4 and 6, and shall be threaded at the bottom. They shall be restrained axially by a thrust plate on the top of the sluice frame and shall work in a nut located in a pocket on the top centre of the door.

6.5.3 The screwed portions of the spindles shall have machine cut square or acme thread.

6.5.4 As the length of rod may vary for each installation, the number of couplings (for both tensional and torsional types) required may be computed from the details given in Table 8.

6.5.5 For lengths exceeding six metres, it is recommended that only sliding rods be employed. If, however, prevailing conditions do not permit their use the rotating type may be considered.

6.5.6 The design of the couplings, tensional/torsional, shall be a matter for agreement between the purchaser and manufacturer.

6.6 Wall Guide Brackets

6.6.1 *Tensional Types* — For extension rods over two metres in length guide brackets are necessary to provide support during the entire travel of the door. The number required may be obtained from Table 9.

6.6.2 *Torsional Types* — The number of brackets shall be the same as the number of couplings as given in Table 8.

6.7 Thrust Bearings — For non-rising spindles, bearings shall be provided in the yoke of the frame of a design that will develop and safely transmit the full thrust at the time of opening or closing the door. Ball or roller bearings of an approved design may be provided if considered necessary to improve efficiency.

6.8 Operating Mechanism — Provision may be made for operation of sluices by hand, electric, hydraulic or pneumatic power.

6.8.1 *Hand Wheels* — For gates having rising or non-rising spindles the diameter of handwheel is dependent on the following factors:

a) Maximum unbalanced head;

b) Nature of actuating gear employed — spur, mitre bevel or worm; and

c) Length of operating rod.

The diameters of handwheels suitable for use on ungeared headstocks are given in Table 10 for general guidance.

6.9 Heights of the Sluices — The overall heights and the dimensions of the sluice frame and doors shall be in accordance with Table 11.

6.10 Workmanship — All casting shall be clean, sound and without defect of any kind. They shall be free from sand and no casting shall be burned, plugged, stopped, patched or welded and no repairs of defects shall be permissible.

All foundry and machine work shall be done in accordance with best modern practice and all component parts shall be carefully and accurately machined to jigs and templates so as to make them fully interchangeable on site without any additional work.

7. PAINTING

7.1 Immediately after casting and before machining, all cast iron parts shall be thoroughly cleaned and before rusting commences, these shall be coated

by at least two coats of bitumastic rust-proof compound of satisfactory quality specification. The final coat or coats shall be applied to the exterior surfaces, excluding machined portions, after assembly and testing.

8. TESTING

8.1 After completion each sluice gate shall be tested in the shop for smooth working of the component parts including the operating gear.

APPENDIX A
(*Clause* 0.7)

INFORMATION TO BE SUPPLIED WITH ENQUIRY AND ORDER

A-1. The following information shall be supplied with enquiry and order:

a) Type of wall mounting, open channel* or dry well*;

b) Shape of waterway, round, square or rectangular;

c) Size — if rectangular, width × depth;

d) Rising or non-rising spindle;

e) Fluid flowing—fresh or raw water, sewage, etc;

f) Maximum unbalanced head;

g) Working pressure;

h) Method of operation — hand, with gear/electric/hydraulic or pneumatic; if one or the other of the last three particulars of supplies, motive water/air pressures available;

j) Distance between centreline of waterway to base of operating platform;

k) Centreline of spindle to face of wall; and

m) Refinements if any, such as gate travel indicators on headstocks.

*Not recommended.

TABLE 3 DIMENSIONS OF FACINGS AND SPINDLE DIAMETERS FOR CIRCULAR AND SQUARE SINGLE FACED SLUICES

(*Clauses* 6.3.1, 6.5.1 and *Fig.* 1)

(All dimensions in millimetres)

Waterway Circular or Square	Face Thickness		Face Breadth		Spindle Rising Diameter	
	X	*Y*	*X*	*Y*	*X*	*Y*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
200	4	5	16	16	30	30
250	4	5	20	20	30	40
300	5	5	20	20	40	40
350	6	6	20	20	40	40
450	6	6	20	20	45	48
500	6	6	22	22	45	50
550	6	6	22	22	50	50
600	6	6	22	22	50	55

X = Circular waterway.
Y = Square waterway.

TABLE 4 DIMENSIONS OF FACINGS, SPINDLE DIAMETERS AND DIMENSIONS OF TAPERED SQUARES ON SPINDLES FOR CIRCULAR AND SQUARE SINGLE FACED SLUICES

(*Clauses* 6.3.1, 6.5.2 and *Fig.* 2)

(All dimensions in millimetres)

Waterway Circular or Square	Face Thickness		Face Breadth		Diameter	Tapered Square on Spindle Non-rising		
	X	*Y*	*X*	*Y*		Top Square	Bottom Square	Length
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
200	4	5	16	16	35	22	27	50
250	4	5	20	20	35	22	27	50
300	4	5	20	20	35	22	27	50
350	6	6	20	20	45	24	29	50
450	6	6	20	20	45	24	29	50
500	6	6	22	22	50	29	29	65
550	6	6	22	22	50	29	29	65
600	6	6	22	22	50	29	29	65

X = Circular waterway.
Y = Square waterway.

TABLE 5 DIMENSIONS OF FACINGS AND SPINDLE DIAMETERS FOR CIRCULAR AND SQUARE SINGLE FACED SLUICES

(*Clauses* 6.3.1, 6.5.1 and *Fig.* 3)

(All dimensions in millimetres)

Waterway Circular or Square	Face Thickness		Face Breadth		Spindle Rising Diameter	
	X	*Y*	*X*	*Y*	*X*	*Y*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
200	4	5	20	20	32	32
250	4	6	20	25	32	40
300	6	6	25	25	40	40
450	6	6	25	25	45	48
600	6	6	25	25	50	55
750	6	6	25	25	55	58
825	6	6	25	25	58	58
900	6	6	25	25	58	60
1 050	6	6	32	32	60	65
1 200	6	6	32	32	65	65

X = Circular waterway.

Y = Square waterway.

TABLE 6 DIMENSIONS OF FACINGS, SPINDLE DIAMETERS AND DIMENSIONS OF TAPERED SQUARES ON SPINDLES FOR CIRCULAR AND SQUARE SINGLE FACED SLUICES (NON-RISING TYPE)

(*Clauses* 6.3.1, 6.5.2 and *Fig.* 4)

(All dimensions in millimetres)

Waterway Circular or Square	Face Thickness		Face Breadth		Spindle Diameter	Tapered Square on Spindle Non-rising		
	X	*Y*	*X*	*Y*		Top Square	Bottom Square	Length
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
200	4	5	20	20	35	22	27	50
250	4	6	20	25	40	22	27	50
300	6	6	25	25	40	22	27	50
450	6	6	25	25	50	35	42	67
600	6	6	25	25	58	35	42	67
750	6	6	25	25	58	35	42	67
825	6	6	25	25	58	35	42	67
900	6	6	25	25	58	35	42	67
1 050	6	6	32	32	65	40	46	75
1 200	6	6	32	32	65	40	46	75

X = Circular waterway.

Y = Square waterway.

TABLE 7 DIMENSIONS OF FACINGS AND SPINDLE DIAMETERS FOR RECTANGULAR SINGLE FACED SLUICES

(*Clauses* 6.3.1, 6.5.1 and *Fig.* 5)

(All dimensions in millimetres)

WATERWAY Width (A_1) × Depth (A_2)	FACE THICKNESS	FACE BREADTH	SPINDLE RISING DIA
(1)	(2)	(3)	(4)
300 × 375	6	25	40
450 × 300	6	25	45
375 × 450	6	25	47
525 × 375	6	25	47
450 × 525	6	25	50
600 × 450	6	25	50
525 × 600	6	25	53
675 × 525	6	25	53
600 × 675	6	25	53
750 × 600	6	25	53
675 × 750	6	25	55
825 × 675	6	25	55
750 × 825	6	25	55
900 × 750	6	25	60
825 × 900	6	25	60
1 050 × 900	6	30	62
900 × 1 200	6	30	62
1 200 × 900	6	30	62
1 050 × 1 200	6	30	62
1 200 × 1 050	6	30	62

TABLE 8 CLASS 1 AND CLASS 2 SLUICES — COUPLINGS FOR RISING AND NON-RISING SPINDLES AND WALL BRACKETS FOR NON-RISING SPINDLES

(*Clauses* 6.5.4 *and* 6.6.2)

Distance Below Base of Headstock	Couplings
m	No.
Up to 3·5	0
Over 3·5 to 8	1
Over 8 „ 12·5	2
Over 12·5 „ 17	3
Over 17 „ 21·5	4
Over 21·5 „ 26	5
Over 26 „ 30·5	6

NOTE — Where the length of rod below base of headstock exceeds 3·5 m, one coupling is required and for every 4·5 m thereafter, an additional coupling. The table is intended to facilitate calculation.

TABLE 9 WALL GUIDE BRACKETS FOR TENSIONAL RODS

(*Clause* 6.6.1)

Distance of Rod Below Base of Headstock	Brackets
m	No.
Up to 2	Nil
Over 2 to 3·5	1
Over 3·5 „ 6·5	2
Over 6·5 „ 9.5	3
Over 9·5 „ 12·5	4
Over 12·5 „ 15·5	5
Over 15·5 „ 18·5	6
Over 18·5 „ 21·5	7
Over 21·5 „ 24·5	8
Over 24·5 „ 27·5	9
Over 27·5 „ 30	10

NOTE — Wall guide brackets are required for torsional rods at a maximum of 4·5 m centres, and for tensional rods at a maximum of 3 m centres, the distance to the topmost guide bracket not exceeding 4 m and 2 m respectively below base of headstock. However, for tensional rods more than 3 m in length, the distance of the topmost guide bracket below the headstock base is generally reduced to one foot, and the rod and bracket are arranged to eliminate torsional strain in the rod.

TABLE 10 DIAMETERS OF HANDWHEELS FOR USE ON UNGEARED HEADSTOCKS AND DETAILS OF LENGTHENING RODS

(*Clause* 6.8.1)

(All dimensions in millimetres)

WATERWAY	CLASS 1 (FIG. 1 AND 2)			CLASS 2 (FIG. 3, 4 AND 5)		
	Type of Spindle Used	H/W Dia	Rod Dia	Type of Spindle Used	H/W Dia	Rod Dia
(1)	(2)	(3)	(4)	(5)	(6)	(7)
200 Dia	NR	375	30	NR	375	30
	R	225	28	R	225	30
200 Square	NR	375	35	NR	375	35
	R	225	28	R	225	35
250 Dia	NR	375	35	NR	375	35
	R	225	28	R	225	30
250 Square	NR	450	38	NR	600	38
	R	375	38	R	375	38
300 Dia, 300 × 375 Rectangular	NR	450	38	NR	600	38
	R	375	38	R	375	38
300 Square	NR	600	40	NR	750	40
	R	375	38	R	450	38
350 Dia	NR	600	40	NR	750	40
	R	375	38	R	450	38
350 Square	NR	600	45	—	—	—
	R	375	38	R	525	38
450 Dia, 375 × 450 Rectangular	NR	750	47	NR	—	—
	R	450	45	R	675	45
450 Square	NR	750	47	—	—	—
	R	450	45	R	525	45
500 Dia, 525 × 375 Rectangular	NR	750	47	—	—	—
	R	450	45	R	525	45
500 Square	R	600	45	R	750	45

(*Continued*)

TABLE 10 DIAMETERS OF HANDWHEELS FOR USE ON UNGEARED HEADSTOCKS AND DETAILS OF LENGTHENING RODS

WATERWAY	CLASS 1 (FIG. 1 AND 2)			CLASS 2 (FIG. 3, 4 AND 5)		
	Type of Spindle Used	H/W Dia	Rod Dia	Type of Spindle Used	H/W Dia	Rod Dia
(1)	(2)	(3)	(4)	(5)	(6)	(7)
550 Dia, 450 × 525 Rectangular	NR	750	50	—	—	—
	R	525	45	R	600	45
550 Square	R	750	—	R	900	—
600 Dia, 600 × 450 Rectangular	R	600	45	R	750	45
600 Square	R	750	50	Ungeared headstocks cannot be used		
650 Dia, 600 × 525 Rectangular, 675 × 525 Rectangular	R	750	50	R	900	50
650 Square, 600 × 675 Rectangular	R	750	50	Ungeared headstocks cannot be used		
700 Dia	R	750	50	-do-		
700 Square	R	750	50	-do-		
750 Dia, 750 × 600 Rectangular, 675 × 750 Rectangular	R	750	50	-do-		
825 Dia, 750 Square, 825 × 675 Rectangular	R	900	50	-do-		

NR = Non-rising R = Rising H/W = Hand wheel

NOTE — Ungeared headstock will not be suitable for higher sizes.

TABLE 11 HEIGHTS OF SINGLE FACED SLUICES

(*Clause* 6.9)

(All dimensions in millimetres)

a) CLASS I FOR A MAXIMUM SEATING UNBALANCED PRESSURE OF 6 m HEAD

SIZE OF WATERWAY	HEIGHT OF FRAME
Figure 1A or 1B Rising Types	
200	615
250	720
300	845
350	1 010
450	1 210
500	1 350
550	1 450
600	1 550
Figure 2A or 2B Non-rising Types	
200	730
250	835
300	960
350	1 120
450	1 315
500	1 475
550	1 580
600	1 675

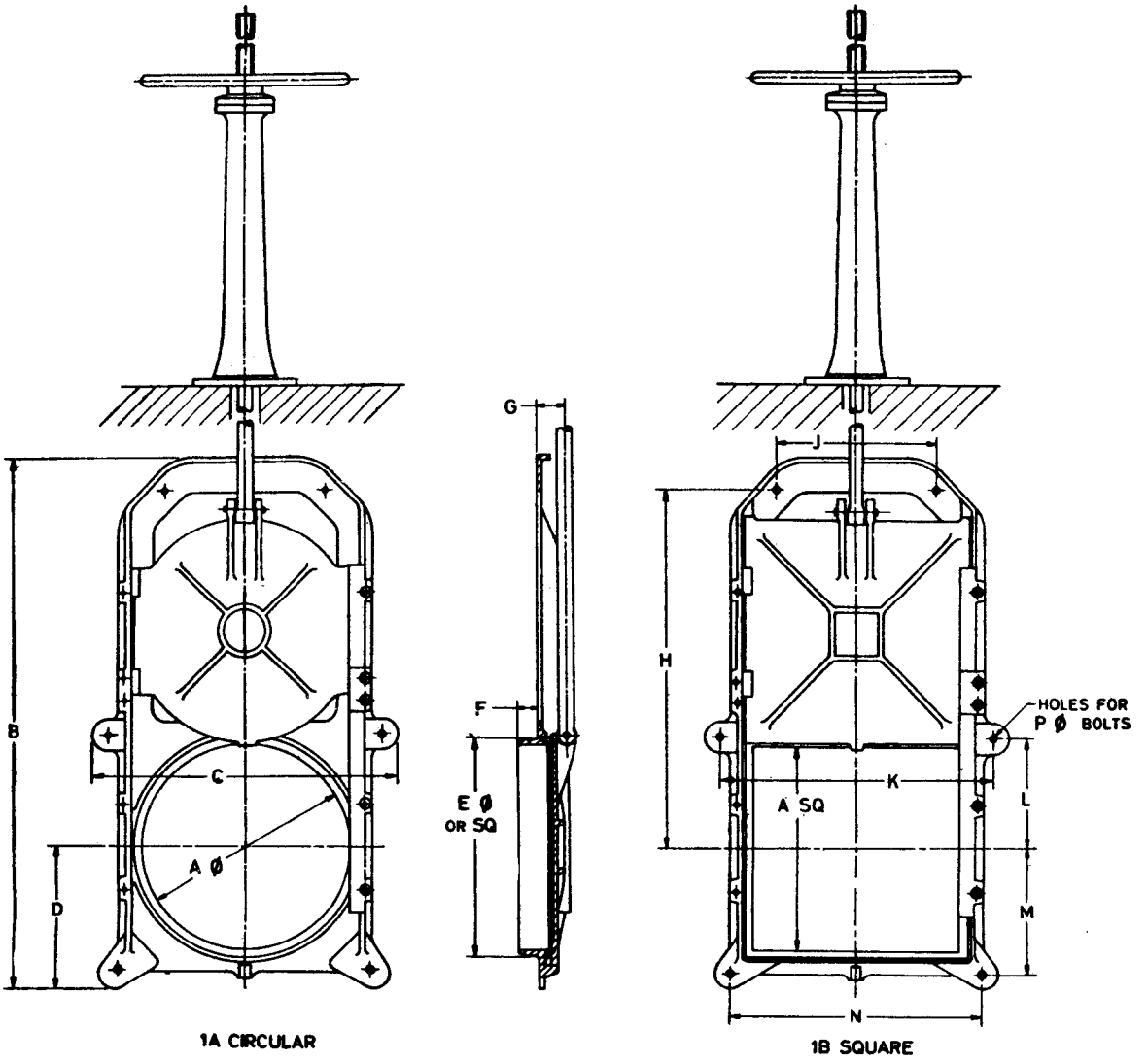
(*Continued*)

TABLE 11 HEIGHTS OF SINGLE FACED SLUICES — *Contd*

b) CLASS 2 FOR A MAXIMUM SEATING UNBALANCED PRESSURE OF 15 m HEAD

SIZE OF WATERWAY	FIG. 3A OR 3B RISING TYPES, HEIGHT OF TOP OF FRAME FROM INVERT	FIG. 4A OR 4B NON-RISING TYPES, HEIGHT OF FRAME
200	700	700
250	700	700
300	800	800
450	1 130	1 130
600	1 445	1 445
750	1 765	1 765
825	1 920	1 920
900	2 070	2 070
1 050	2 425	2 565
1 200	2 715	2 880

SIZE OF WATERWAY WIDTH × DEPTH	HEIGHT OF FRAME
Figure 5 Rising Type	
300 × 375	975
450 × 300	800
375 × 450	1 130
525 × 375	975
450 × 525	1 280
600 × 450	1 130
525 × 600	1 445
675 × 525	1 280
600 × 675	1 600
750 × 600	1 450
675 × 750	1 765
825 × 675	1 600
750 × 825	1 920
900 × 750	1 765
825 × 900	2 070
1 050 × 900	2 070
900 × 1 050	2 450
1 200 × 900	2 070
900 × 1 200	2 715
1 200 × 1 050	2 450
1 050 × 1 200	2 715



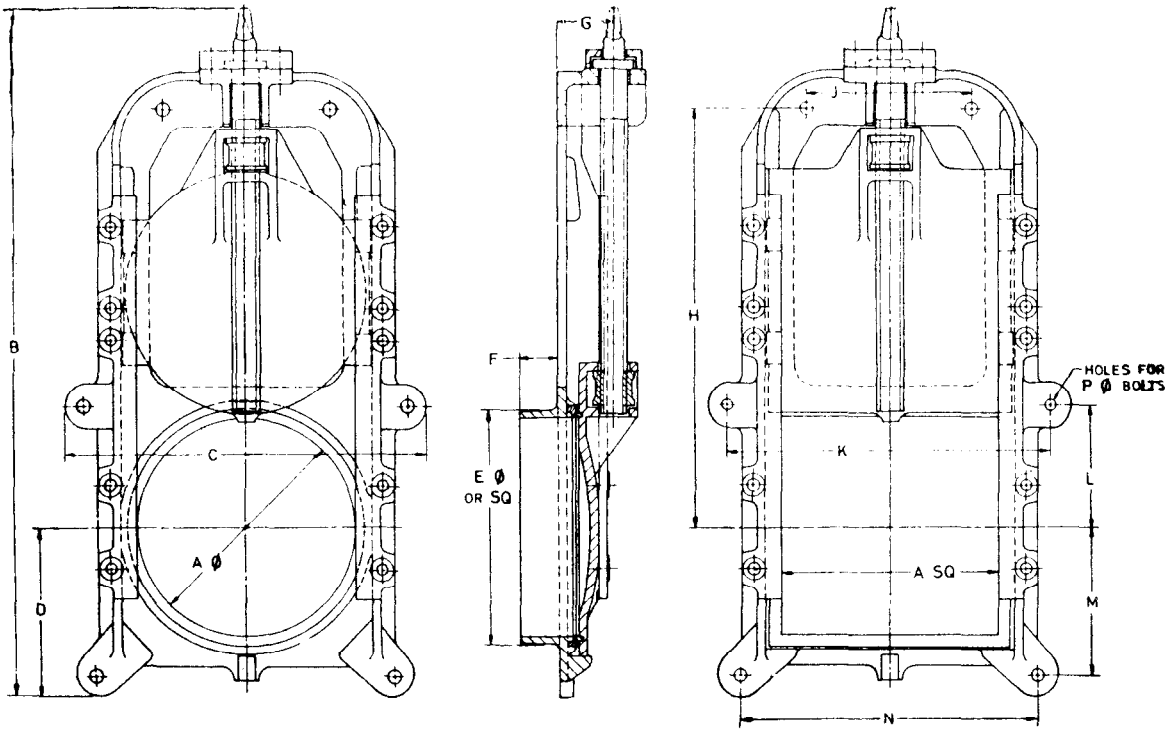
1A CIRCULAR

1B SQUARE

A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*J*	*K*	*L*	*M*	*N*	*P*
200	615	360	160	225	50	50	400	205	320	120	140	320	15
250	720	410	185	275	50	50	480	215	370	140	165	375	15
300	845	480	230	325	50	65	555	240	430	165	195	395	15
350	1 010	595	275	385	65	75	680	275	530	195	245	495	20
450	1 210	685	315	485	65	75	800	330	620	250	280	565	20
500	1 350	755	350	535	65	80	895	380	685	280	310	630	20
550	1 450	805	375	585	65	80	975	405	735	305	335	680	20
600	1 550	875	400	640	65	80	1 050	465	795	330	360	735	22

(All dimensions in millimetres)

FIG. 1 DIMENSIONS OF SINGLE FACED SLUICES 200 mm TO 600 mm (RISING TYPE)



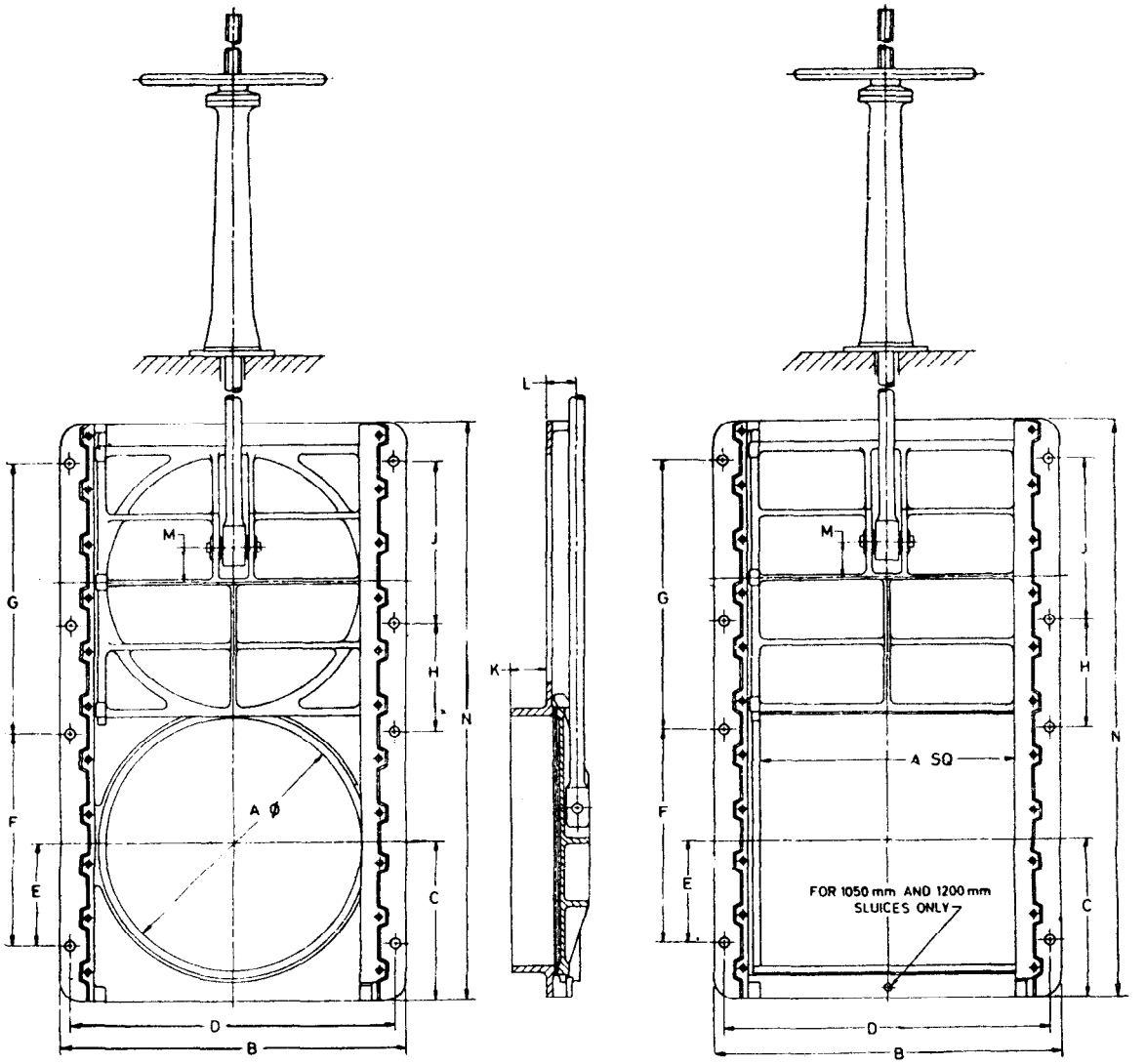
2A CIRCULAR

2B SQUARE

A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*J*	*K*	*L*	*M*	*N*	*P*
200	730	360	160	225	50	65	400	205	320	120	140	320	15
250	835	410	185	275	50	65	480	215	370	140	165	375	15
300	960	480	230	325	50	65	555	240	430	165	195	395	15
350	1 120	595	275	385	65	80	680	275	530	195	245	495	20
450	1 315	685	315	485	65	80	800	330	620	250	280	565	20
500	1 475	755	350	535	65	100	895	380	685	280	310	630	20
550	1 575	805	375	585	65	100	975	405	735	305	335	680	20
600	1 675	875	400	640	65	105	1 050	465	795	330	360	735	22

(All dimensions in millimetres)

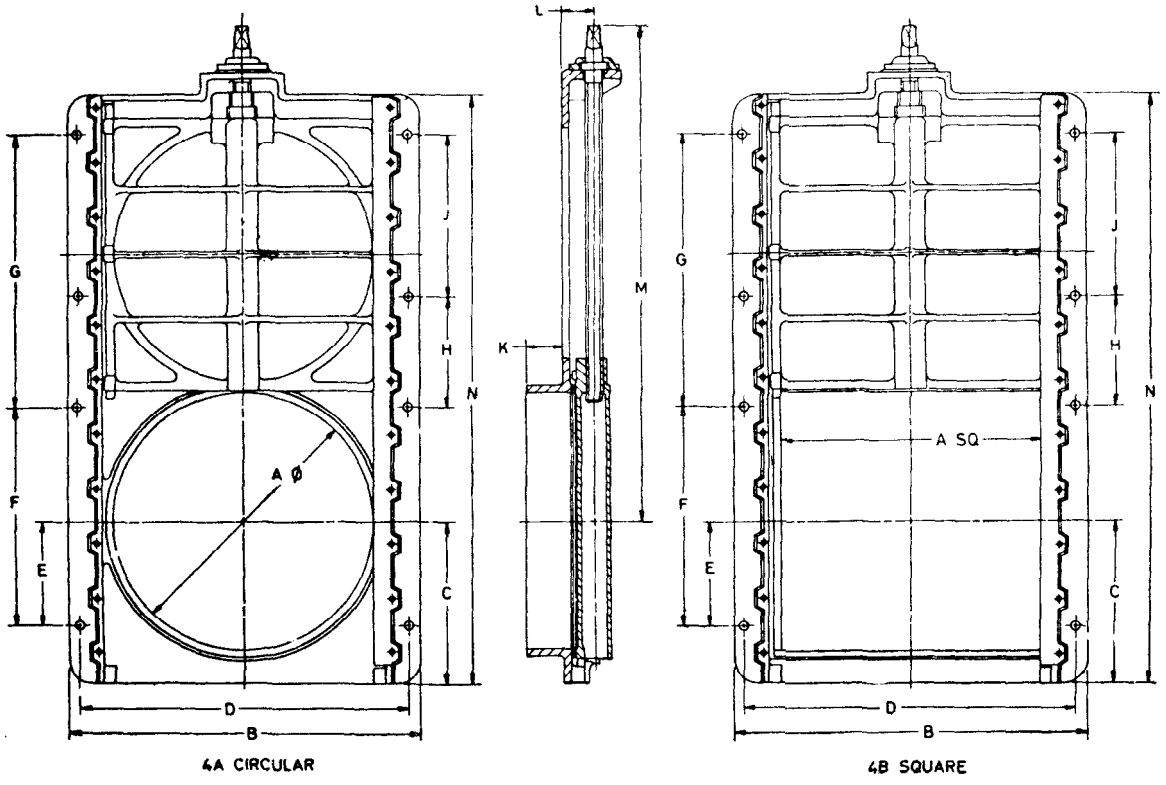
FIG. 2 DIMENSIONS OF SINGLE FACED SLUICES 200 *mm* TO 600 *mm*
(NON-RISING TYPE)



A	B	C	D	E	F	G	H	J	K	L	M	N	Binding Bolts No.	Binding Bolts dia.
200	465	215	415	70	420	—	—	—	85	95	—	700	4	20
250	465	215	415	70	420	—	—	—	85	95	—	700	4	20
300	515	240	465	85	475	—	—	—	85	95	—	800	4	20
450	710	325	660	145	380	380	—	—	85	95	—	1 130	6	22
600	890	405	825	240	535	535	—	—	85	95	—	1 445	6	24
750	1 065	490	990	305	710	710	—	—	115	100	95	1 765	6	24
825	1 145	530	1 065	345	710	890	—	—	115	105	115	1 920	6	24
900	1 220	565	1 150	375	760	950	—	—	140	105	115	2 070	6	24
1 050	1 370	675	1 295	475	760	1 330	570	760	150	115	—	2 425	10	30
1 200	1 525	735	1 445	535	915	1 425	585	840	175	120	—	2 715	10	30

(All dimensions in millimetres)

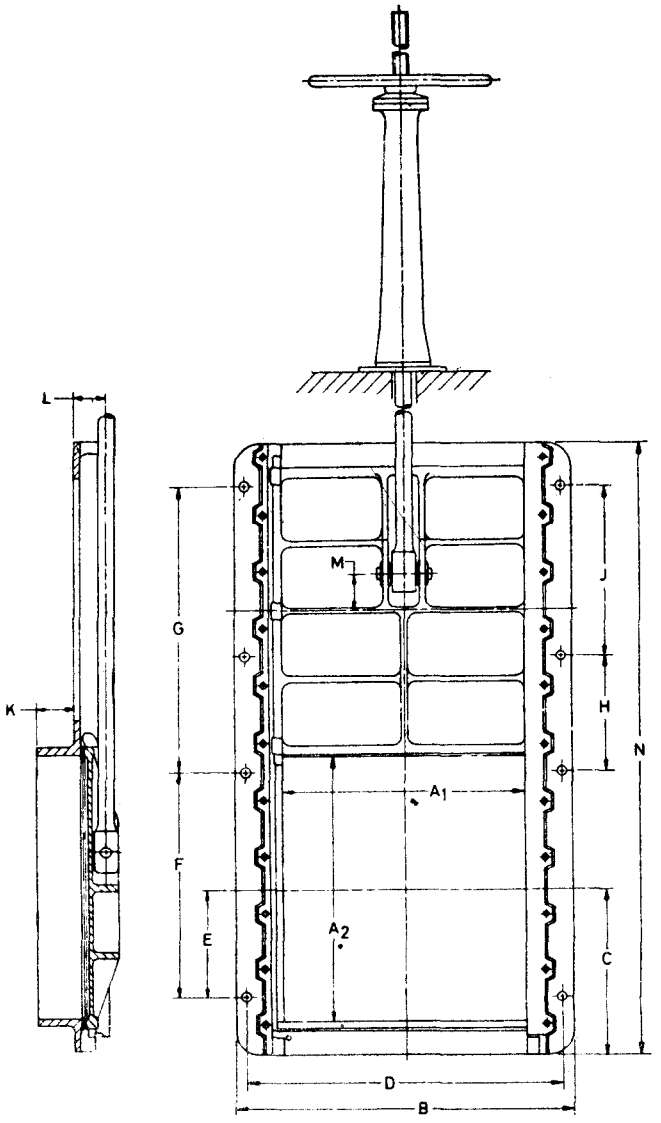
FIG. 3 DIMENSIONS OF SINGLE FACED SLUICES 200 mm TO 1 200 mm (RISING TYPE)



A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*J*	*K*	*L*	*M*	*N*	Binding Bolts No.	Binding Bolts dia.
200	465	215	415	70	420	—	—	—	85	80	630	700	4	20
250	465	215	415	70	420	—	—	—	85	80	630	700	4	20
300	515	240	465	85	475	—	—	—	85	80	725	800	4	20
450	710	325	660	145	380	380	—	—	85	90	995	1 130	6	22
600	890	405	825	240	535	535	—	—	85	100	1 260	1 445	6	24
750	1 065	490	990	305	710	710	—	—	115	100	1 470	1 765	6	24
825	1 145	530	1 065	345	710	890	—	—	115	105	1 615	1 920	6	24
900	1 220	565	1 150	375	760	950	—	—	140	105	1 735	2 070	6	24
1 050	1 370	675	1 295	475	760	1 330	570	760	150	120	2 055	2 565	8	30
1 200	1 525	735	1 445	535	915	1 425	585	840	175	120	2 310	2 880	8	30

(All dimensions in millimetres)

FIG. 4 DIMENSIONS OF SINGLE FACED SLUICES 200 mm TO 1 200 mm (NON-RISING TYPE)



A		B	C	D	E	F	G	H	J	K	L	M	N	Binding Bolts	
A_1	A_2													No.	dia.
300	375	515	285	465	120	330	330	—	—	90	95	—	975	6	20
450	300	665	240	615	85	475	—	—	—	90	95	—	800	4	20
375	450	635	325	585	145	380	380	—	—	90	95	—	1 130	6	22
525	375	785	285	735	120	330	330	—	—	90	95	—	975	6	20
450	525	710	360	660	185	370	555	—	—	90	95	—	1 280	6	22
600	450	865	325	815	145	380	380	—	—	90	95	—	1 130	6	22
525	600	785	405	725	240	535	535	—	—	90	95	—	1 445	6	24
675	525	940	360	875	185	370	555	—	—	90	95	—	1 280	6	22
600	675	890	445	825	280	535	710	—	—	90	95	85	1 600	6	24
750	600	1 040	405	980	240	535	535	—	—	90	95	—	1 450	6	24
675	750	965	490	900	305	710	710	—	—	115	100	95	1 765	6	24
823	675	1 120	445	1 055	280	535	710	—	—	90	95	85	1 600	6	24
750	825	1 065	530	990	340	710	890	—	—	115	105	115	1 920	6	24
900	750	1 220	490	1 145	305	710	710	—	—	115	100	95	1 765	6	24
825	900	1 145	565	1 065	375	760	950	—	—	140	105	115	2 070	6	24
1 050	900	1 370	565	1 300	375	760	950	—	—	140	105	115	2 070	6	24
900	1 200	1 220	735	1 150	535	915	1 420	580	840	140	120	240	2 715	8	30
1 200	900	1 525	565	1 455	375	760	950	—	—	140	105	115	2 070	6	24
1 050	1 200	1 370	735	1 295	535	915	1 420	580	840	140	120	240	2 715	8	30
1 200	1 050	1 525	570	1 450	475	760	1 330	570	760	140	115	159	2 450	8	30

(All dimensions in millimetres)

FIG. 5 DIMENSIONS OF SINGLE FACED SLUICES 300 × 375 mm TO 1 050 × 1 200 mm (RISING TYPE)

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