ii. Directly mounted on face of Wall.

a. Flat back frame gates:
   These gates have a flat back frame which is anchored directly on the face of wall and the gap between the wall face and the flat face of the frame is sealed with secondary stage grout.

Once installed these gates can be removed for repairs but the possibility of breaking of the second stage concrete remains.

These gates are generally made similar to gates as per AWWA C560 & BS7775. These gates are suitable for seating as well as low unseating head applications.

b. Spigot back frame gates:
   These gates have a spigot which gets embedded in the wall and the frame face is anchored directly on the face of wall.

Once installed these gates cannot be removed for repairs without substantially breaking the concrete.

These gates are made generally as per IS3042. These gates are suitable only for seating head application and are not suitable for unseating head application.

B. For mounting between two parallel side walls (to isolate flow within an open channel)

   These gates are embedded and anchored in grooves provided in the side walls of the channel and are installed where there is no breast wall and where head of water is always less than the height of shutter.

   These gates are suitable for seating as well as unseating head applications.

3. DIRECTION OF GATE OPENING:

A. Upward opening gate:
   The sluice gates in which the shutter travels upwards to open in the side guides of frame extending above the gate frame opening are called upward opening gates.

These gates are used where there is adequate clearance between the top of gate opening / aperture and the floor above the gate to enable the shutter to raise to open.

B. Downward opening gate:
   The sluice gates in which the shutter travels downwards to open in the side guides of frame extending below the gate frame opening are called downward opening gates.

These gates are used where there is inadequate space between the top of gate opening / aperture and the floor above the gate to enable the shutter to open.

These type of gates can be used for decanting from a reservoir but not for precise level control. Hence these gates cannot be considered as being same as downward opening weir gates.

4. TYPE OF WATER HEAD:

A. Seating / on-seating water head:
   When the water pressure tends to press the door/shutter on to the gate frame then the type of water head is called seating / on-seating water head.

Sluice gates as per AWWA C560 / BS 7775 / IS13349 / IS3042 are suitable for seating water head application.

Gates suitable for seating water head application are provided with side wedges only.

B. Unseating / off-seating water head:
   When the water pressure tends to push the door/shutter away i.e. unseat from the gate frame then the type of water head is called unseating / off-seating water head.

Only the sluice gates as per AWWA C560 / BS 7775 / IS13349 / IS3042 are suitable for unseating water head applications. Sluice gates as per IS:3042 are not suitable for unseating water head applications.

Gates meant for unseating water head application are, depending upon size of gate and applicable water head, provided with top wedges at the top sill and either bottom wedges or flush bottom closing arrangement at the bottom sill, in addition to the usual side wedges. The purpose of these top and/or bottom wedges is to minimize the outwards deflection of door / shutter at the top and/or bottom sealing edge and reduce the leakage.

C. Seating as well as unseating water head:
   There may be situations in a particular gate installation, where the water pressure condition may be either seating or unseating at different points of time depending upon the net difference between the water levels on either side. Such applications will necessitate a gate to be suitable for seating as well as unseating water head conditions.

Only the sluice gates as per AWWA C560 / BS 7775 / IS13349 are suitable for such applications. Sluice gates as per IS:3042 are not suitable for such applications.
5. TYPE OF BOTTOM CLOSURE:

A. Conventional bottom / rebate invert type closure:

In case of conventional bottom / rebate invert type closing gates, water sealing at the invert of the gate is achieved by providing metallic sealing strips/faces along the width of gate opening at the bottom of shutter as well as bottom of frame. These strips, provided at a position that is below the invert of gate opening, remain in close mating contact when the gate is fully closed.

To enable mounting of such gates ample vertical clearance between the invert of gate and invert of chamber/channel is required. This vertical clearance in form of a wall below the gate invert does not allow complete flushing of chamber, if needed. If this is acceptable then conventional bottom closing gates can be used.

If gate with conventional bottom closing is installed at a situation, where the bottom of gate opening is to be at the same level as the invert of the chamber/channel or where ample vertical clearance between invert of gate and invert of chamber/channel is not available, then a recess or a cut out is required to be provided in the invert of floor to enable mating between bottom sealing faces of frame and shutter when the gate is fully closed.

Debris, silt and foreign material may then collect in the cut out/recess and this may prevent the gate from closing fully thereby giving rise to heavy leakage. In such locations only Flush bottom closure gates should be used.

B. Flush bottom / Flush invert closure:

In the locations where there is no scope of providing ample vertical clearance between the invert of the gate and the chamber floor or especially in case of channels where the invert of the gate and the chamber floor are to be at the same level, or when complete drainage of the chamber is required, gates with flush bottom / flush invert closing are adopted.

In case of flush bottom closing gates, water sealing at the bottom of gate is achieved by providing a resilient rubber seal pressing against a machined cast iron face, the contacting faces between the two being at the same level as that of the gate invert and chamber/channel floor. This avoids the need to provide a permanent slot or cut out or box out in the channel floor. Since there is no slot or cutout at the gate invert there is no chance of accumulation of foreign material and of impediment to flow and interference with proper closing of gate. Whatever foreign materials like debris, gravel, silt etc. that might settle at the gate invert get flushed out with the flow as soon as the gate is opened.

With flush bottom closing gates, bottom wedges are not provided since such gates are free from problems inherent with deflection of bottom of shutter.

After the gate is erected in position, the temporary recess or cut out required to be provided in the invert/floor to accommodate bottom portion of sluice gate frame should be filled up with easily removable materials like asphalt surfacing material or concrete containing saw dust to ensure unobstructed invert surface.

6. TYPE OF SPINDLE MOVEMENT:

A. Rising Spindle Gates:

The sluice gates in which the spindle rises and lowers during upward and downward movement of shutter while opening and closing of sluice gate are called rising spindle gates.

These gates have non-rotating spindle and rotating lift nut housed in lift mechanism which remains well above water level. Since the rotating lift nut and engaging threaded stem are above platform these can be regularly cleaned and lubricated. Moreover, the spindle extending above the lift mechanism also gives an indication of the extent of closure/opening of gate.

B. Non-rising spindle gates:

The sluice gates in which the spindle remain at the same position during upward and downward movement of shutter while opening and closing of sluice gate are called non-rising spindle gates.

Since the threaded portion of stem and lift nut remain submerged, they remain exposed to damage and corrosion. Regular cleaning and lubrication of such submerged parts is impossible. Moreover, debris or mishap jamming in the spindle threads may create difficulty in gate operation.

Use of non-rising spindle gates should be avoided wherever possible. Such gates should be used only in those locations where there is a limited head room or where the rising stem is likely to interfere with some other part of the installation over the top of lift mechanism or where the rising stem should not project above road level.

7. MOUNTING POSITION OF LEFT MECHANISM & THRUST REACTION:

A. Mounted separately on platform away from gate frame / Thrust platform:

When the distance between center line of gate opening to top of operating platform is more than 2 times the height of gate opening then the operating headstock is generally mounted on a civil platform or a fabricated platform located above the gate frame. In this case the thrust reaction comes on the platform and not on the gate frame.

For such cases the gate frame can have short length extension guides to retain atleast one half the vertical height of the shutter when the shutter is in the open position. Such gate frames having short length extension guides are also called “Open Top” frames.

When the lift mechanism is mounted on a platform away from gate frame it is essential to specify all and platform levels or distance from centre line of waterway opening to the top of platform for every gate required. This helps determine the length of spindle to be supplied as also the number of stem couplings and stem guides necessary for the installation.
B. Mounted directly on the frame of sluice gate / Thrust on gate frame:
When the distance between the center line of waterway opening and top of operating platform is not sufficient to accommodate a platform, or when there is no suitable concrete structure available for mounting the headstock above the gate, or when making a platform to take the operating load is impractical or unnecessarily costly, then the operating headstock is mounted on the top of gate frame. In this case the thrust reaction comes on the gate frame and not on the platform.

For such cases the gate frame is provided with full length extension guides to retain the vertical height of the shutter when the shutter is in the open position. The extension guides are then connected through a bridge / yoke which transfers the thrust coming from operating headstock on to the gate frame.

Such gate frames having full length extension guides with yoke are also called “Closed Top” frames and these types of sluice gates with the operating headstock mounted on the yoke of gate frame are called “Self Contained” sluice gates.

8. METHOD OF GATE OPERATION:
A. Manual operation:
Manual operation of sluice gates is recommended when frequency of gate operation is low and when there is no constrain in time required for opening and closing of a gate.

Manual operation can be effected by means of either ungeared or geared type lift mechanism. Selection of the type of lift mechanism depends on the hoisting capacity required for each gate. It should enable gate operation by a single person with an effort not more than 20 Kgs.

Lift mechanism with high gear ratios is recommended with two speed operation to enable faster opening of gate after it is crack opened.

Manually operated gates can be provided with electric / hydraulic portable operator for faster operation of gates.

B. Mechanized operation:
Mechanized operation of sluice gate is recommended when frequency of operation of gate is high and where faster gate operation is required.

Mechanized operation can be effected by means of electric / pneumatic / hydraulic actuation. Manual override facility is recommended for operation of electric operated gate in case of electric failure and for operation of pneumatic operated gate in case of electric / pneumatic failure.

### CLASSIFICATION OF MODELS OF JASH WATER CONTROL GATES

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<tr>
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<th>Type of Mounting</th>
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<tr>
<td>19.</td>
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<tr>
<td>20.</td>
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<td>CP-SL-WM</td>
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</tbody>
</table>

These models covers products which are popular and routinely required by the industry. In addition to above Jash also offers varied other designs to suit specific requirements of the client based on their requests.
IMPORTANT PARTICULARS TO BE FURNISHED BY THE PURCHASERS WITH THEIR ENQUIRY OF GATES

1. Type of application
   (a) Isolate flow in & out of a conduit, or
   (b) Isolate flow in an-open channel, or
   (c) Drainage from outfall structure to river/sea, or
   (d) Weir application.
   (e) Modulating application.

2. Type of mounting
   (a) Mounted directly on face of wall (for 1a, 1c, 1d & 1e above), or
   (b) Mounted on C.I wall thimble (for 1a, 1c, 1d & 1e above), or
   (c) Mounted on flanged end of a pipe (Please furnish pipe flange and drilling details).

3. Size and shape of gate opening i.e. whether circular, square or rectangular. If rectangular, size shall be specified as Width x Height of opening since the first of the two dimensions is always conventionally reckoned as the width of opening.

4. Design head i.e distance from surface of water to centerline of gate in meters for which gate is to be designed.

5. Type of head
   (a) Seating, or
   (b) Unseating, or
   (c) Seating as well as unseating head.

6. Operating head i.e. maximum head against which the gate is to be opened or closed.

7. Distance from centerline of gate opening to top of operating platform in meters.

8. Type of bottom closure
   (a) Conventional bottom closure, or
   (b) Flush bottom closure.

9. Type of spindle i.e. whether
   (a) Rising spindle, or
   (b) Non-rising spindle.

10. Type of actuation
    (a) Manual, or
    (b) Electrically actuated with manual override, or
    (c) Pneumatically actuated with manual override.

11. Painting requirement.

12. Stem cover or pipe hood for stem, whether required.

13. Gate opening indicating arrangement whether required.


Additional information required to be furnished:

(a) Type of fluid to be handled.
(b) Quantity required for each similar size and type of gate.
(c) Required direction of gate opening i.e. whether upwards, downwards or sideways.
(d) Whether the gate is to be self-contained type with lift mechanism mounted on yoke of gate frame.
(e) Depth and shape of wall thimble.
(f) Wall thickness where the gate is to be installed.
(g) Distance from gate invert to sump invert in meters.
(h) Type of fitment of seat facings i.e. whether (i) Fitted on plain machined faces, or (ii) Fitted in rectangular machined grooves, or (iii) Fitted in dovetailed machined grooves.
(i) Any special design and/or construction feature required to meet specific operational requirement.
(j) Civil drawing showing the location where the gate is to be fixed.

JASH FLANGE / FLAT BACK FRAME THIMBLE MOUNTED CAST IRON SLUICE GATES (MODEL: C-FSG-TM)

SPECIFICATION:
These are wall-thimble mounting flange / flat back frame sluice gates made generally as per AWSA C560 / BS 7775 / IS 13349.

APPLICATION:
These sluice gates are mounted on the face of a wall via wall thimble and are used to isolate flow in and out of a conduit. Such gates can be manufactured for seating as well as unseating head applications upto 40 meters.

Flange back frame sluice gates can also be mounted on paddle pipe flange provided dimensions and hole drilling on the flange of gate frame are specifically provided to match pipe flange or vice versa.

Flange back frame sluice gates are highly recommended where maximum practical water tightness is an important criterion for the gate and hence for which a gate shop tested at the manufacturer's works for its actual leakage performance is a must.

ADVANTAGES:
- Civil construction schedules can be advanced as thimbles can be made and supplied earlier for precise embedment in concrete. The sluice gate can then be mounted later when received.
- The installed gate can be dismantled without breaking concrete and remounted with equal ease. This helps removal for repairs and future replacement. If required, opening can be kept sealed with a blind flange when the gate is not there.
- Erection and installation procedure becomes simple and economical.
- Mounting the gate through machined flanges of wall thimble and gate frame, with a gasket joint in-between, helps maintain alignment and proper contact between the mating sealing faces. This improves water sealing characteristic of the gate.
- Machined back flange of gate makes it possible to mount the gate on a test bench for shop leakage testing at the manufacturer's works for verifying actual leakage and soundness of casting at operating head. This helps ensuring and verifying the specified leakage limits and ensuring required quality standards.

SALIENT FEATURES:
- Wall thimble of F-shaped or E-shaped section as required.
- Rigid flange / flat back gate frame designed for mounting on face of wall thimble using studs and with a rubber gasket between gate frame and wall thimble.
- Open top frame provided with short length extension guides to retain at least one half the vertical height of the shutter when the shutter is in the open position.

- Adjustable type cast iron wedging devices lined with non-corroding metal strips / wedges. Adjustable wedges on shutter allow future on site adjustment of wedges to enable increased edging action and compensate for possible wear of sealing faces.