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Thinking Innovative, Since 1948

JASH WATER CONTROL GATES

Over 10,000 gates in operation



When Every  Counts

TRAINING PROGRAMME ON WATER CONTROL GATES

Selection Procedure



Explanation of Terms



Standard Accessories



Optional Accessories



Operation & Maintenance



Trouble Shooting at Site



SELECTION PROCEDURE



INTRODUCTION

A sluice gate or a slide gate is a custom manufactured product and its correct selection is dependent on numerous variables. As a result, most users find it very difficult to arrive at the correct configuration (Technically and Economically) of the sluice gate / slide gate that they require for a particular application.

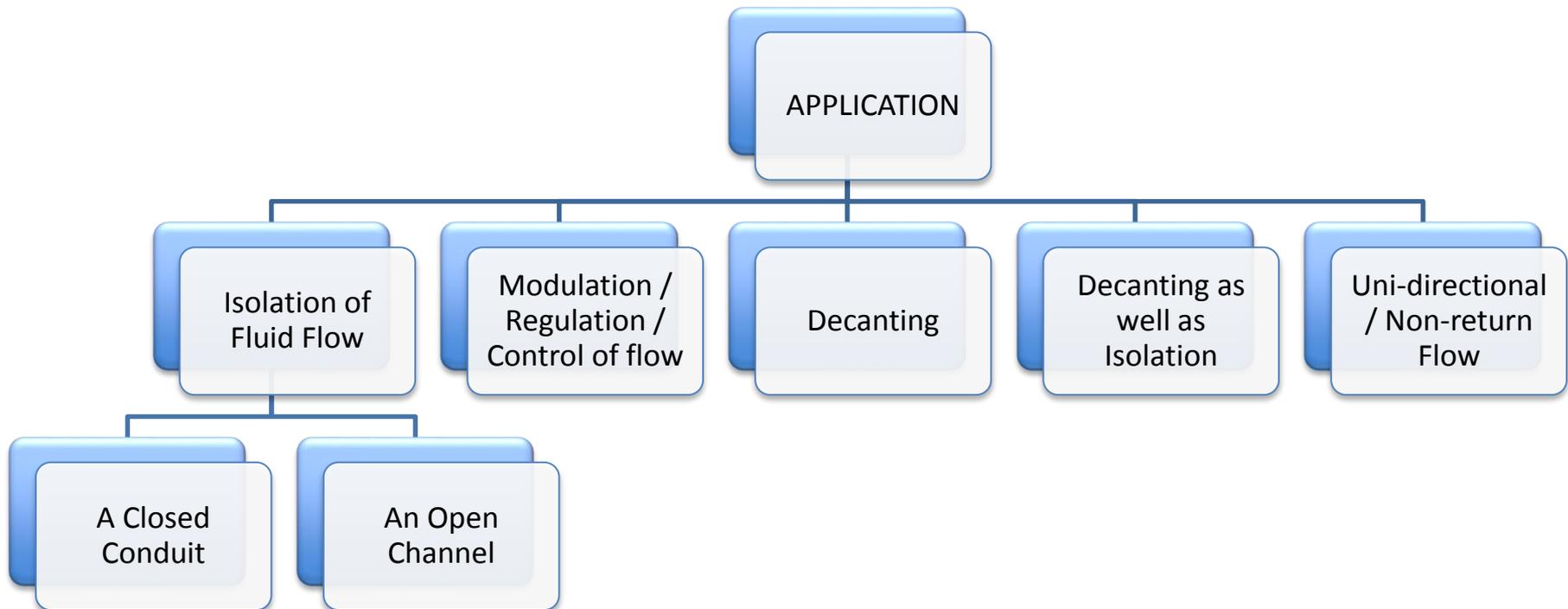
The type of gate to be used and features required to be incorporated in a gate varies from location to location in the same plant. To arrive at the final configuration of the gate to be used, follow the procedure as given hereunder:

S. No.	Selection Basis	Reason
1.	Application	Based on application, decide the most appropriate type of water control equipment required.
2.	Operational Requirements	Based on operational requirements, decide the most suitable equipment required (Sluice / Slide gate or a Stop log).
3.	Fluid	Based on fluid to be handled, decide various principal material of construction options that can be considered.
4.	Functional Parameters	Based on functional requirements, decide the best possible material of construction option.
5.	Location of Installation	Based on location of installation, decide the installation specific features desired for each type of equipment.
6.	Operating Arrangement	Selecting the type of operating arrangement which is most appropriate for each location.
7.	Additional Accessories	Finally choose the additional accessories required for each location.

The above process would lead you to arrive at the most appropriate technical and economical solution for each location of installation.

I. TYPE OF WATER CONTROL EQUIPMENT REQUIRED BASED ON APPLICATION :

The types of water control equipment required vary according to the application. The following are the 5 applications which are most commonly used in practice:



I. TYPE OF WATER CONTROL EQUIPMENT REQUIRED BASED ON APPLICATION :

- 1) For **Isolation of fluid flow** i.e. for either complete closing of an opening or for fully open condition. The types of opening for which isolation applications apply are:
 - a) A closed conduit : A sluice gate with 4-side sealing arrangement is used to isolate the conduit. A stoplog with 4-side sealing may also be used for this purpose.
 - b) An open channel : A sluice gate with 3-side sealing arrangement (on 2 vertical sides and on bottom) is used to isolate the channel. A stoplog with 3- side sealing can be used as well.
- 2) For **Modulation / Regulation / Control of flow** ie for partial closing / opening or throttling in a closed conduit. A sluice gate / slide gate with 4 sides sealing arrangement with suitable design modifications to suit the application is used. Stoplogs cannot be used for this application.

I. TYPE OF WATER CONTROL EQUIPMENT REQUIRED BASED ON APPLICATION :

- 3) For **Decanting** i.e., removal of floating sludge or other waste from a reservoir or water level control purpose. A weir gate with continuous sealing at any level of opening on the 2 vertical sides and on the bottom side is used for precise level control. For coarse level control a multi-piece stoplog can be used.
- 4) For **Decanting as well as Isolation application**. A weir gate with 4 side sealing arrangement is used for this purpose. Stoplogs are unsuitable for this application.
- 5) For **Uni-directional / non-return flow** i.e. allowing water to flow out but not flow back or come in. A flap gate / valve opening automatically based on differential water head is used for this application. Neither sluice / slide gates nor stoplogs are suitable for this purpose.

II. MOST SUITABLE TYPE OF EQUIPMENT REQUIRED (SLUICE GATE OR STOP LOG):

Some of the 5 applications covered earlier can be met by using either sluice gate or a stoplogs. Select which of these two types of equipment is most appropriate for your requirement.

1) Sluice Gates

Sluice gates / slide gates are generally used in those applications where immediate closure or isolation of waterway opening is required to be done in a short time (say within 1 hour) using a single person, where isolation / operation requirement is frequent and where leakage requirement is stringent.

As each sluice gate / slide gate is provided with its own operating arrangement, these can be opened or closed by a single person in a short time. Due to this reason, the overall equipment cost is higher as compared to stoplogs but the operating cost and operational difficulty is much lower in comparison and large aisle and wide spaces in the plant are not required to be provided for operational requirement like in case of stoplogs.

II. MOST SUITABLE TYPE OF EQUIPMENT REQUIRED (SLUICE GATE OR STOP LOG):

2) Stoplogs

Stoplogs are generally used in those applications where immediate closure or isolation of waterway opening within a short time is not required, where more than one person is available for operation and where isolation requirement is infrequent and relatively higher leakage is acceptable. Also Stoplogs can be used only in those projects where sufficient space is available for transportation of logs from their storage space / location to the location of their installation.

A stoplog can be operated using portable operating arrangement that can be moved from one location to another. Also, a stoplog is suitable for insertion in multiple frames installed at different locations, provided that the stoplog and the frames are of same width. On account of these two advantages, the overall equipment cost of stoplog is lower in comparison to sluice / slide gate but the operating cost as well as operational difficulty is higher in comparison.

II. MOST SUITABLE TYPE OF EQUIPMENT REQUIRED (SLUICE GATE OR STOP LOG):

2) Stoplogs

These are generally installed in open channel installation where height of water is less than the total height of the stoplogs. The height of stoplog is kept such that it covers the specified water depth. In cases where the height of water is very high or when there is a weight restriction in handling, multi-piece stoplogs are used instead of using a single piece stoplog. Multi-piece stoplogs comprise of number of logs of smaller heights stacked over one another to cover the full depth of water. Larger sized stoplogs can also be provided with equalizing valves so as to enable lifting them in balanced water head condition.

II. MOST SUITABLE TYPE OF EQUIPMENT REQUIRED (SLUICE GATE OR STOP LOG):

3) Selection criterion for Sluice gate / Stoplog

S. No.	Criterion / Conditions for usage	Sluice / Slide Gates	Stoplogs
1.	Immediate response	Suitable	Not Suitable
2.	Frequent Operation	Suitable	Not Suitable
3.	Leakage Criterion	Very low leakage	Higher leakage
4.	Manpower Requirement	Low	High
5.	Space requirement for handling & storage	Low	High
6.	Equipment Cost	High	Low
7.	Operating Cost	Low	High
8.	Operational difficulty	Low	High

Once it is decided which type of equipment is most suitable for your application then you would have to choose the various possible material of construction options for the chosen equipment.

III. MATERIAL OF CONSTRUCTION OPTIONS BASED ON FLUID TO BE HANDLED:

Type of Fluid / Application	Materials						
	Metallic				Non-Metallic		
	Cast Iron	Stainless Steel	Carbon Steel	Aluminum	FRP	HDPE	Composite
Raw Water	Suitable with paint coat	Suitable	Suitable with paint coat	Suitable with anodizing / coating	Suitable	Suitable	Suitable
Drinking / Chlorinated Water	Suitable with NSF approved paint coat	SS-316 L grade stainless steel preferred	Not suitable due to corrosion	Suitable but life is reduced in case of chlorinated water	Suitable but life is reduced in case of chlorinated water	Suitable but life is reduced in case of chlorinated water	Suitable but life is reduced in case of chlorinated water
Sewage	Suitable with epoxy coat	Suitable	Not suitable due to corrosion	Suitable with anodizing / coating	Suitable for low head	Suitable for low head	Suitable for low head

III. MATERIAL OF CONSTRUCTION OPTIONS BASED ON FLUID TO BE HANDLED:

Type of Fluid / Application	Materials						
	Metallic				Non-Metallic		
	Cast Iron	Stainless Steel	Carbon Steel	Aluminum	FRP	HDPE	Composite
Sea Water	C.I. with 2% Ni coated with special paint	Duplex steel is suitable	Not suitable	Not suitable	Suitable for low head	Suitable for low head	Suitable for low head
Aggressive Sea Water	High Ni alloy with special paint can be used	Super Duplex steel of PREN value above 40 can be used	Not suitable	Not suitable	Suitable for low head	Suitable for low head	Suitable for low head

IV. SELECTION OF BEST POSSIBLE MATERIAL OF CONSTRUCTION FOR DECIDED EQUIPMENT BASED ON FUNCTIONAL PARAMETERS:

Description	Materials						
	Metallic				Non-Metallic		
	Cast Iron	Stainless Steel	Carbon Steel	Aluminum	FRP	HDPE	Composite
Suitable Product	Sluice gate, Weir gate, Flap gate	Sluice gate, Weir gate, Flap gate, Stoplogs					
Suitable Size range (in mm)	100x100 to 4000x6000	100x100 to 6000x6000	100x100 to 6000x6000	100x100 to 2000x4000	100x100 to 2000x2000	100x100 to 2000x4000	100x100 to 2000x4000
Suitable Water Head	Up to 35 m. (Ductile iron can be used for above 35 m)	Up to 50 m	Up to 50 m	Up to 5 m	Up to 5 m	Up to 5 m	Up to 10 m

IV. SELECTION OF BEST POSSIBLE MATERIAL OF CONSTRUCTION FOR DECIDED EQUIPMENT BASED ON FUNCTIONAL PARAMETERS:

Description	Materials						
	Metallic				Non-Metallic		
	Cast Iron	Stainless Steel	Carbon Steel	Aluminum	FRP	HDPE	Composite
Sealing options	Metal to Metal	--	--	--	--	--	--
	Metal to Rubber	Metal to Rubber	Metal to Rubber	Metal to Rubber	--	--	--
	--	Plastic to Rubber	Plastic to Rubber	Plastic to Rubber	Plastic to Rubber	Plastic to Rubber	Plastic to Rubber
	--	Self adjusting Plastic to Metal	--	Self adjusting Plastic to Metal	--	--	Self adjusting Plastic to Plastic

IV. SELECTION OF BEST POSSIBLE MATERIAL OF CONSTRUCTION FOR DECIDED EQUIPMENT BASED ON FUNCTIONAL PARAMETERS:

Description	Materials						
	Metallic				Non-Metallic		
	Cast Iron	Stainless Steel	Carbon Steel	Aluminum	FRP	HDPE	Composite
Sealing Life	Varies from 10 to 50 years based on selected sealing option	Varies from 10 to 25 years based on selected sealing option	Varies from 10 to 25 years based on selected sealing option	Varies from 10 to 25 years based on selected sealing option	Up to 15 years if rubber does not get damaged	Up to 15 years if rubber does not get damaged	Up to 15 years if rubber does not get damaged
Equipment Life	Up to 50 years	Up to 50 years	Up to 35 years	Up to 25 years	Up to 25 years	Up to 25 years	Up to 25 years

IV. SELECTION OF BEST POSSIBLE MATERIAL OF CONSTRUCTION FOR DECIDED EQUIPMENT BASED ON FUNCTIONAL PARAMETERS:

Description	Materials						
	Metallic				Non-Metallic		
	Cast Iron	Stainless Steel	Carbon Steel	Aluminum	FRP	HDPE	Composite
Maintenance	Painting required in 10 to 25 years	Seal replacement may be required in 5 to 25 years (based on selected operation)	Painting required in 3-5 years & Seal replacement may be required in 5 to 25 years (based on selected operation)	Painting required in 5 to 15 years & Seal replacement may be required in 5 to 25 years (based on selected operation)	Seal replacement may be required in 5 to 25 years (based on selected operation)	Seal replacement may be required in 5 to 25 years (based on selected operation)	Seal replacement may be required in 5 to 25 years (based on selected operation)

Having decided the best possible material of construction option for the selected equipment, the next step is to decide location specific features for each equipment.

IV. SELECTION OF BEST POSSIBLE MATERIAL OF CONSTRUCTION FOR DECIDED EQUIPMENT BASED ON FUNCTIONAL PARAMETERS:

Description	Materials						Composite
	CI	SS	MS	AL	FRP	HDPE	
Cost Comparison							
• Standard Size Small size gate 600x600 / 3m	A	1.10 A	0.70 A	0.85 A	0.87 A	0.87 A	A
• Non-standard Size Small size gate 500x700 / 3m	B	1.15 B	0.75 B	0.88 B	0.90 B	0.90 B	1.05 B
• Standard Size Medium size gate 1200x1200 / 3m	C	1.10 C	0.70 C	0.85 C	0.85 C	0.80 C	1.05 C
• Non Standard Size Medium size gate 1500x1800 / 3m	D	1.15 D	0.75 D	0.90 D	0.90 D	0.85 D	1.10 D

The above price comparison is for general indication. Variation may occur based on parameter like size, qty, head, leakage rate & other parameters.

V. SELECTION OF SPECIFIC FEATURES BASED ON LOCATION OF INSTALLATION:

Variation	Application					
	Isolation of Fluid Flow		Modulation / Control of flow	Decanting	Decanting as well as Isolation	Non-return flow
	In a closed conduit	In an open channel				
1. Type of Mounting						
• Mounting on the face of wall using thimble / pipe flange.	✓	✗	✓	✓	✓	✓
• Directly Mounting on the face of wall using anchor fastener.	✓	✓	✓	✓	✓	✓
• Partially embedded & mounted on the face of the wall using anchor fasteners.	✓	✗	✓	✓	✓	✗
• Embedding into premade grooves provided in parallel side walls	✗	✓	✗	✗	✗	✗
• Mounting on the face of parallel side walls using anchor fasteners	✗	✓	✗	✗	✗	✗

V. SELECTION OF SPECIFIC FEATURES BASED ON LOCATION OF INSTALLATION:

Variation	Application					
	Isolation of Fluid Flow		Modulation / Control of flow	Decanting	Decanting as well as Isolation	Non-return flow
	In a closed conduit	In an open channel				
2. Type of Water Head in Closed Condition						
• Seating / on-seating Water Head	✓	✓	✓	✓	✓	N/A
• Unseating / Off-seating Water Head	✓	✓	✓	✓	✓	✓
• Seating as well as Unseating Water Head	✓	✓	✗	✗	✗	N/A
3. Direction of Opening						
• Upward Opening	✓	✓	✓	✗	✗	N/A
• Downward Opening	✓	✓	✓	✓	✓	N/A

V. SELECTION OF SPECIFIC FEATURES BASED ON LOCATION OF INSTALLATION:

Variation	Application					
	Isolation of Fluid Flow		Modulation / Control of flow	Decanting	Decanting as well as Isolation	Non-return flow
	In a closed conduit	In an open channel				
4. Type of Bottom Closure						
• Conventional Bottom Closure	✓	✗	✓	✓	✓	✓
• Flush Bottom Closure	✓	✓	✓	✗	✗	✗
5. Type of Spindle Movement						
• Rising Spindle	✓	✓	✓	✓	✓	N/A
• Non-rising Spindle	✓	✓	✓	✓ #	✓ #	N/A

Not advisable as spindle is submerged in water & slurry / debris will deposit on the threads of stem.

V. SELECTION OF SPECIFIC FEATURES BASED ON LOCATION OF INSTALLATION:

Variation	Application					
	Isolation of Fluid Flow		Modulation / Control of flow	Decanting	Decanting as well as Isolation	Non-return flow
	In a closed conduit	In an open channel				
6. Mounting Position of Lift Mechanism / Position of Thrust Reaction						
<ul style="list-style-type: none"> Mounted directly on gate frame / Thrust on gate frame 	✓	✓	✓	✓	✓	N/A
<ul style="list-style-type: none"> Mounted separately on a platform away from the gate frame / Thrust 	✓	✓	✓	✓	✓	N/A

VI. CHOOSE THE TYPE OF OPERATING ARRANGEMENT FOR SELECTED EQUIPMENT:

Factors influencing selection of operating arrangement	Type of Operating arrangement			
	Manual	Electric	Pneumatic	Hydraulic
Hoisting Capacity	Moderate (upto 50,000 kgs)	High (upto 125,000 kgs)	Low (upto 5,000 kgs)	Virtually Unlimited
Opening / Closing Time or Speed	From few minutes to few hours or from 10 to 100 mm /minute depending upon height of opening and head	From few minutes to 15 minutes or from 275 to 400 mm /minute depending upon height of opening and head	From few seconds to 1 minute or from 2000 to 6000 mm /minute depending upon height of opening	From few seconds to few minutes or from 275 to 1000 mm /minute depending upon height of opening
Frequency of Operation	Low	Low / Medium / High	Low / Medium / High	Low / Medium / High

VI. CHOOSE THE TYPE OF OPERATING ARRANGEMENT FOR SELECTED EQUIPMENT:

Factors influencing selection of operating arrangement	Type of Operating arrangement			
	Manual	Electric	Pneumatic	Hydraulic
Manpower Requirement	At least 1 to 2 per gate depending upon height of opening and head.	At most 1 for few gates or none in case of remote operation	At most 1 for few gates or none in case of remote operation High	At most 1 for few gates or none in case of remote operation
Emergency Override Facility	Portable electric / portable engine driven operator can be given for emergency or faster operation	Manual override available as standard, Portable electric / portable engine driven operator can be given for emergency operation	Manual override can be given for emergency operation	Nitrogen accumulators can be given for emergency operation
Emergency Fail-Safe	Not possible	Not possible	Closure possible	Closure possible

VI. CHOOSE THE TYPE OF OPERATING ARRANGEMENT FOR SELECTED EQUIPMENT:

Factors influencing selection of operating arrangement	Type of Operating arrangement			
	Manual	Electric	Pneumatic	Hydraulic
End Position (Open / Close) feedback	Possible with limit switches	Integral with operating system	Possible with limit switches or reed switches	Possible with limit switches
Positioning Feedback	Not possible	Possible. Requires moderate additional cost to implement	Possible. Requires expensive position sensing and precise valving to implement	Possible. Requires expensive position sensing and precise electro-hydraulic valving to implement

VI. CHOOSE THE TYPE OF OPERATING ARRANGEMENT FOR SELECTED EQUIPMENT:

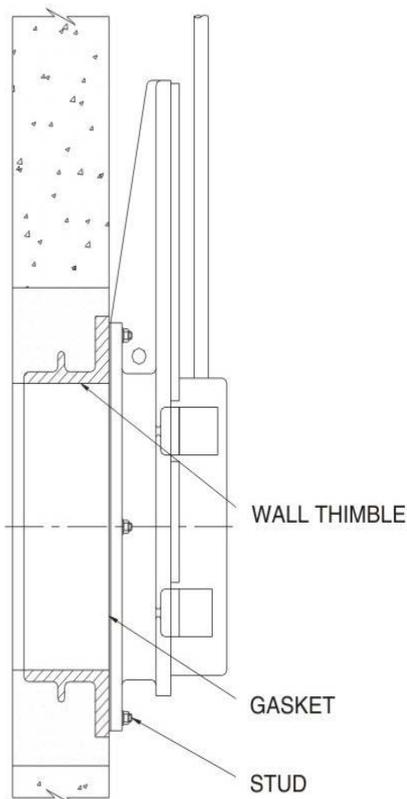
Factors influencing selection of operating arrangement	Type of Operating arrangement			
	Manual	Electric	Pneumatic	Hydraulic
Installation Ease	Simple installation requiring lesser accuracy	Simple installation requiring good accuracy. All electric operation requires simple wiring	Critical installation requiring high accuracy. Requires expensive plumbing, filtering etc.	Critical installation requiring high accuracy. Requires expensive plumbing, filtering, pumps etc.
Maintenance	Practically no maintenance required	Little maintenance required	Little maintenance required	Diligent maintenance required
Operating Life	High	Up to thousands of cycles at rated load	Dependent on design and seal wear, usually good	Dependent on design and seal wear, usually good
Preferred Gate Size	Maximum 3x3 m	Any size	Less than 1x1 m	Above 1x1 m

EXPLANATION OF TERMS



1. TYPES OF MOUNTING:

A. Mounting on face of Thimble :



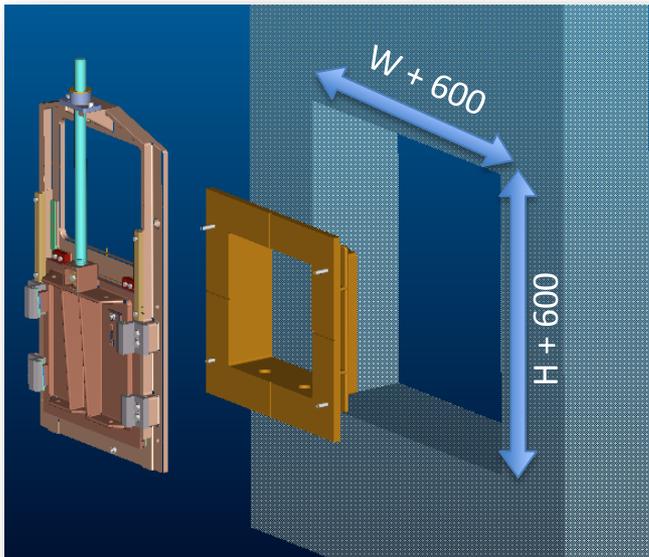
These gates are mounted on the flange of C.I. wall thimble with the help of studs. A wall thimble is a separate accessory which is first embedded in the wall with its flange flush with the face of wall.

Since no portion of the gate frame is embedded in the wall, the installed gate can be easily removed from its position for repairs, if necessary, without breaking concrete and can be remounted again with equal ease.

The thimble can be supplied earlier than the gate, and can be installed in position. The gate can be mounted on thimble later. This helps to advance construction schedule.

1. TYPES OF MOUNTING:

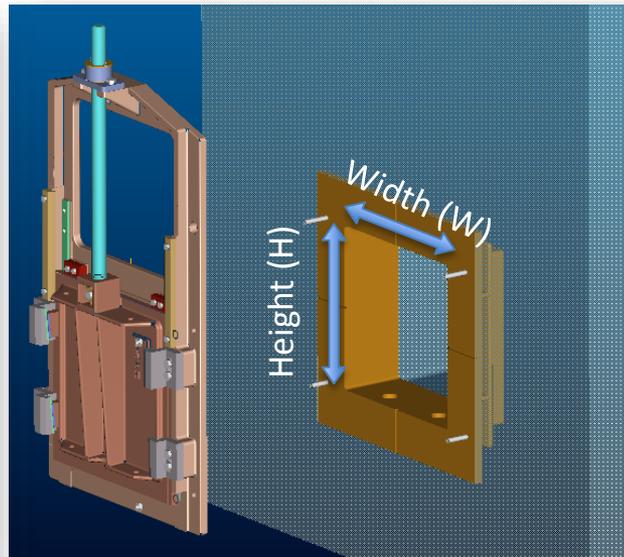
A. Mounting on face of Thimble :



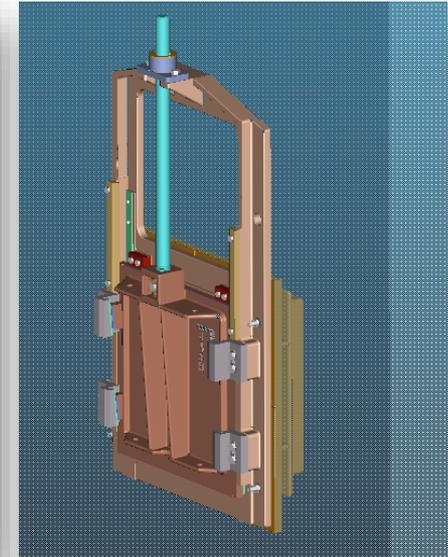
Exploded view showing block out in wall for grouting of wall thimble, F-section wall thimble and gate assembly.

W = Width of gate opening.

H = Height of gate opening.



Exploded view showing F-section wall thimble grouted in wall and ready for mounting of gate assembly.



View showing gate assembly mounted on F-section using studs & nuts on wall thimble grouted in wall.

1. TYPES OF MOUNTING:

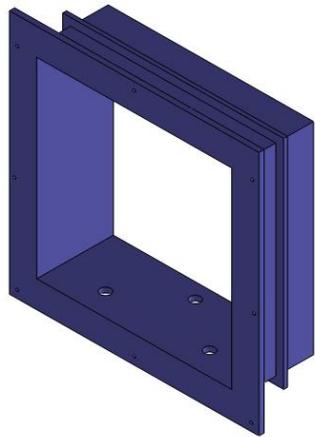
A. Mounting on face of Thimble : (Various types of thimble mounting)

I. F-Type Thimble with Square / Rectangular opening:

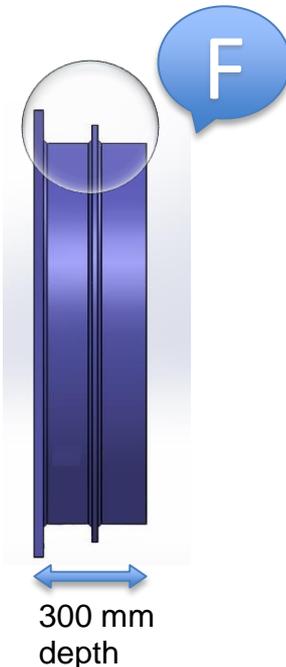
For any seating head & low unseating head application.

For application where connection to a pipe is not required

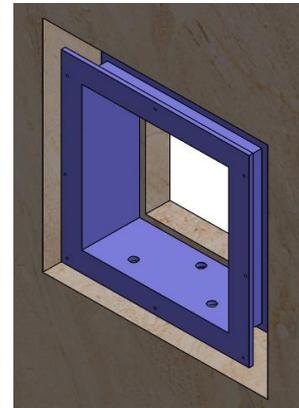
Depth: 300 mm or as required



Wall thimble with Square opening



300 mm depth



Wall thimble installed in wall

1. TYPES OF MOUNTING:

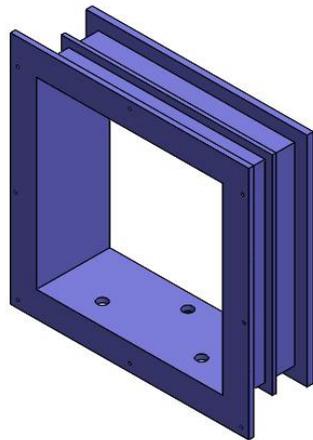
A. Mounting on face of Thimble : (Various types of thimble mounting)

II. E-Type Thimble with Square / Rectangular opening:

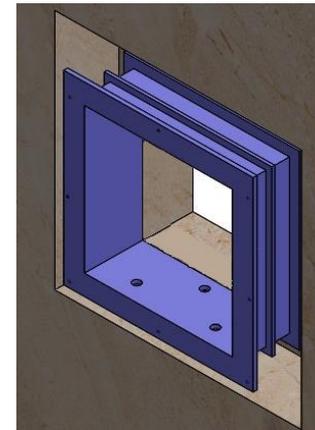
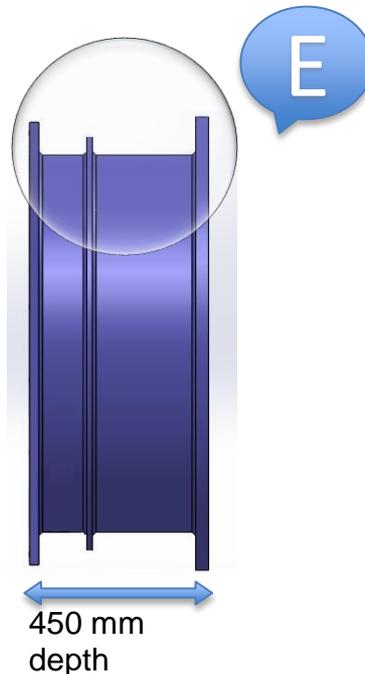
For high unseating head application.

For application where connection to a pipe is not required.

Depth: 450 mm or as required



Wall thimble with Square opening



Wall thimble installed in wall

1. TYPES OF MOUNTING:

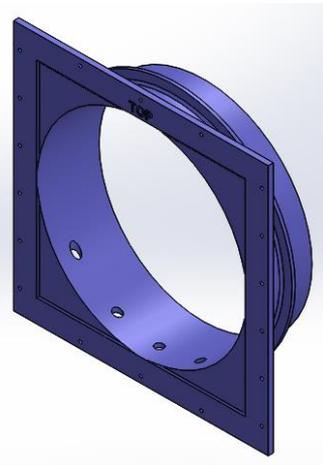
A. Mounting on face of Thimble : (Various types of thimble mounting)

III. F-Type Thimble with Round Spigot opening:

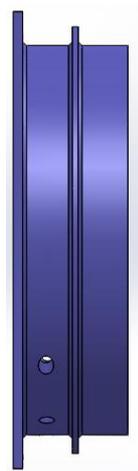
For any seating head & low unseating head application.

For application where termination to the edge of a round pipe is required.

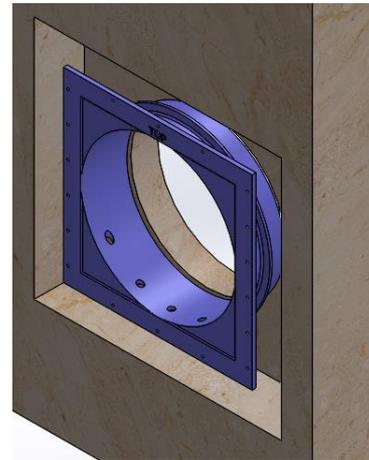
Depth: 300 mm or as required.



Wall thimble with
Round opening



300 mm
depth



Wall thimble installed
in wall

1. TYPES OF MOUNTING:

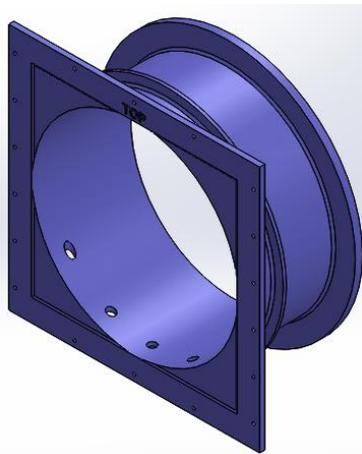
A. Mounting on face of Thimble : (Various types of thimble mounting)

IV. E-Type Thimble with Round Flange at rear:

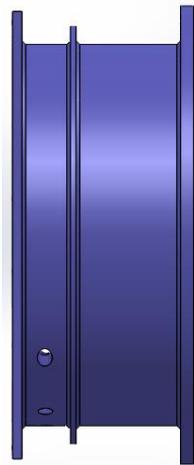
For low / high unseating head application.

For application where bolt on connection with a flanged pipe is required.

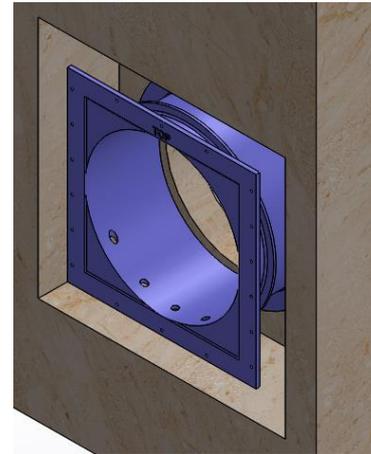
Depth: 450 mm or as required.



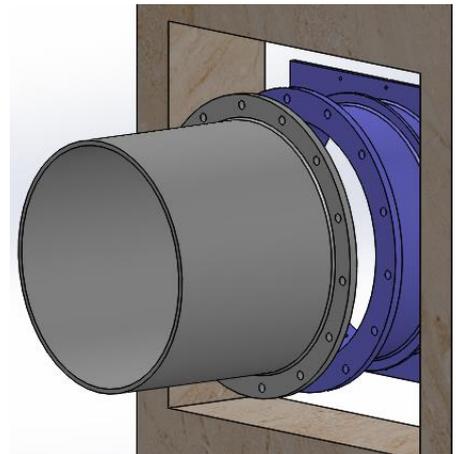
Wall thimble with Round opening



450 mm depth



Wall thimble installed in wall



Joint of thimble with pipe

1. TYPES OF MOUNTING:

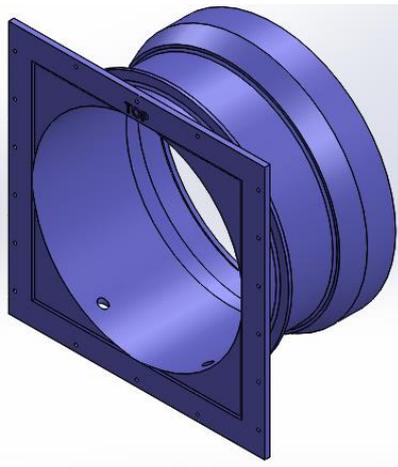
A. Mounting on face of Thimble : (Various types of thimble mounting)

V. Special thimble with round opening having MJ type end connection:

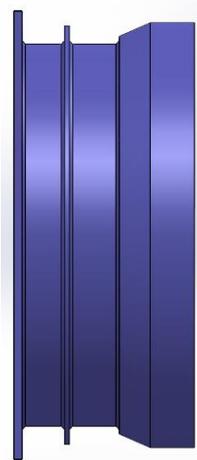
For low / high unseating head application.

For application where MJ type end connection to a pipe is required.

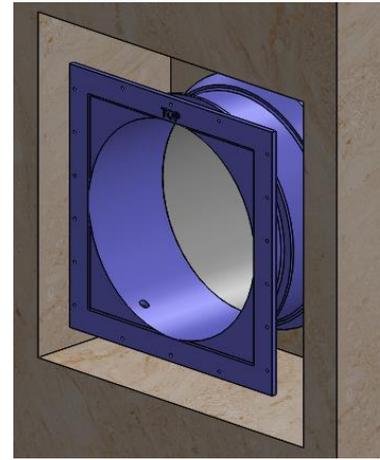
Depth: 450 mm or as required.



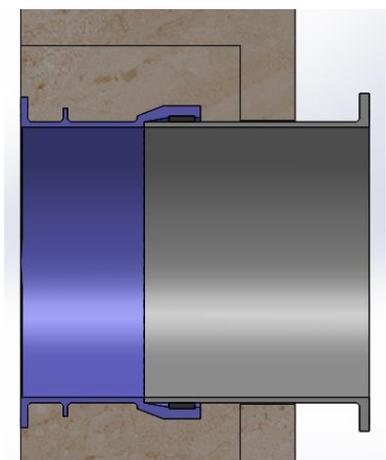
Wall thimble with Round opening



450 mm depth



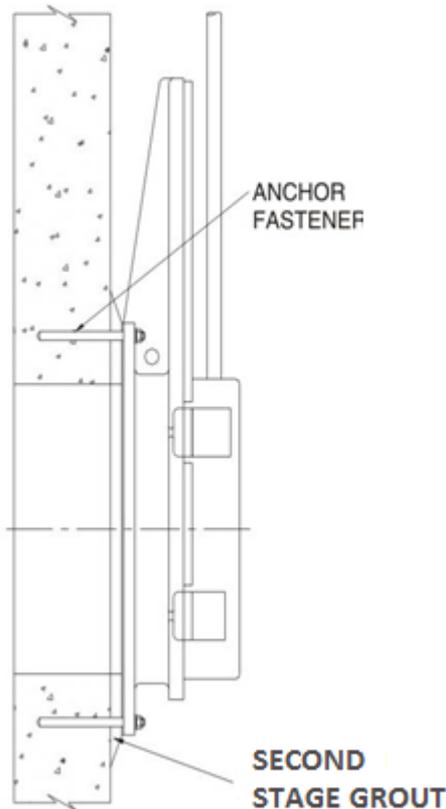
Wall thimble installed in wall



Joint of thimble with pipe

1. TYPES OF MOUNTING:

B. Mounting on face of Wall :



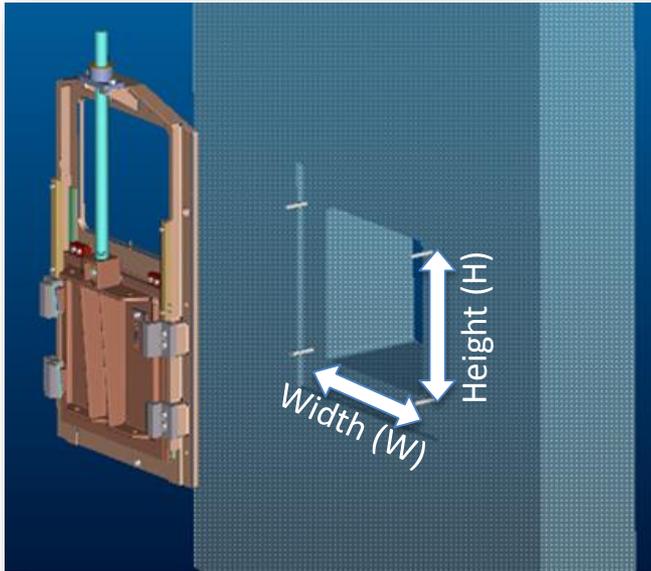
These gates have a flat back frame which is anchored directly on the face of wall.

The gap between the wall face and the flat face of the frame is to be sealed with secondary stage grout.

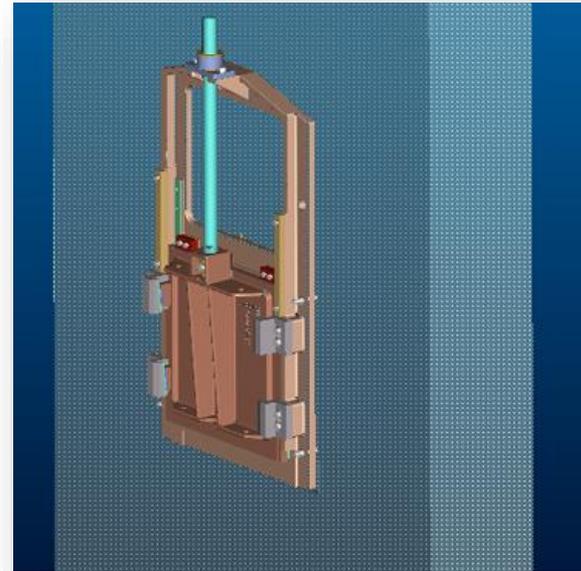
Once installed these gates can be removed for repairs but the possibility of breaking of the second stage grout remains

1. TYPES OF MOUNTING:

B. Mounting on face of Wall :



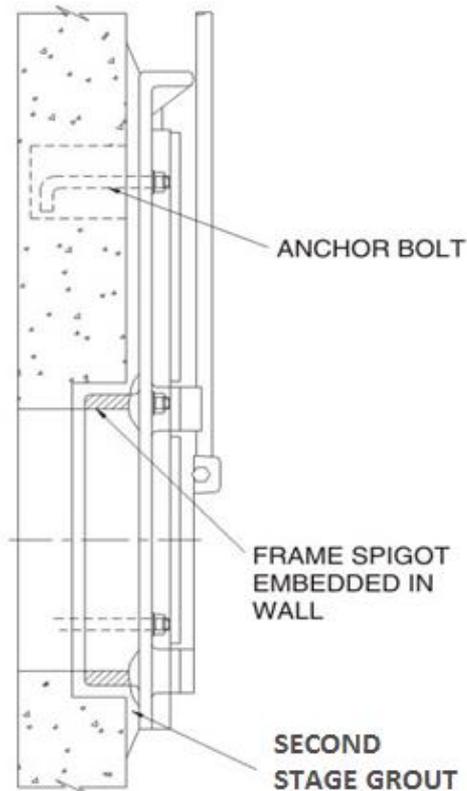
Exploded view showing anchor fasteners grouted in wall and ready for mounting of gate assembly.



Exploded View showing gate assembly mounted directly on the face of wall with secondary grout in between

1. TYPES OF MOUNTING:

C. Mounting on face of Wall & partly embedded :

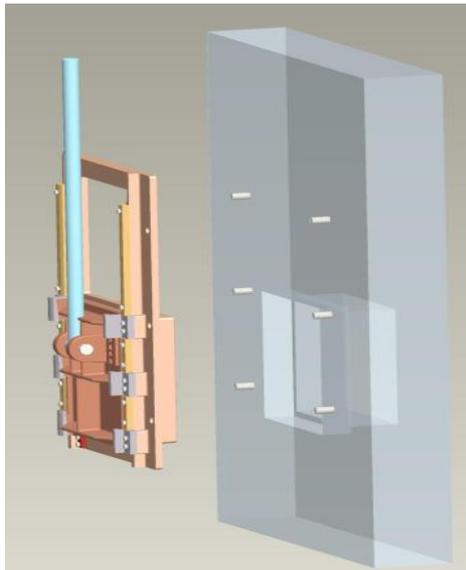


These gates have a spigot extending behind the back of frame. The spigot gets embedded in the wall and the frame face is anchored directly on the face of wall.

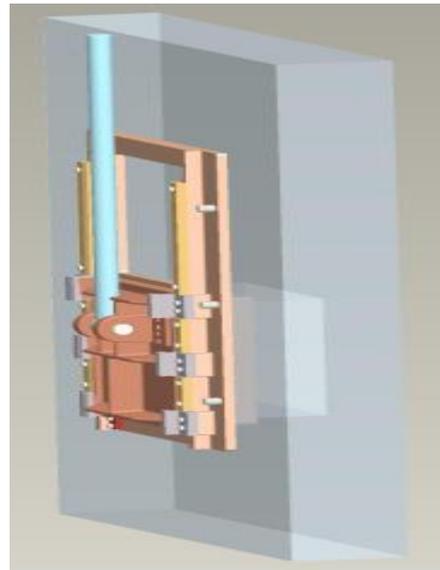
Once installed these gates cannot be removed for repairs without substantially breaking the concrete.

1. TYPES OF MOUNTING:

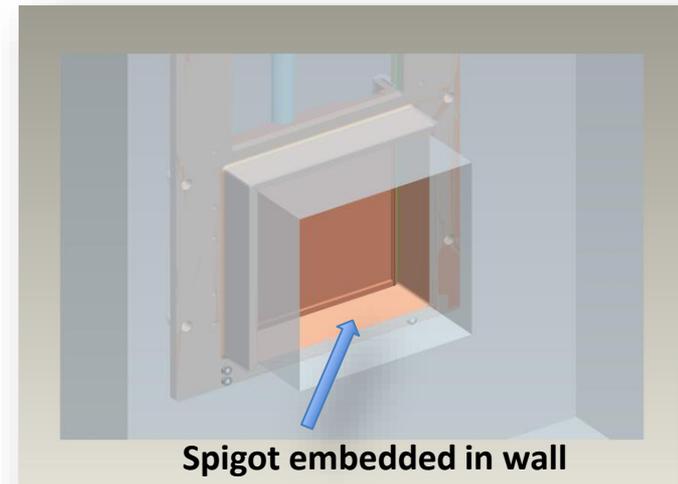
C. Mounting on face of Wall & partly embedded :



Exploded view showing anchor fasteners grouted in wall and ready for mounting of gate assembly.



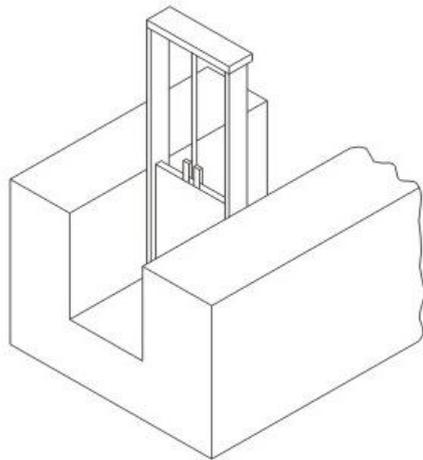
Exploded view showing gate assembly mounted directly on the face of wall with secondary grout in between



View showing back portion of spigot back frame gate assembly.

1. TYPES OF MOUNTING:

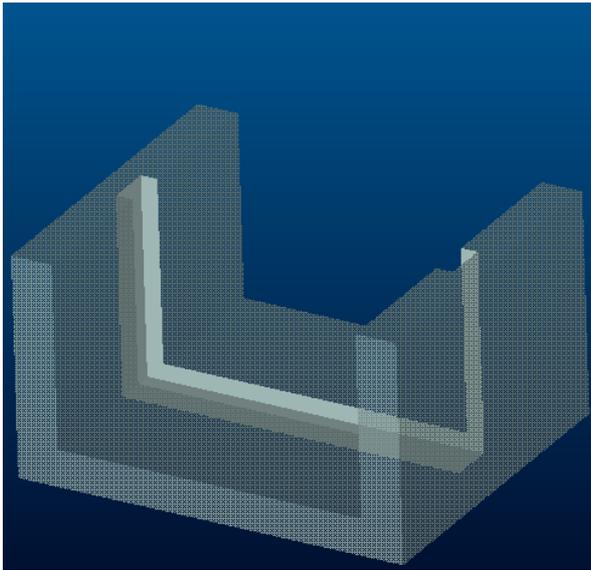
D. Mounting between two parallel side walls by Embedding :



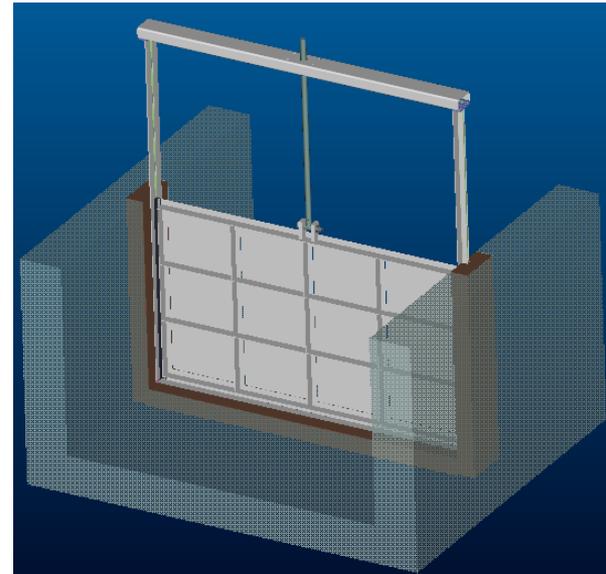
These gates are embedded in grooves provided in the side walls of the channel. These gates are installed where there is no breast wall and where head of water is always less than the height of shutter.

1. TYPES OF MOUNTING:

D. Mounting between two parallel side walls by Embedding :



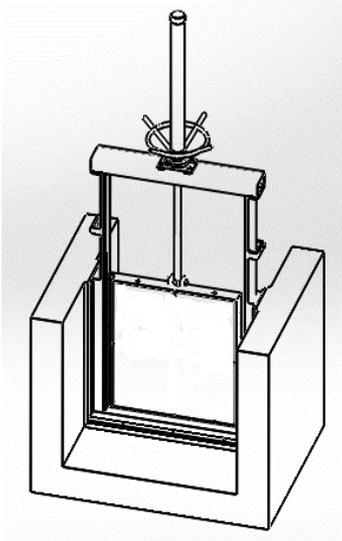
Exploded view showing side walls and bottom floor of the channel with grooves for placement of open channel gate.



Exploded view showing open channel gate installed between the side walls of the channel.

1. TYPES OF MOUNTING:

E. Mounting between two parallel side walls by Anchoring :

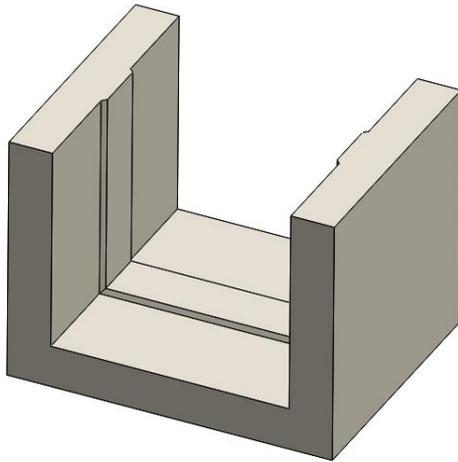


These gates are anchored in side walls and the floor of the open channel using anchor fasteners.

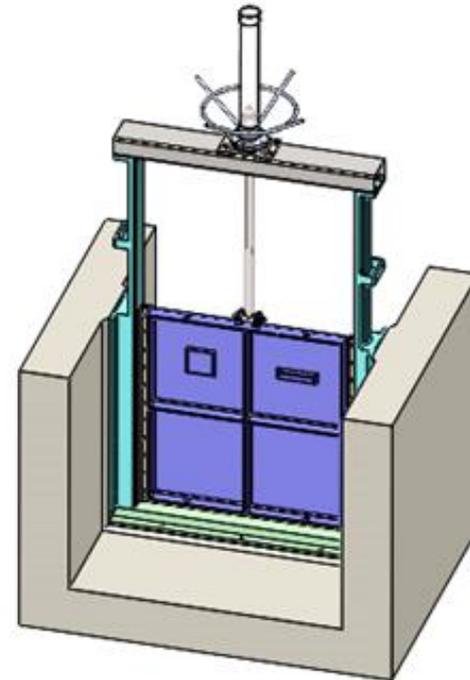
The back portion of the vertical frame guides shall be reasonably flat and drilled to engage with the anchor fasteners to be mounted on the wall. The uneven gap between the wall face and the flat face of the vertical frame guide is to be sealed using grout during installation.

1. TYPES OF MOUNTING:

E. Mounting between two parallel side walls by Anchoring :



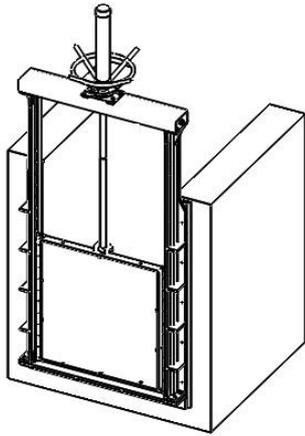
Exploded view showing side walls and bottom floor of the channel for placement of open channel gate.



Exploded view showing side walls anchored open channel gate installed between two parallel side walls.

1. TYPES OF MOUNTING:

F. Mounting on the face of wall of a channel :

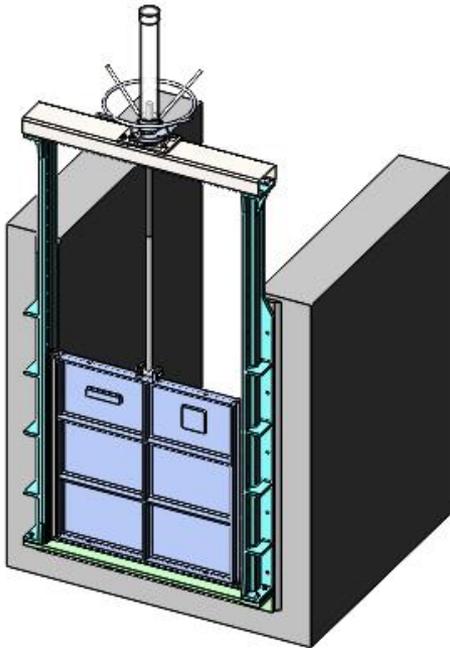


These gates are anchored on the face of wall at the end of channel using anchor fasteners.

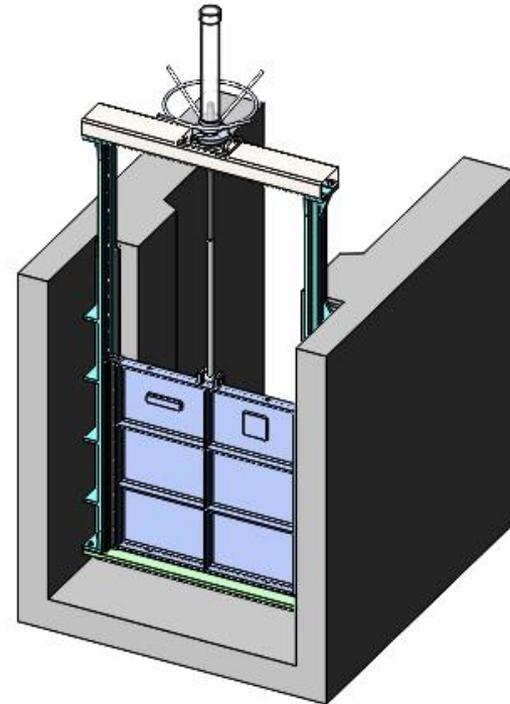
The gate frame is flange back type which offers ease in mounting on the flat face of the wall. The back flange of the gate aperture frame shall be reasonably flat and drilled to engage with the anchor fasteners to be mounted on the wall. The uneven gap between the wall face and the back flange of the gate is to be sealed using grout during installation.

1. TYPES OF MOUNTING:

F. Mounting on the face of wall of a channel :



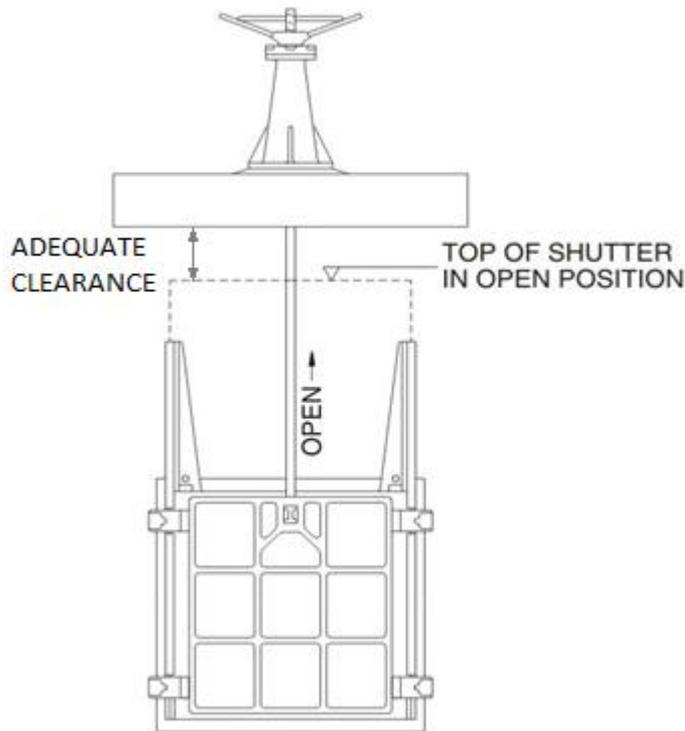
Exploded view showing face wall mounted open channel gate installed at the end of channel.



Exploded view showing side walls anchored open channel gate installed between two parallel side walls.

2. DIRECTION OF GATE OPENING:

A. Upward opening gate

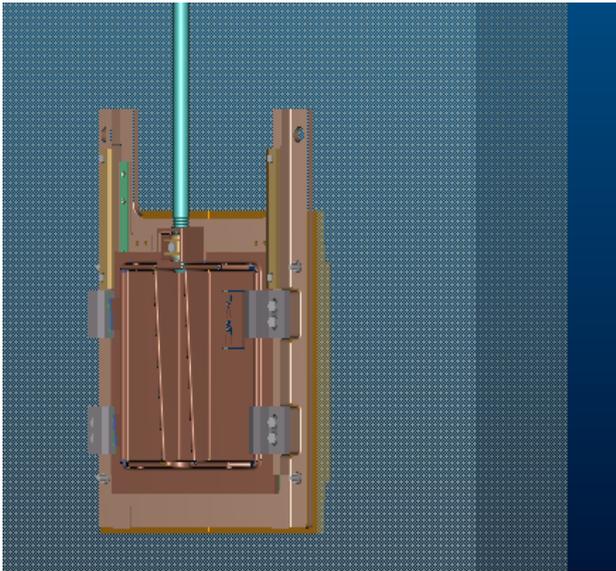


The sluice gates in which the shutter travels upwards to open in the side guides of frame extending above the gate frame opening are called upward opening gates.

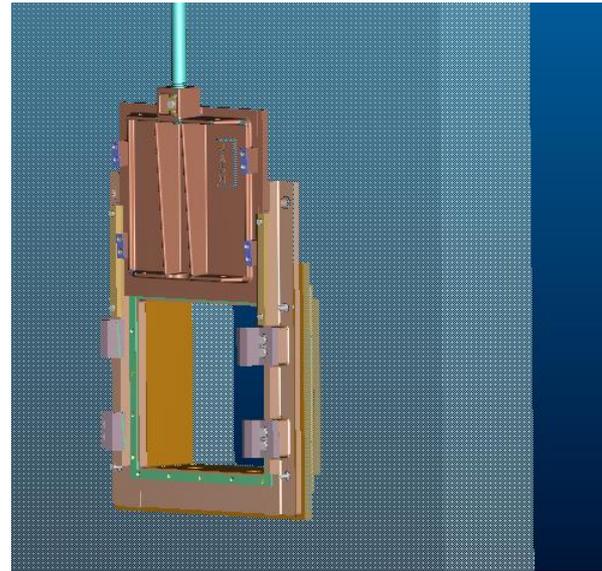
These gates are used where there is adequate clearance between the top of gate opening / aperture and the floor above the gate to enable the shutter to raise to open.

2. DIRECTION OF GATE OPENING:

A. Upward opening gate



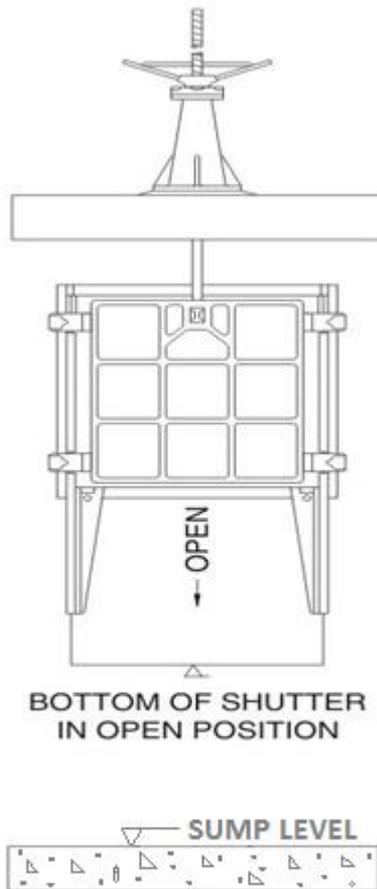
Upward opening gate in closed condition



Upward opening gate in open condition

2. DIRECTION OF GATE OPENING:

B. Downward opening gate



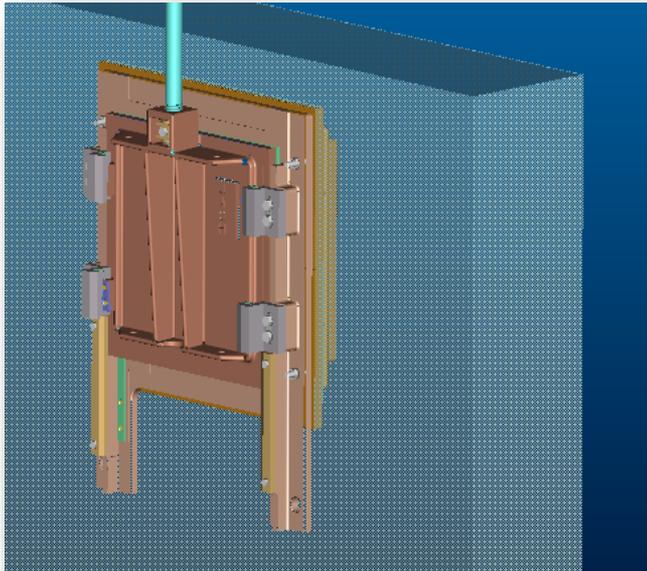
The sluice gates in which the shutter travels downwards to open in the side guides of frame extending below the gate frame opening are called downward opening gates.

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.

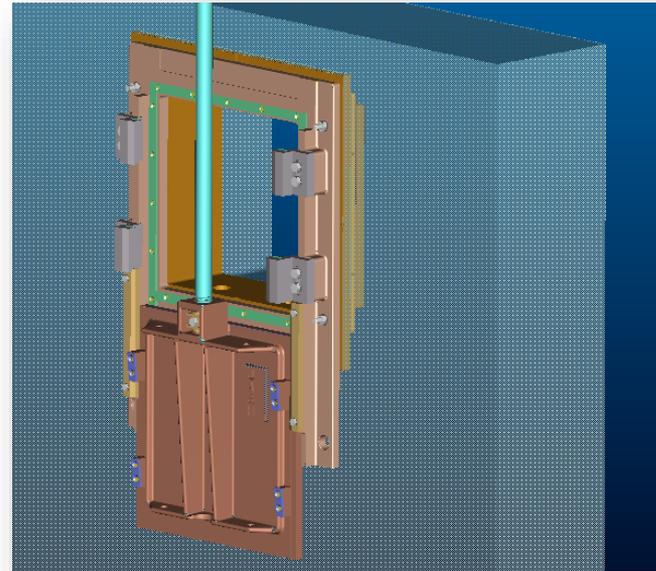
These type of gates can be used for decanting from a reservoir but not for precise level control. Hence these gates cannot be considered as being same as downward opening weir gates.

2. DIRECTION OF GATE OPENING:

B. Downward opening gate



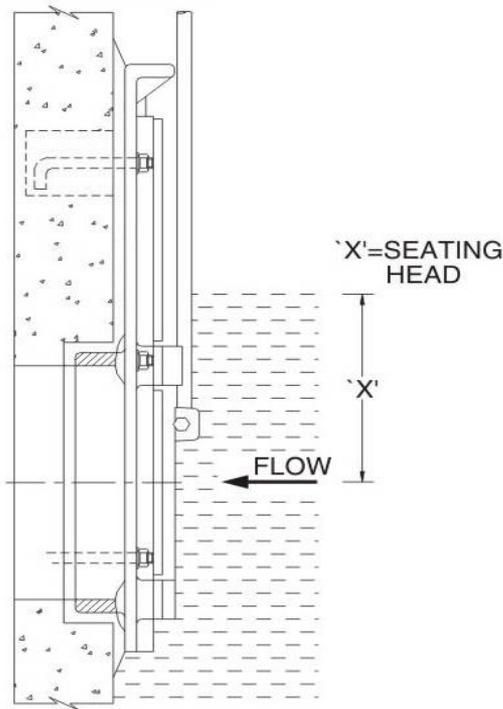
Downward opening gate in closed condition



Downward opening gate in open condition

3. TYPE OF WATER HEAD:

A. Seating / On-seating water head

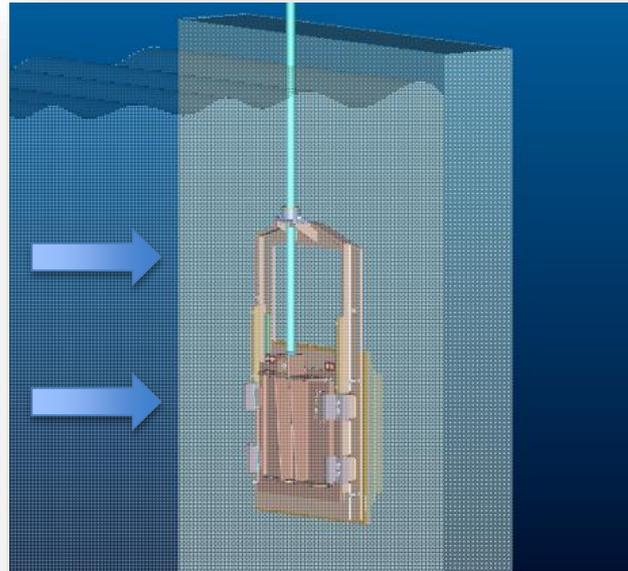


When the water pressure tends to press the door / shutter on to the gate frame then the type of water head is called seating / on-seating water head.

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

3. TYPE OF WATER HEAD:

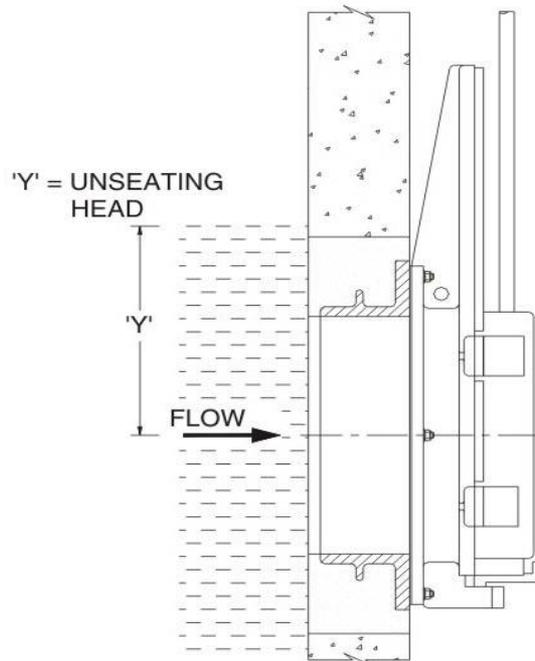
A. Seating / On-seating water head



Upward view showing water in front of gate pushing shutter on to the seat.

3. TYPE OF WATER HEAD:

B. Unseating / Off-seating water head



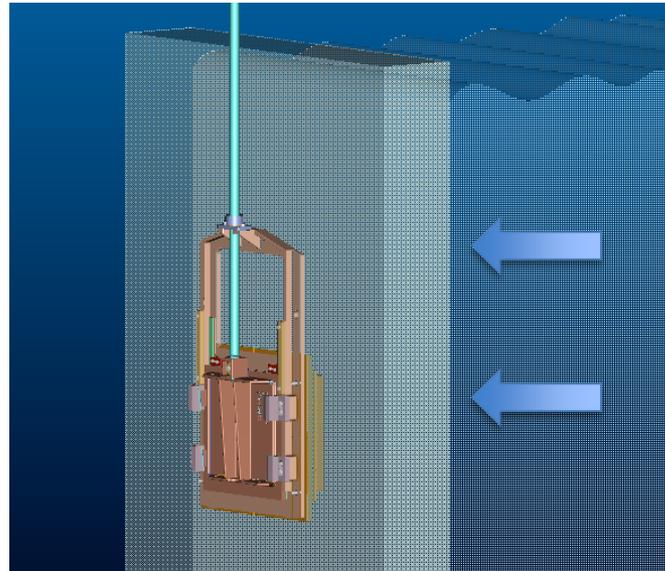
The water pressure tends to push the door/shutter away i.e. unseat from the gate frame then the type of water head is called unseating /off-seating water head.

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 are to minimize the outwards deflection of door / shutter at the top and / or bottom sealing edge and reduce the leakage.

3. TYPE OF WATER HEAD:

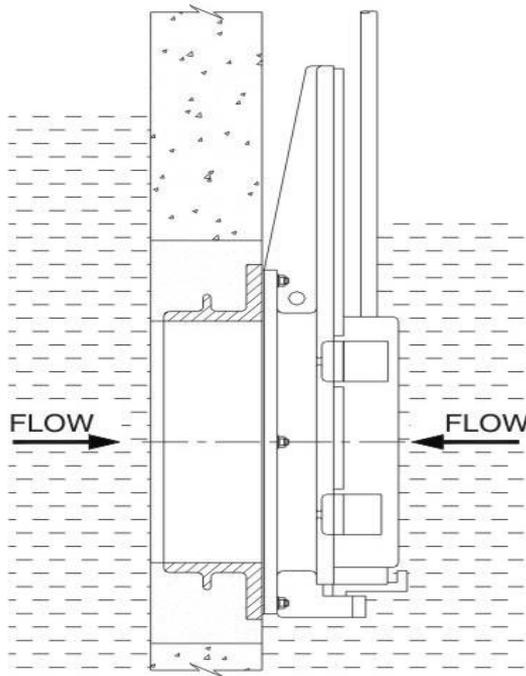
B. Unseating / Off-seating water head



View showing water behind the gate pushing the shutter away from the seat.

3. TYPE OF WATER HEAD:

C. Seating as well as unseating water head

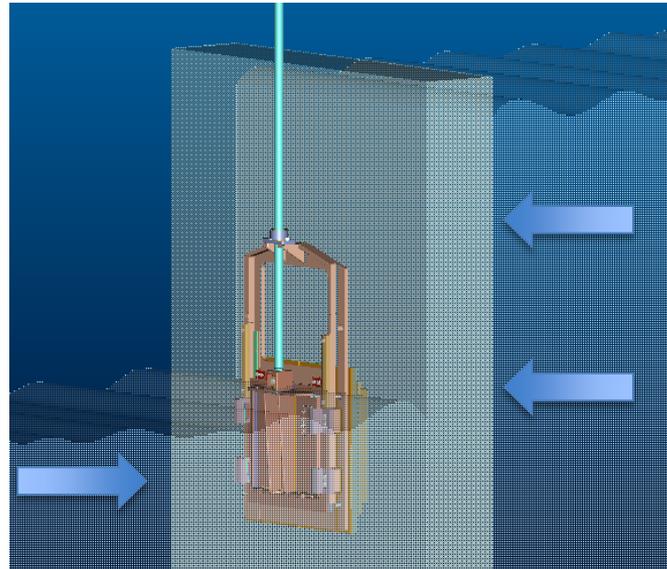


There may be situations in a particular gate installation, where the water pressure condition may be either seating or unseating at different points of time depending upon the net difference between the water levels on either side.

Such applications will necessitate a gate to be suitable for seating as well as unseating water head conditions.

3. TYPE OF WATER HEAD:

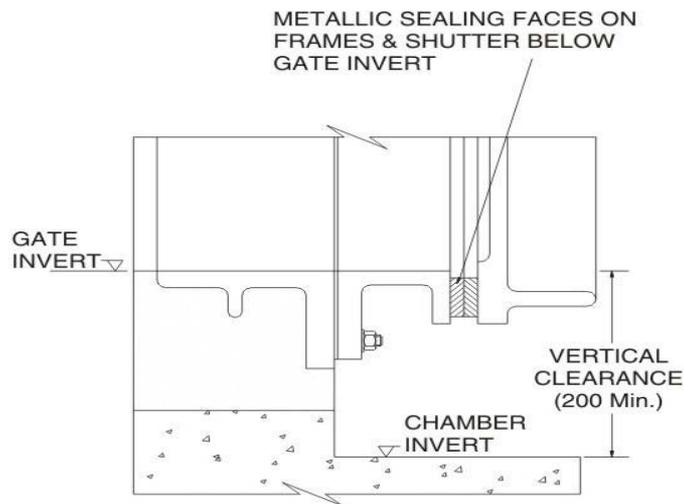
C. Seating as well as unseating water head



Upward view showing water on both sides of gate creating push or pull on the shutter depending upon the water level on each side.

4. TYPE OF BOTTOM CLOSURE:

A. Conventional bottom / Rebate invert type closure



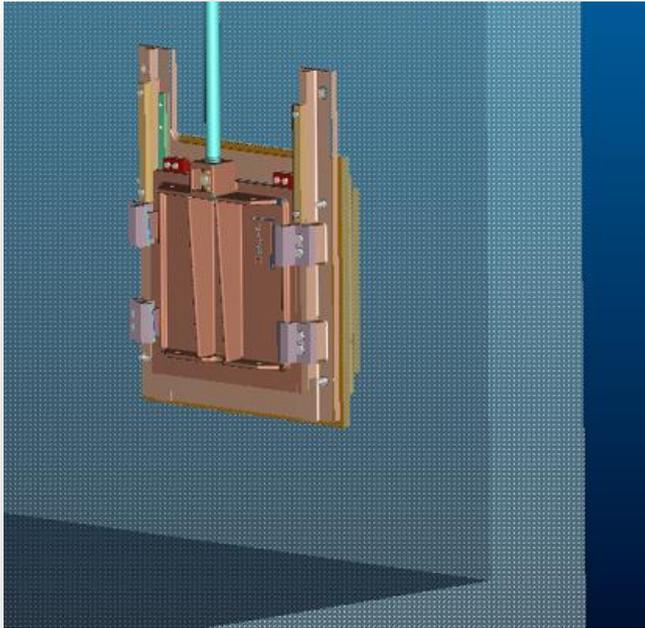
In case of conventional bottom / rebate invert type closing gates, water sealing at the invert of the gate is achieved by providing metallic sealing strips/ faces along the width of gate opening at the bottom of shutter as well as bottom of frame.

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.

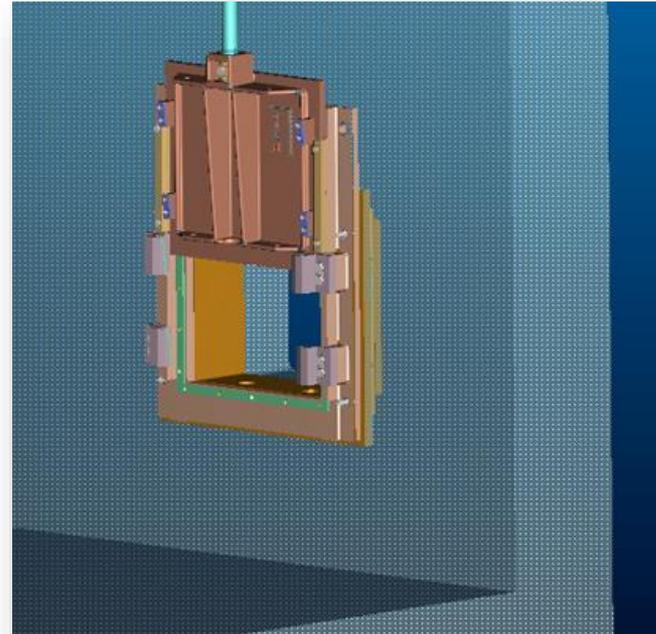
To enable mounting of such gates ample vertical clearance between the invert of gate and invert of chamber/channel is required. This vertical clearance in the form of a wall below the gate invert does not allow complete flushing of chamber, if needed. If this is acceptable then conventional bottom closing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

4. TYPE OF BOTTOM CLOSURE:

A. Conventional bottom / Rebate invert type closure



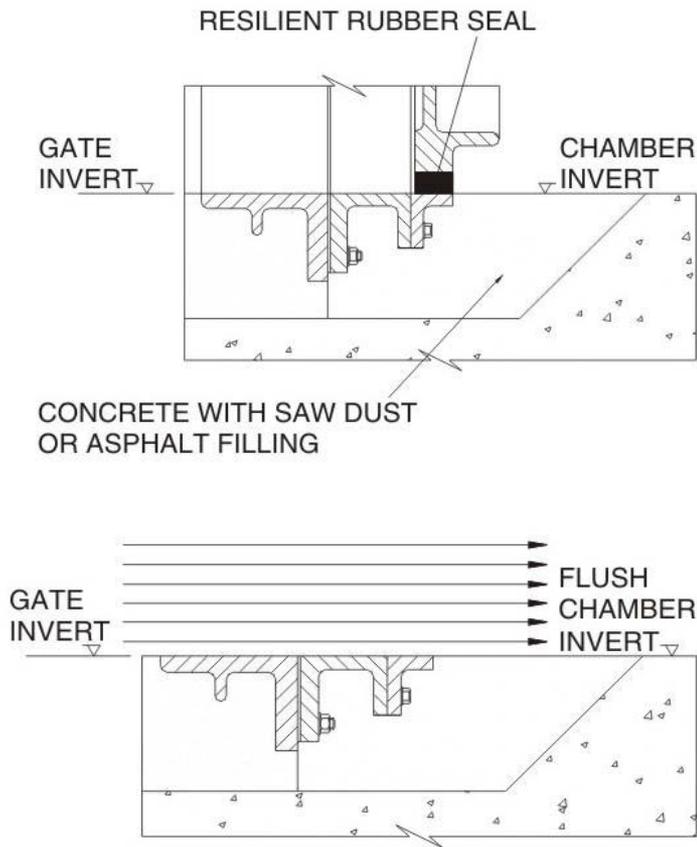
Conventional bottom closure gate in closed condition



Conventional bottom closure gate in open condition

4. TYPE OF BOTTOM CLOSURE:

B. Flush bottom / Flush invert closure:

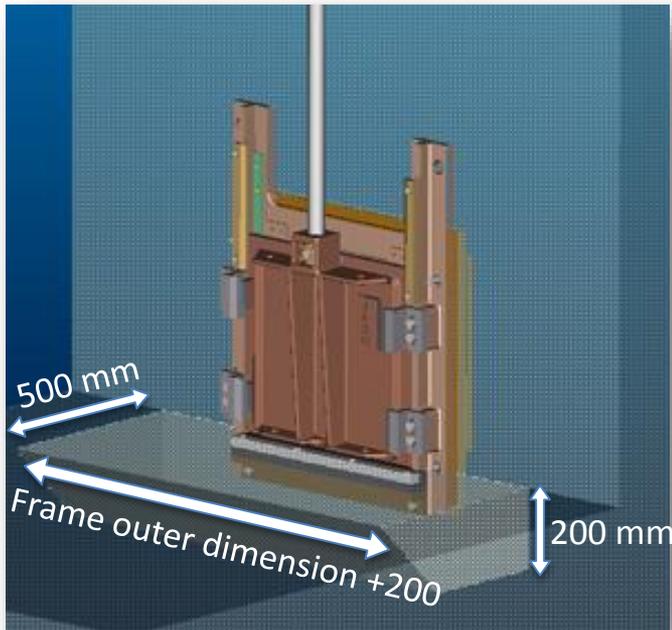


In cases where the invert of the gate and the channel floor are to be at the same level, or when complete drainage of the chamber is required, gates with flush bottom / flush invert closing are adopted.

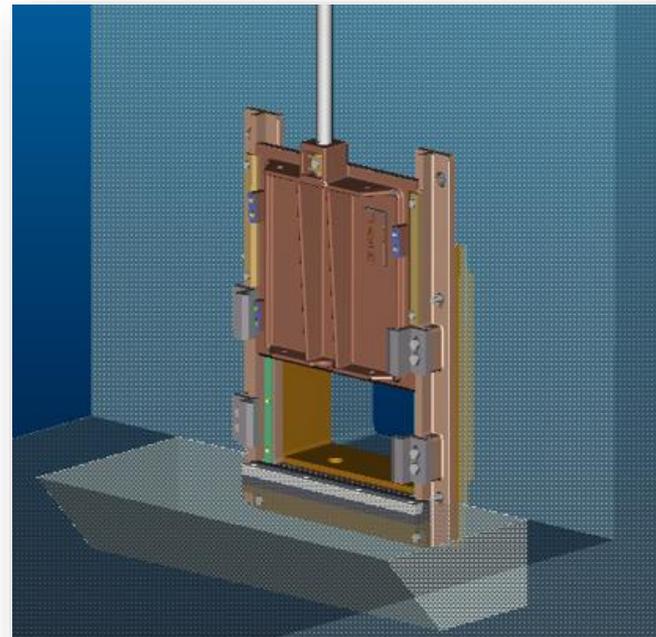
In case of flush bottom closing gates, water sealing at the bottom of gate is achieved by providing a resilient rubber seal pressing against a machined cast iron face, the contacting faces between the two being at the same level as that of the gate invert and chamber/channel floor.

4. TYPE OF BOTTOM CLOSURE:

B. Flush bottom / Flush invert closure:



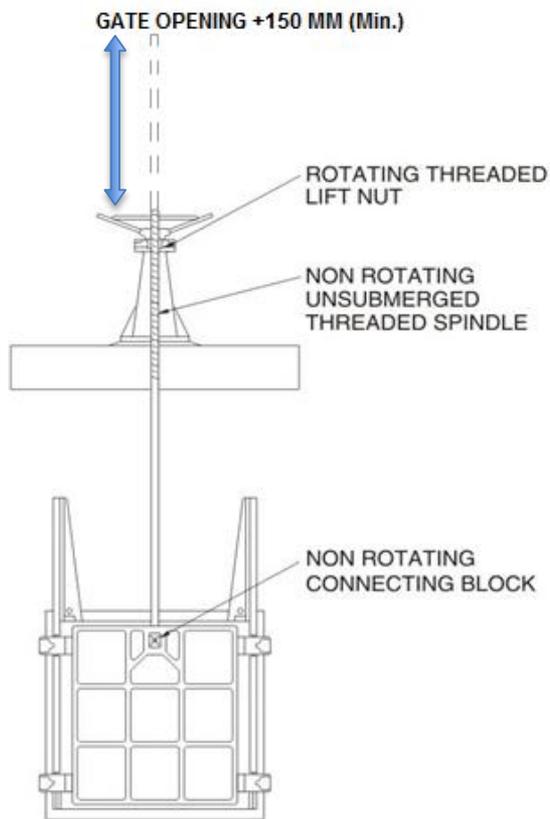
Flush bottom closure gate in closed condition



Flush bottom closure gate in open condition

5. TYPE OF SPINDLE MOVEMENT:

A. Rising spindle gates:

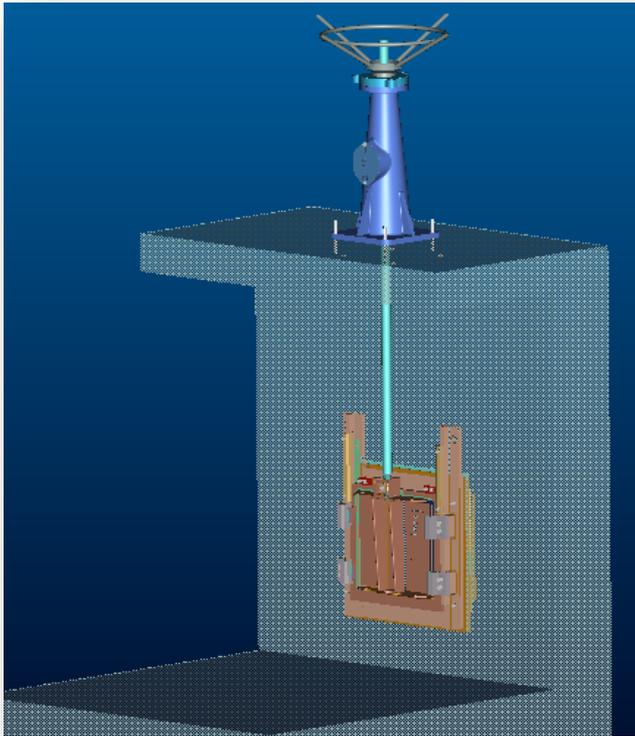


The sluice gates in which the spindle rises and lowers during upward and downward movement of shutter respectively while opening and closing of sluice gate are called rising spindle gates.

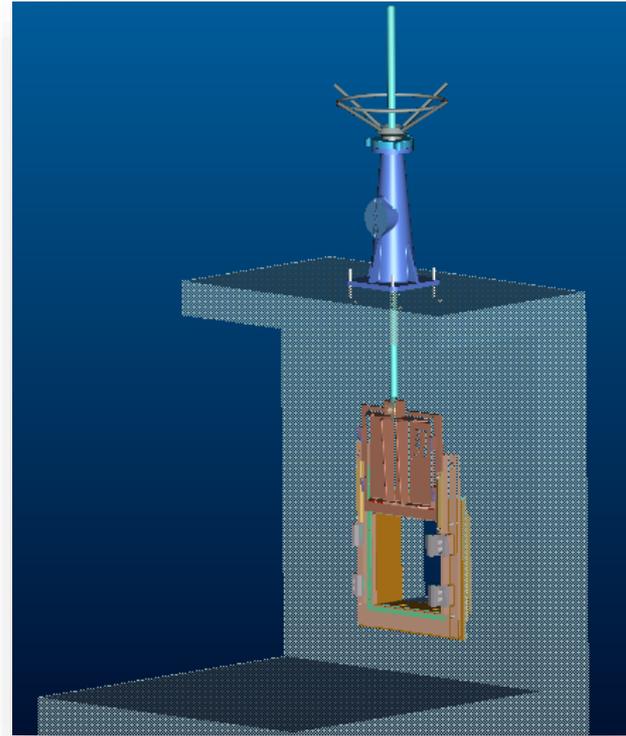
These gates have non-rotating spindle and rotating lift nut housed in lift mechanism which remains well above water level. Since the rotating lift nut and engaging threaded stem are above platform these can be regularly cleaned and lubricated. Moreover, the spindle extending above the lift mechanism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

5. TYPE OF SPINDLE MOVEMENT:

A. Rising spindle gates:



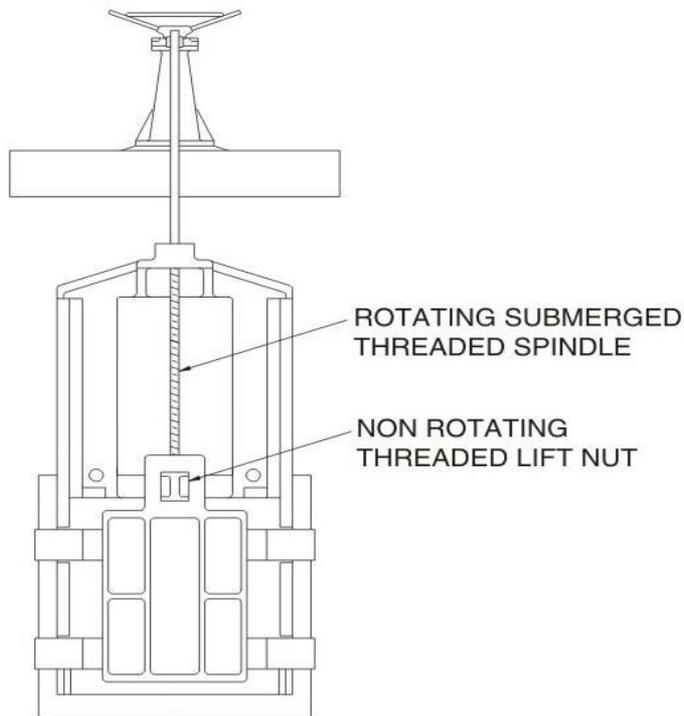
Rising spindle gate in closed condition



Rising spindle gate in open condition

5. TYPE OF SPINDLE MOVEMENT:

B. Non-rising spindle gates:



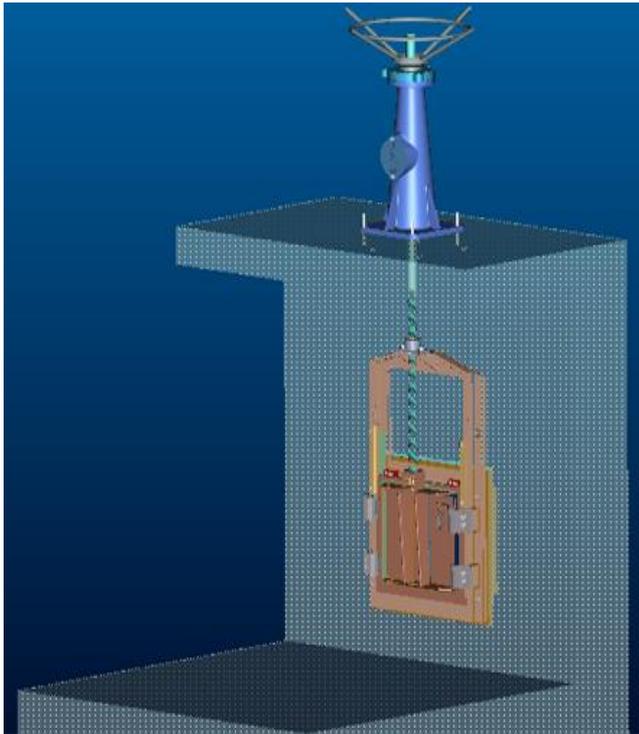
The sluice gates in which the spindle remain at the same position during upward and downward movement of shutter while opening and closing of sluice gate are called non- rising spindle gates.

These gates have rotating stem and non-rotating lift nut housed in a pocket at the top of shutter which remains submerged.

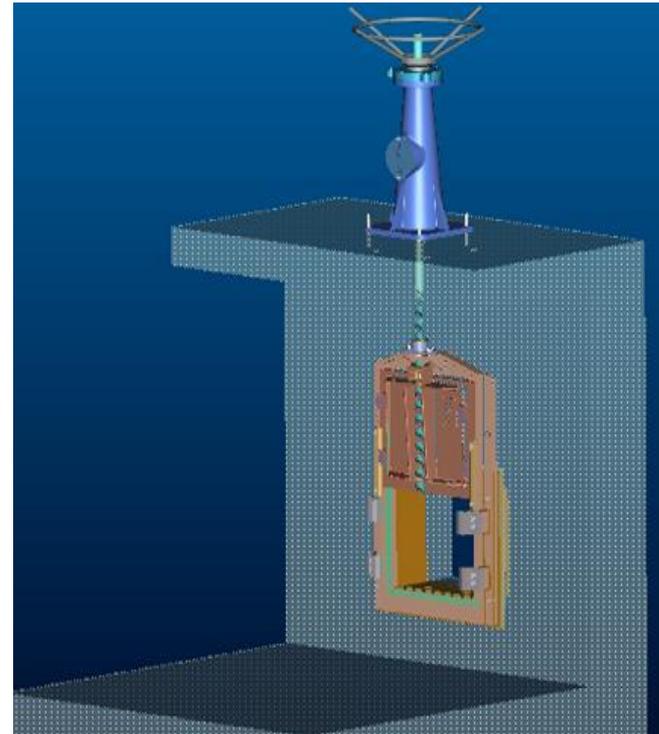
Since the threaded portion of stem and lift nut remain submerged, they remain exposed to damage and corrosion. Also regular cleaning and lubrication of such submerged parts is impossible. Moreover, debris or rubbish jamming in the spindle threads may create difficulty in gate operation. Hence use of non-rising spindle gates should be avoided wherever possible.

5. TYPE OF SPINDLE MOVEMENT:

B. Non-rising spindle gates:



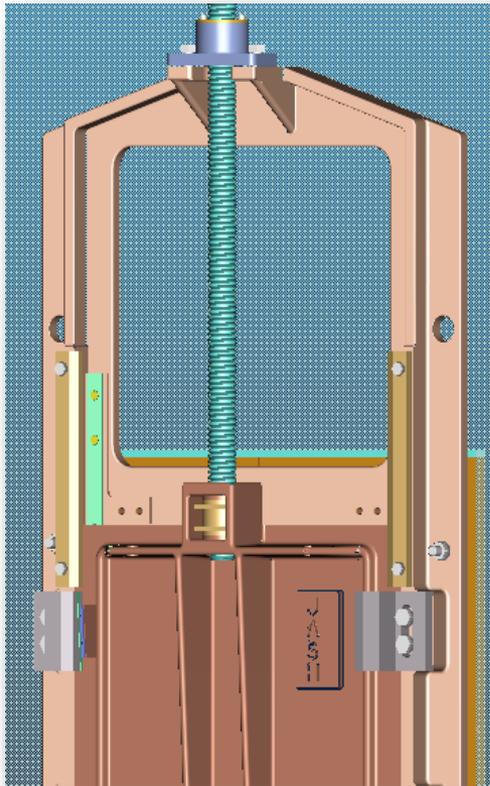
Non-rising spindle gate in closed condition



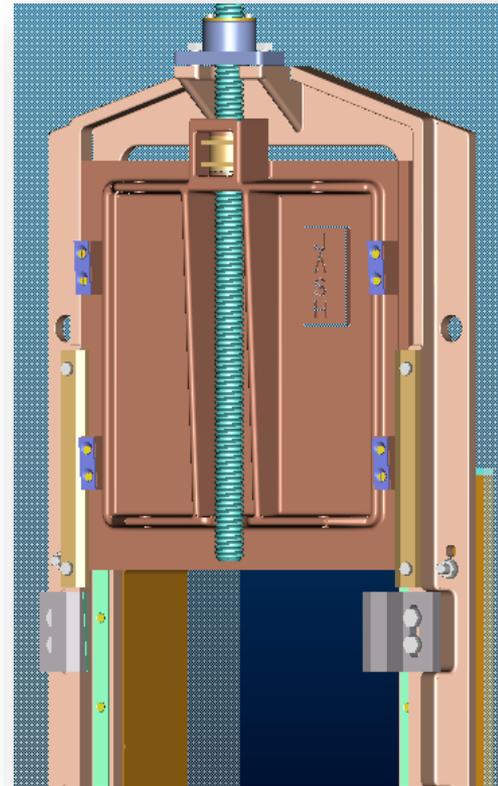
Non-rising spindle gate in open condition

5. TYPE OF SPINDLE MOVEMENT:

B. Non-rising spindle gates:



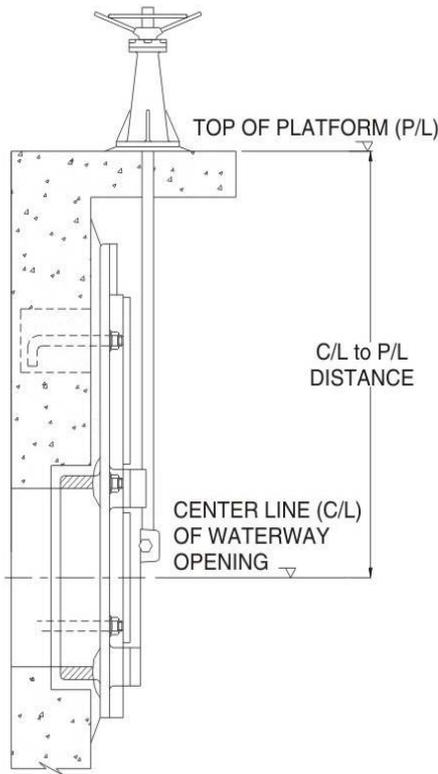
Non-rising spindle (closed top frame) gate in closed condition



Non-rising spindle (closed top frame) gate in open condition

6. MOUNTING POSITION OF LIFT MECHANISM & THRUST REACTION:

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



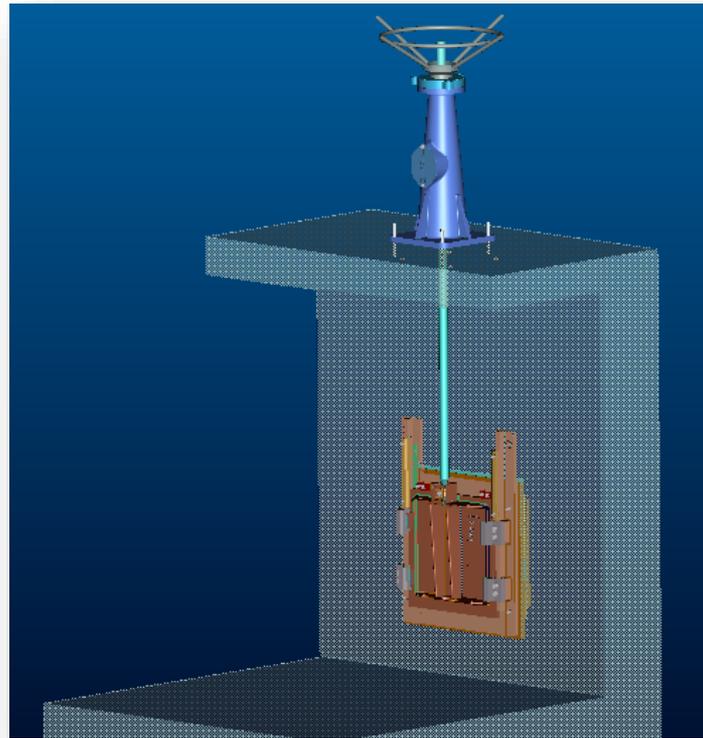
When the distance between center line of gate opening to top of operating platform is more than 2 times the height of gate opening then the operating headstock is generally mounted on a civil platform or a fabricated platform located above the gate frame. In this case the thrust reaction comes on the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

For such cases the gate frame can have short length extension guides to retain at least 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.

6. MOUNTING POSITION OF LIFT MECHANISM & THRUST REACTION:

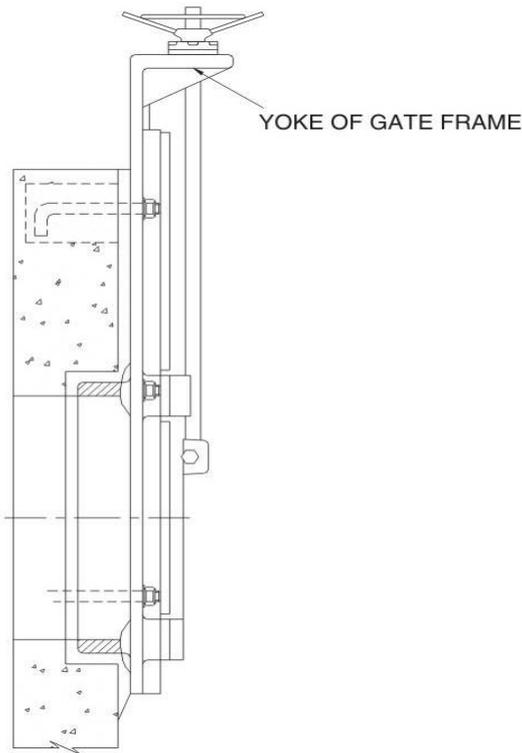
- A. Mounted separately on platform away from gate frame / Thrust platform:



View showing gate having open top frame with operating mechanism mounted on civil platform away from gate frame.

6. MOUNTING POSITION OF LIFT MECHANISM & THRUST REACTION:

B. Mounted directly on the frame of sluice gate / Thrust on gate frame:



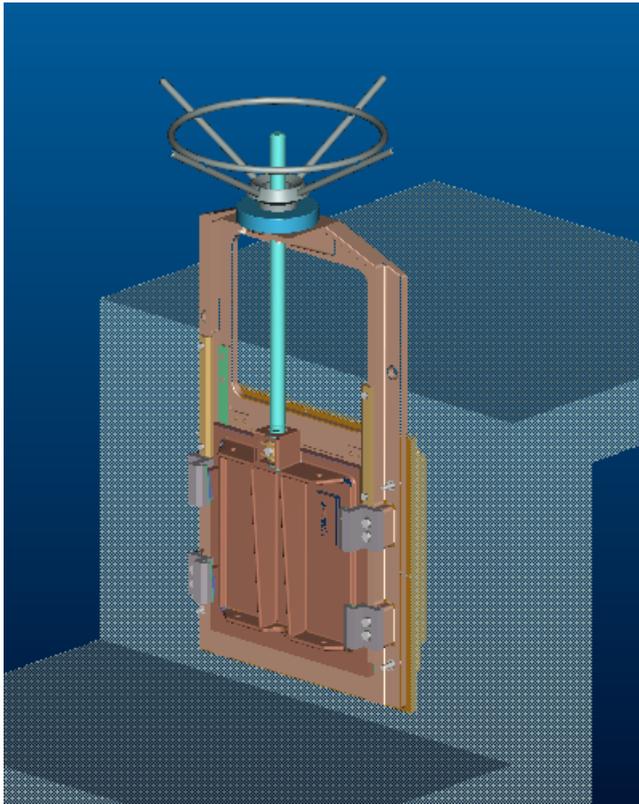
In some cases the gate frame is provided with full length extension guides to retain the vertical height of the shutter when the shutter is in the open position. The extension guides are then connected through a bridge / yoke which transfers the thrust coming from operating headstock on to the gate frame.

In such cases the thrust reaction comes on the gate frame and not on the platform.

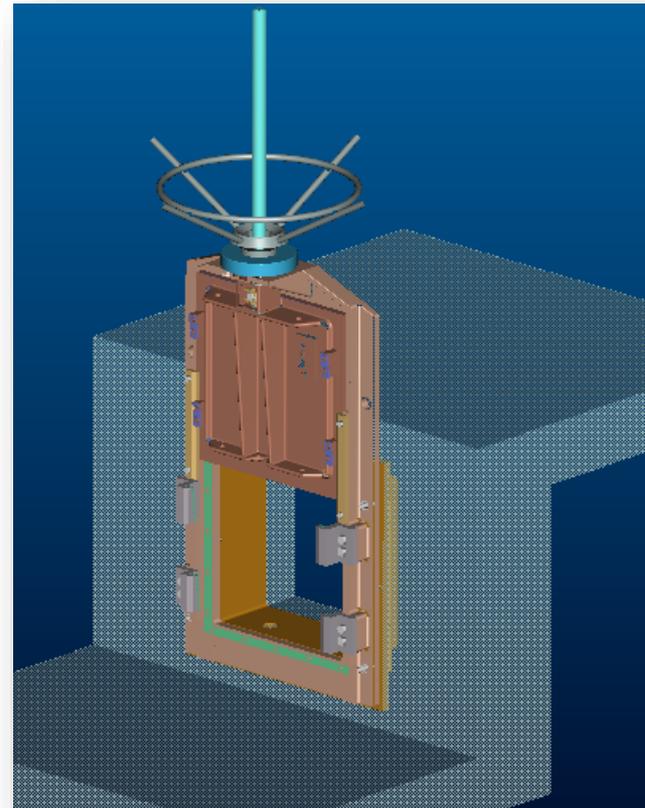
Such gate frames having full length extension guides with yoke are also called “Closed Top” frames and these types of sluice gates with the operating headstock mounted on the yoke of gate frame are called “Self Contained” sluice gates.

6. MOUNTING POSITION OF LIFT MECHANISM & THRUST REACTION:

B. Mounted directly on the frame of sluice gate / Thrust on gate frame:



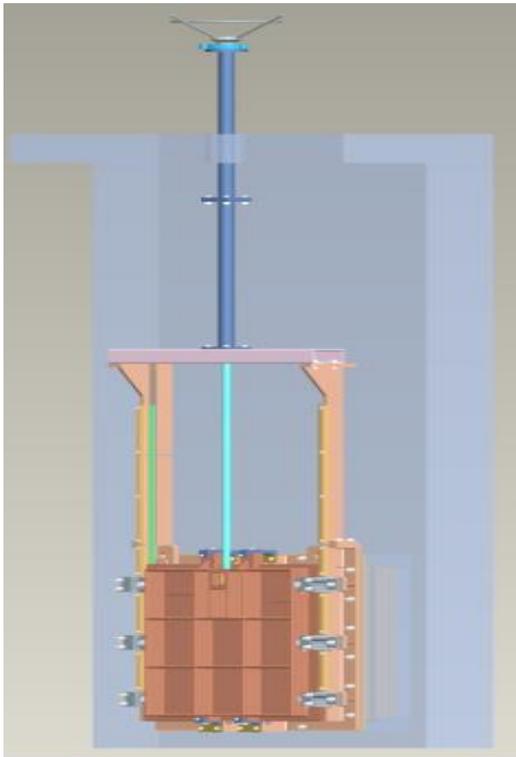
Rising spindle (closed top frame) gate in closed condition



Rising spindle (closed top frame) gate in open condition

6. MOUNTING POSITION OF LIFT MECHANISM & THRUST REACTION:

- C. Mounted separately on platform away from gate frame but thrust transferred on gate frame via thrust tube:

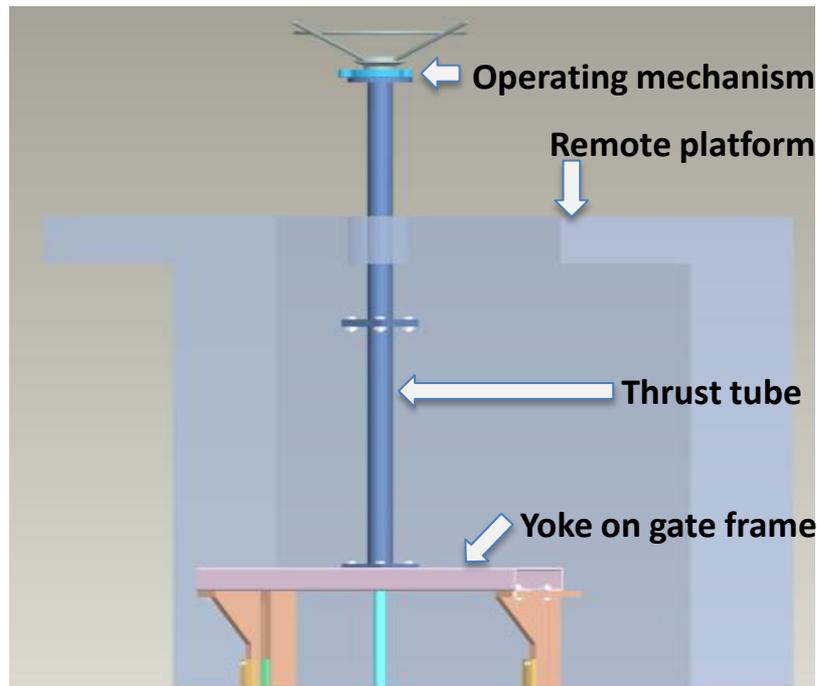


In some cases it is desired that the thrust reaction comes on the gate frame and not on the platform even though the operating mechanism is located well away from gate frame.

In such cases a thrust tube is provided in between the yoke of a closed top gate frame and operating arrangement.

6. MOUNTING POSITION OF LIFT MECHANISM & THRUST REACTION:

- C. Mounted separately on platform away from gate frame but thrust transferred on gate frame via thrust tube:



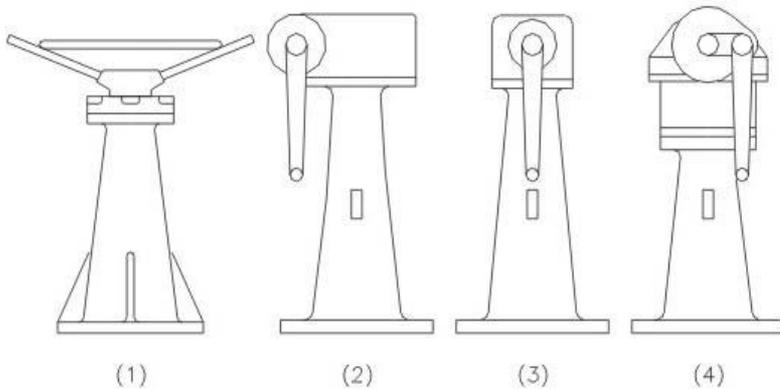
Close up view showing thrust tube mounted between yoke and operating arrangement mounted on platform

STANDARD ACCESSORIES



1. LIFT MECHANISM :

A. Manual operation:



(1) UNGEARED HEADSTOCK

(2) WORM GEARED HEADSTOCK

(3) BEVEL GEARED HEADSTOCK

(4) SPIRAL BEVEL GEARED HEADSTOCK
(TWO SPEED)

Manual operation of sluice gates is recommended where frequency of gate operation is low and when there is no constrain in time required for opening and closing of a gate or where access to the operating mechanism is difficult.

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.

1. LIFT MECHANISM:

A. Manually operation :

PUGH



(i) Ungeared Headstock:

Ungeared operating arrangement is provided when the lifting loads are low and easy gate operation without need of gearing is possible. These are easier to operate and offer fastest operation.

Features :

- Capable of operating the gate with an effort < 20 Kgs.
- Cast iron floor stand / pillar for convenient height.
- Pillar provided with window opening with removable cover to enable cleaning and greasing of spindle threads.
- Can be provided with a thrust bearing mounted non ferrous threaded stem nut engaging with spindle threads.
- Provided with arrangement for locking of the hand wheel to prevent unauthorized operation.

1. LIFT MECHANISM:

A. Manually operation :

PBGH-2000



PSBGH-5000



PSBGH-7000



(ii) Geared Headstock (Single Speed Type)

Geared operating arrangement is provided when the lifting loads are high and easy gate operation is not possible without gearing.

Features :

- Capable of operating the gate with an effort < 20Kgs.
- Cast iron floor stand / pillar for convenient height.
- Pillar provided with elliptical window opening with removable cover to enable cleaning and greasing of spindle threads.
- Provided with thrust bearing mounted non ferrous threaded stem nut engaging with spindle threads.
- Bevel or spiral bevel gear arrangement completely encased in housing to protect from atmospheric effects.
- Provided with arrangement for lubrication.

1. LIFT MECHANISM:

A. Manually operation :

PBGH-2004



(iii) Geared Headstock (Two Speed Type):

When the gear ratio required is higher than 1:7 a two speed geared headstock is essentially furnished.

The slower speed with high gear ratio is provided for initial crack opening of gate needing maximum torque.

PSBGH-5008/5012/5020



PSBGH-7035/7050



The faster speed with low gear ratio is provided for further opening after the gate is initially crack opened.

1. LIFT MECHANISM:

B. Electrical operation:



Electrically operated lift mechanism is provided for faster gate operation or for automation requirement.

These comprise of standard electric actuators manufactured by Rotork / Auma / others mounted on floor stand / pillar.

These actuators enable gate operation between 250-300 mm /minute and are rated for opening or closing of a gate within 15 minute.

The actuators are provided with manual override facility to manually operate the gate in event of electric failure or malfunction.

1. LIFT MECHANISM:

C. Pneumatic operation:



Pneumatically operated lift mechanism is provided where very fast opening and closing is desired or where fail safe condition is required.

This comprise of double acting pneumatic cylinder which pulls the shutter to open and pushes to close via 3/2 or 5/2 or 5/3 solenoid valve.

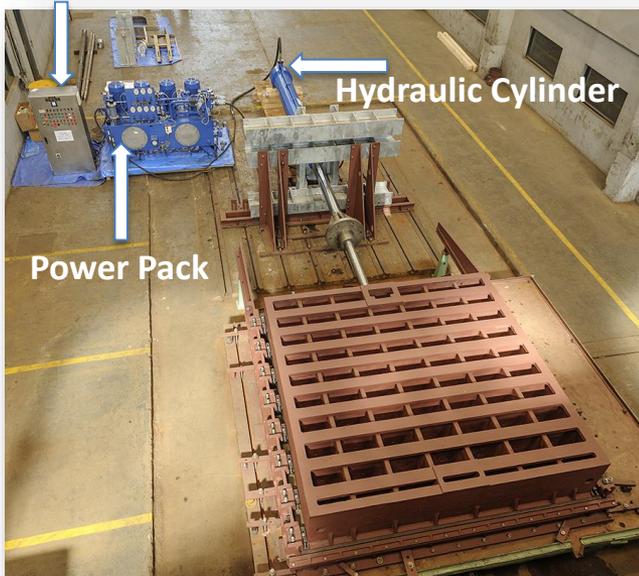
The pneumatic actuating system is generally designed for operating at air supply pressure of 5 bars.

In event of failure in air supply an easily engageable override arrangement is provided to manually operate the gate.

1. LIFT MECHANISM:

D. Hydraulic operation:

Control Panel



Hydraulic operation of sluice gate is recommended when faster closing of the gate in emergency is required or where fail safe condition is required.

This comprise of single ended double acting cylinders for opening & closing the door and hydraulic power pack unit.

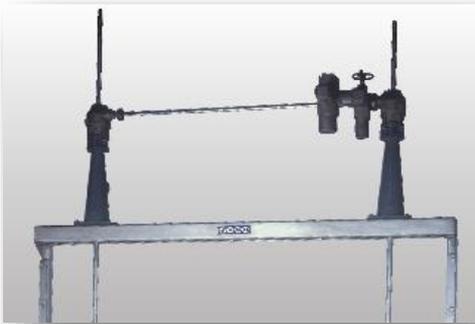
Hydraulic operating arrangement is generally designed at 210 bar pressure.

In event of failure in electric supply, override arrangement can be provided to operate the gate using accumulators



1. LIFT MECHANISM:

E. Tandem operating arrangement:



Twin lifting or tandem operating mechanism is provided for gates having width of opening greater than twice the height of opening.

Twin lifting mechanism are connected by tandem shaft for simultaneous operation of gates.

Twin lifting mechanism are expensive and involve precision in installation and are not recommended until required technically.

Larger size of gate does not necessarily require tandem operating mechanism.



2. STEM / SPINDLE:



Stem / spindle is provided to raise or lower the gate.

Single piece or multi-piece spindle is provided, as required, to connect the shutter with the lift mechanism.

The spindles are generally provided with square threads.

The length of thread provided for non self contained gates is kept 300 mm more than the height of gate opening to take care of any variation in the platform location.

3. STEM GUIDES:

A. Fixed center type stem guides:



Stem guides are provided to prevent buckling of long stems due to over-closure.

These are provided when the distance of the centerline of spindle from the face of wall is less than 175 mm.

These are directly mounted on face of wall using anchor bolts.

The stem guides have machined bore split journal to facilitate erection.

3. STEM GUIDES:

B. Adjustable type Stem guides:



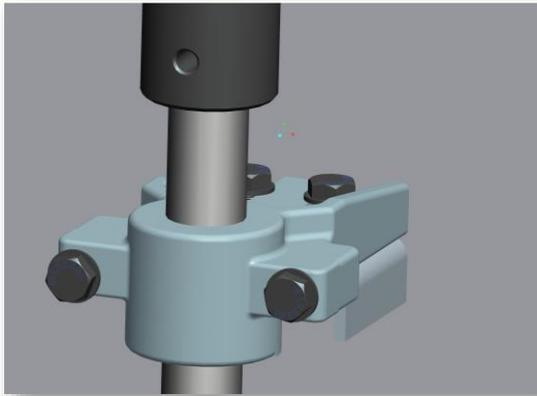
These are provided when the distance of the centerline of spindle from the face of wall is more than 200 mm.

These comprise of a right angled bracket to be secured on the face of wall with anchor bolts and an adjustable guide which can be secured on the horizontal face of the right angles bracket.

This stem guide is adjustable in a direction perpendicular to face of wall and have machine bored split journal to facilitate erection.

3. STEM GUIDES:

C. Channel type Stem guides:



These are provided when the distance of the centerline of spindle from the face of wall is more than 150 mm.

These comprise of a C shaped fabricated bracket to be secured inside the pocket provided in the wall with secondary grout and an adjustable guide which can be secured on the horizontal face of channel.



Top view



Bottom view

4. COUPLINGS:



Couplings are provided to couple / connect small lengths of stem when stems are to be longer than four to five meters.

These have internal threads engaging with threads provided on spindle.

These are provided with pins passing through it and the engaging spindles for locking.

5. SAFETY STOP NUT:

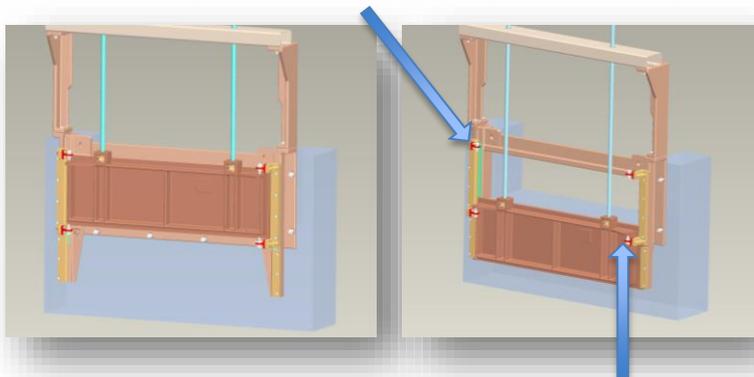


Safety stop nut is provided on threaded rising stems of manually operated gates to prevent chances of over closing of gate and thus to avoid chances of damage to wedge blocks, stem and the operating platform.

The safety stop nut is provided with internal threads to engage with spindle threads.

It is furnished with a set screw for setting it in a fixed position after the gate is installed.

Safety Stops in case of Weir gates to prevent excess opening



Safety Stops in case of Weir gates to prevent over travel

OPTIONAL ACCESSORIES



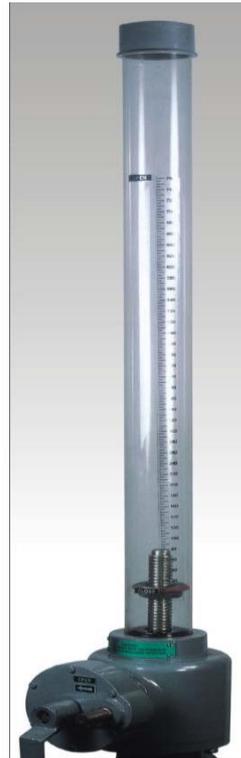
1. PIPE HOOD / STEM COVER:



Pipe hood / stem cover is provided on headstock of rising spindle gates to protect spindle threads from dirt, dust and weather.

Pipe hood are offered in steel or transparent plastic (polycarbonate / acrylic) material.

2. LOCAL GATE OPENING / CLOSING INDICATION (FOR MANUALLY OPERATED GATES):



Gate opening indication arrangement is provided on rising spindle gates to indicate “OPEN” or “CLOSE” position of gate.

Opening indication arrangement comprise of pipe hood with a indicator scale and a spindle mounted indication nut moving adjacent to the scale for open / close indication.

Pipe hood is offered in steel or transparent plastic (polycarbonate /acrylic) material.

Indication arrangement can be provided with a scale having 1 cm graduation to show the extent of gate opening.

3. REMOTE GATE OPENING / CLOSING INDICATION (FOR MANUALLY OPERATED GATES):



Remote indications of gate opening arrangement is provided on rising spindle gates to indicate “OPEN” or “CLOSE” position of gate at remote position in control room.

Opening indication arrangement comprise of GI pipe hood with a indicator scale, a spindle mounted indication nut moving adjacent to the scale for open / close indication and limit switches at the ends.

Pipe hood is offered in GI pipe material only to facilitate the mounting of limit switches..



4. FOOT PLATE WALL BRACKET:



Foot plate wall bracket is provided to support headstock pillar in cases where projecting civil platform is not available for mounting of headstock.

The bracket is secured to the vertical face of the wall using anchor bolts and the pillar is then secured on the horizontal face of bracket using bolts and nuts.



The bracket has to be designed to take the operating thrust coming from gate.

5. OFFSET CENTRE PILLAR:



Offset center pillar is used in lieu of foot wall bracket and headstock pillar in cases where projecting civil platform is not available.

The foot of the pillar is secured to the horizontal face of the vertical wall using anchor bolts.

The top portion of pillar has an offset bracket which enables mounting of bench type operating mechanism on it for gate operation. The height of this pillar is so kept that a person can easily operate the gate while standing on floor.

6. PORTABLE OPERATOR:

A. Portable Trolley mounted electric operator:



Portable electric operator is provided for faster opening of manually operated gates. A common portable operator can be used for operation of a number of gates of different sizes located near each other.

The operator is trolley mounted for ease in transportation from one location to another and for local movement at particular location.

6. PORTABLE OPERATOR:

B. Portable engine driven operator:



Portable engine driven actuators are provided to operate the gates in event of power failure for electric operated gates. This actuation system is the final solution to all those problems related to sluice gates that cannot be electrically fed, and therefore represents a true alternative to electric actuation system.

This can also be used for manually operated gates for faster operation of opening / closing.

6. PORTABLE OPERATOR:

C. Portable battery driven operator:



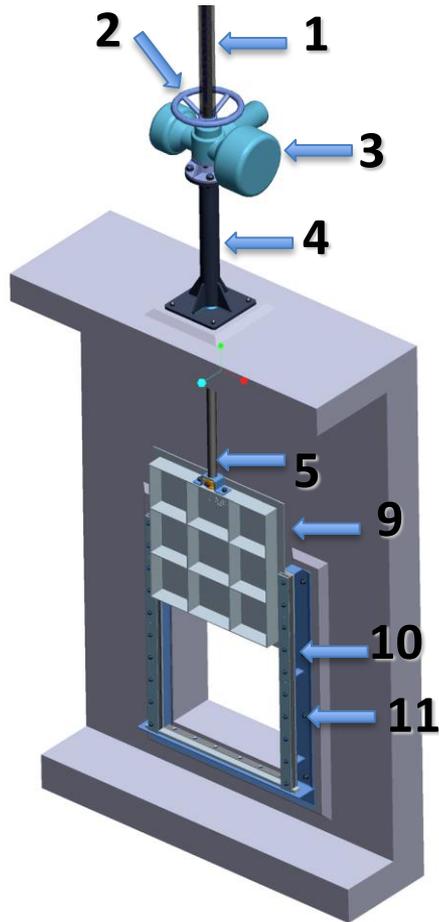
Portable battery driven actuators are provided to operate the gates in event of power failure for electric operated gates.

This can also be used for manually operated gates for faster operation of opening / closing.

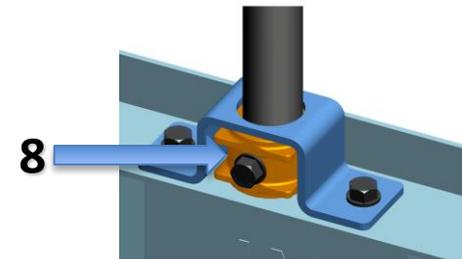
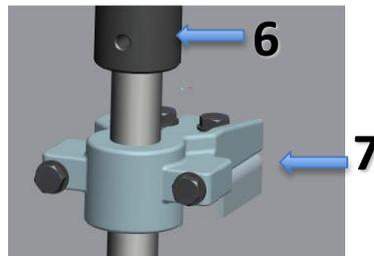
OPERATION & MAINTENANCE



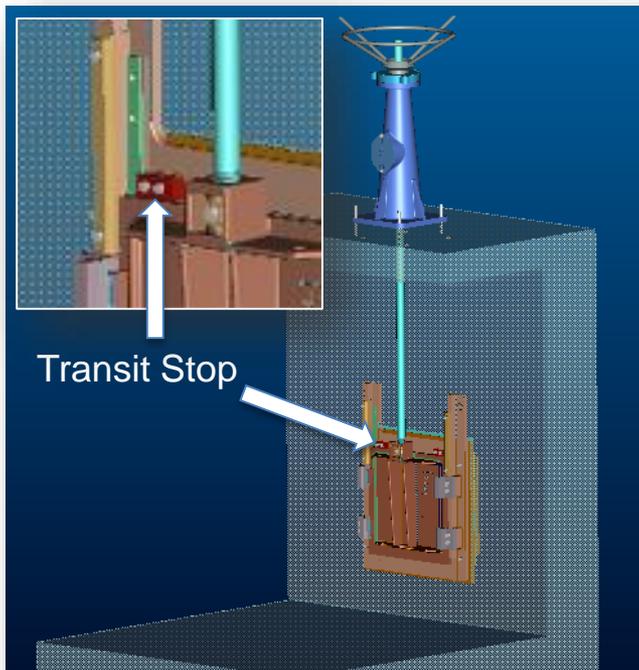
SLUICE GATE TERMINOLOGY:



1. Stem cover
2. Hand wheel
3. Electric Actuator
4. Pillar
5. Stem / Spindle / Lifting Rod
6. Coupling
7. Stem guide bracket
8. Thrust nut
9. Shutter
10. Frame
11. Anchor fastener

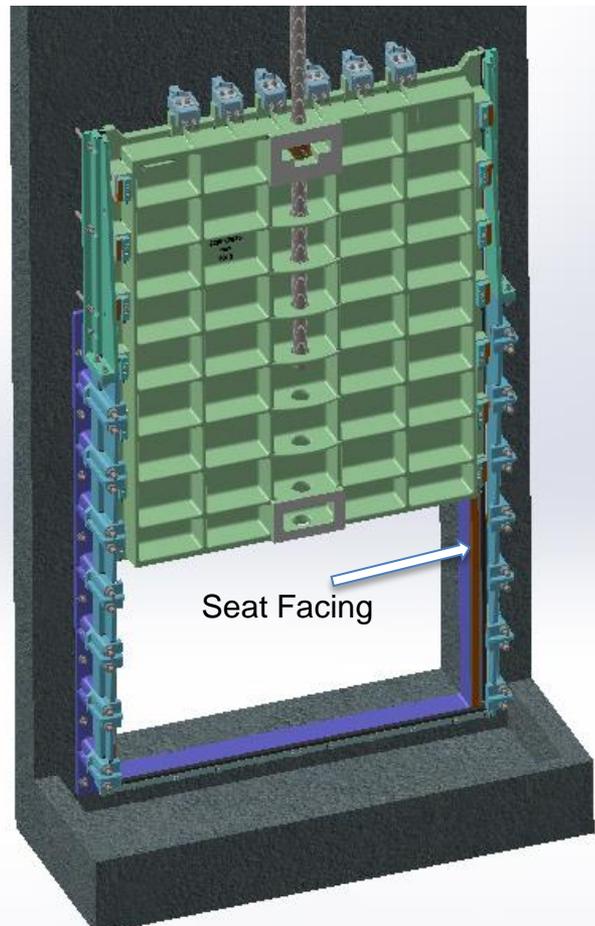


INITIAL OPERATION OF GATE AFTER COMPLETION OF INSTALLATION:



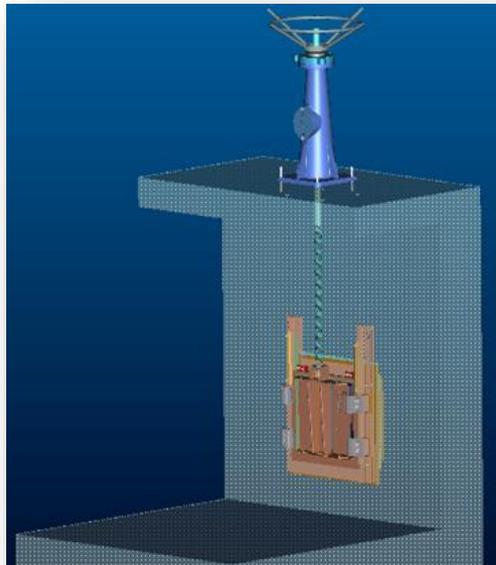
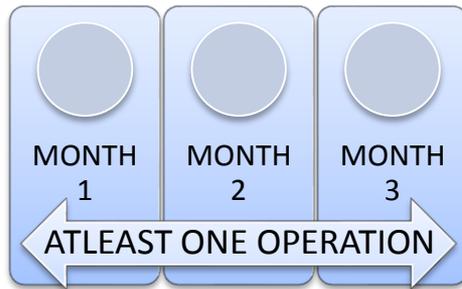
- Remove the lock plates on the gate assembly before operating the gate.
- Clean the gate assembly thoroughly well. Remove all foreign matter, paint, sand, concrete droppings, debris etc. from the seat facing, wedging and sliding surfaces, gate guides, wedge blocks , bottom sill of gate and the invert. Every possible care should be taken to ensure that the seat-facings are neither scratched nor damaged in any way otherwise the gate cannot be expected to be adequately water-tight.

INITIAL OPERATION OF GATE AFTER COMPLETION OF INSTALLATION:



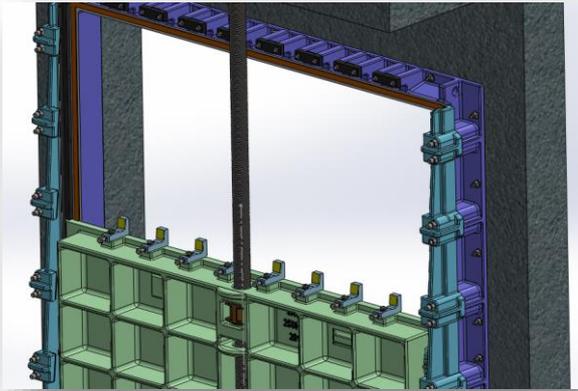
- Thoroughly clean the lifting rod and lubricate with a high grade heavy duty grease.
- Operate the gate slowly and carefully from fully closed position to fully open position to check for unobstructed and smooth operation of gate as well as headstock.
- After the gate is fully opened, check seat facings & guides and clean any foreign matter like paint, concrete etc. Apply light grease to the seat facings and wedges before closing the gate.

MAINTENANCE INSTRUCTIONS:



- The gate should be operated at least once in every three months. If this is not done then jamming of gate may occur.
- The lifting rods of all headstocks should be cleaned and greased at least once every six months. The frequency of cleaning and greasing the lifting rod should be increased if the greased is observed to become dirty faster.
- The thrust bearings and gears of manually operated headstocks should be lubricated with heavy duty grease at least once a year.
- In case gates are provided with mechanized actuating mechanism then maintenance of mechanized actuating mechanism should be done as per instructions of the mechanism manufacturer.

MAINTENANCE INSTRUCTIONS:

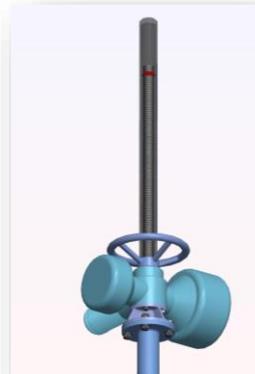


Non-rising downward opening gate

- Rising spindle gates do not require periodic maintenance.
- Non rising spindle gates require periodic attendance and maintenance. Spindle threads of non rising spindles remaining submerged may get coated with dirt and grit. This wears out the threads of the spindle nut faster. The spindle nut should be thoroughly checked at least once every six months and should be replaced if excessive wear is noticed.

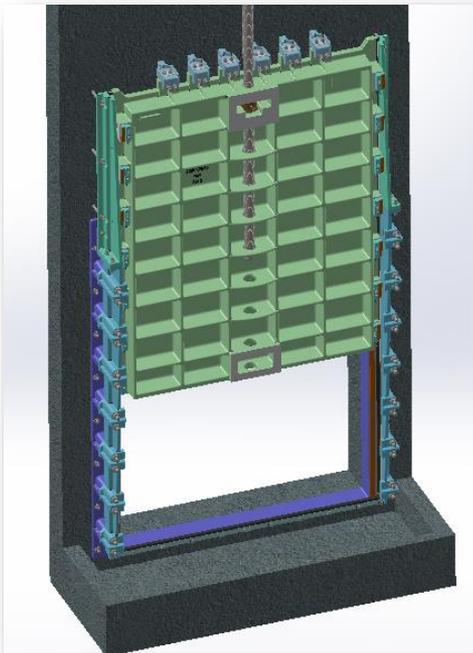


Non-rising upward opening gate

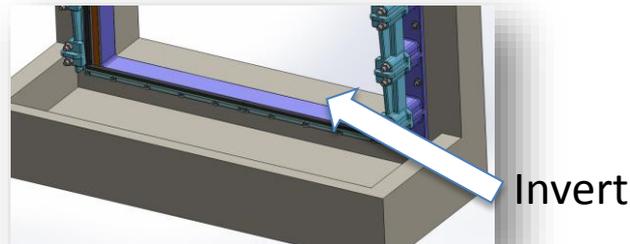
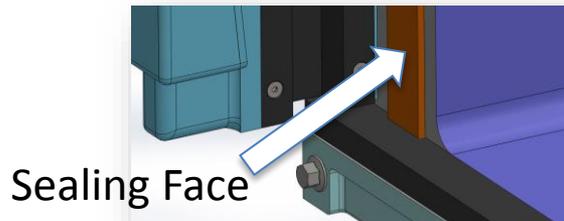


Rising spindle

DO'S:

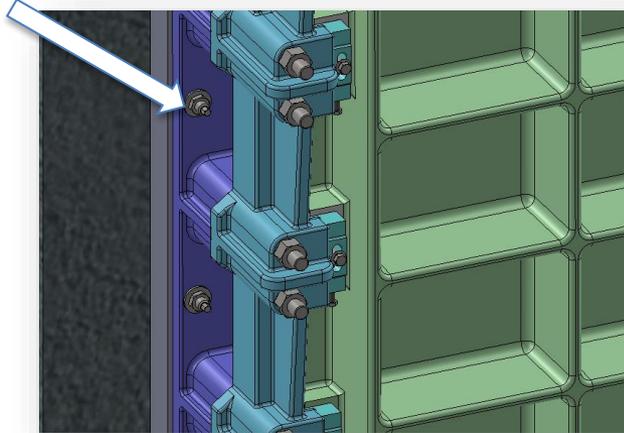


- Before Sluice Gates are put into regular service or after being left standing for any considerable length of time the gate shutter should be raised and all foreign matter carefully removed from the faces, guide grooves and the invert area.
- The sealing faces, wedge faces, screwed stems and any other machine parts should be well greased.
- All sluice gates should be operated at least once every three months if the shutter as well as guides are not provided with non-seizure liners.



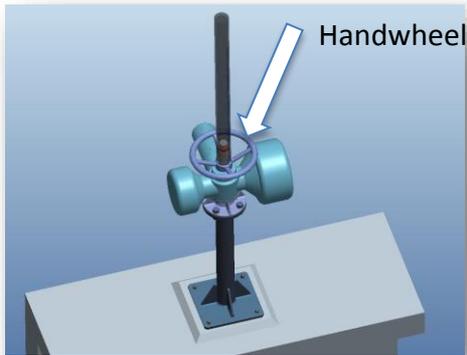
DO'S:

Foundation Bolts

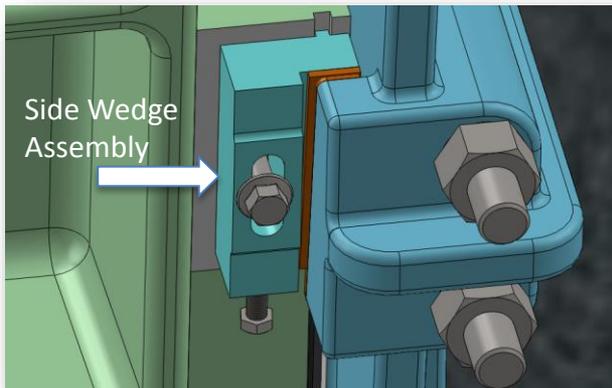


- The nuts of all constructional and foundation bolts should be checked for tightness every twelve months.
- If the sluice gate is installed in situations where debris or foreign matter can build up it is recommended that the sluice gate be periodically cleaned off.
- The protective paint should be examined every six months for signs of damage.
- For rising stem units, with the gate in the fully raised position, one should have the screw thread cleaned, inspected for wear and re-greased every six months.

DONT'S:



- Do not remove lock plates until and unless the gate is installed and is to be initially operated.
- Do not over torque the crank handle / hand wheel.
- Do not disturb the adjustment of wedge block bolts/studs.



TROUBLE SHOOTING AT SITE



TROUBLE SHOOTING AT SITE:

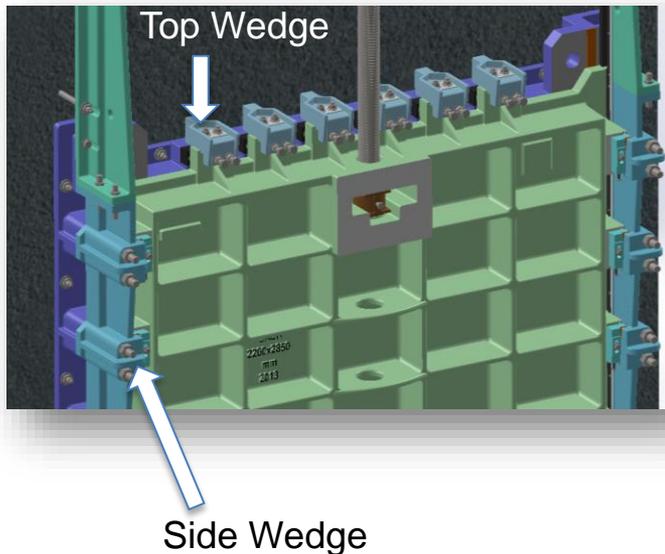
There are a number of problems that can arise with gates at site. The most commonly arising problems are :

- 1) Leakage
- 2) Noise
- 3) Difficulty in gate operation
- 4) Problems related to stem

The causes due to which these problems arise and their remedies are explained hereunder.

TROUBLE SHOOTING AT SITE:

Problem 1. Leakage:



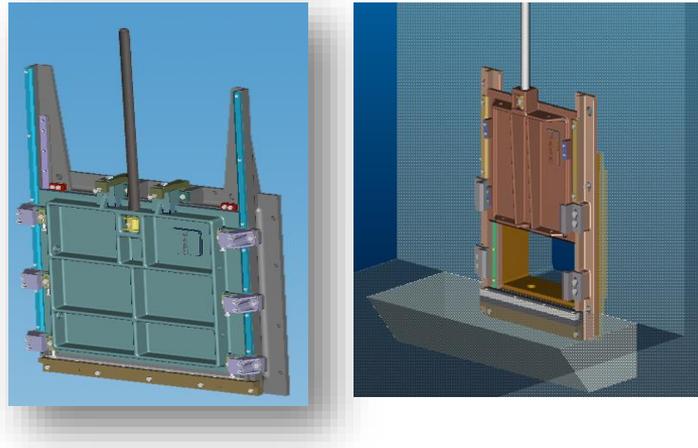
Cause – a : Leakage due to wedge setting disturbance during transportation, handling and installation or due to any other reason.

Remedy : If the erection has been done correctly and properly, without twisting and distorting the frame in case of wall mounting gates or without twisting and distorting the wall thimble in case of wall thimble mounted gates , then proper adjustment of the wedges will most often correct this leakage problem.

Hence before requesting a site visit, the contractor should adjust the wedges and recheck the leakage performance. Procedure for wedge adjustment is given in Installation, operation & maintenance manual.

TROUBLE SHOOTING AT SITE:

Problem 1. Leakage:



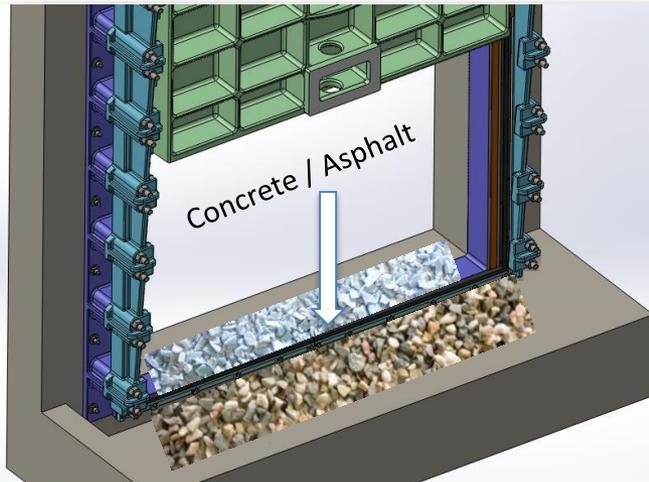
Cause – b: Leakage due to Paint / civil debris / foreign substance on seat facing or sealing area. This can occur during installation or carrying subsequent civil works and finish painting after gate installation.

Remedy: First check the seat facing on the top side by looking over the top of the gate. If there is paint or other foreign substance on the seat facings of frame and shutter then this should be cleaned. Thereafter raise the gate so that the seat facings on the frame as well on the shutter can be examined. If anything is sticking on the seat facings / sealing surface then scrape and remove the same without damaging the surface.

After cleaning the seat facings / sealing area it may be sometimes necessary to reset the wedges.

TROUBLE SHOOTING AT SITE:

Problem 1. Leakage:

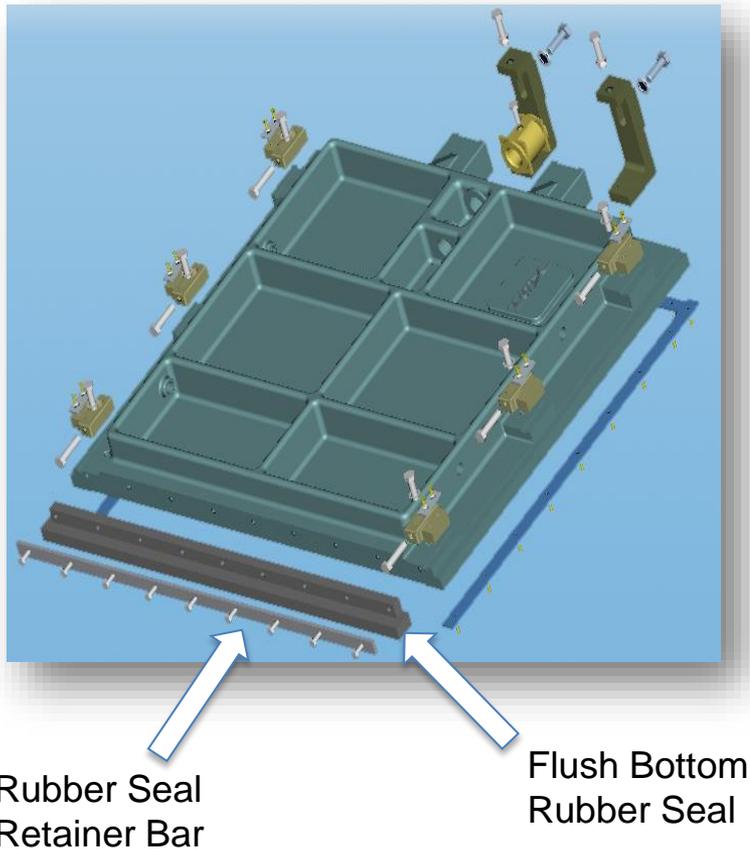


Cause – c: Leakage from the bottom in case of flush bottom closure gate. This can be due to collection of concrete or asphalt on the flush bottom seal top or on the machined face of support bar or shutter.

Remedy : The solution is to scrape and remove this foreign material without damaging the seal / surface while doing so.

TROUBLE SHOOTING AT SITE:

Problem 1. Leakage:

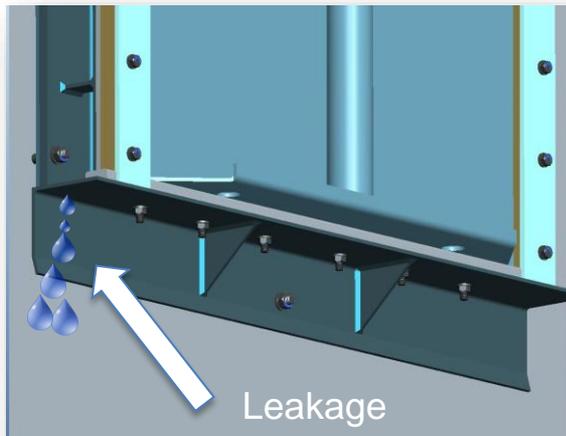


Cause – d :. If it is a flush bottom closure gate and there is leakage at one or more points at the invert, Then raise the gate and check for distortion of the seal. If a gate is kept propped open for a period of time, there is a possibility that resilient seal will distort and leakage will result.

Remedy : The only solution is to change the seal. An oversized seal will be sent to the contractor and he will have to remove the old seal, cut the new seal to the same length, place the seal retainer bar on the seal and drill the holes. The new seal would then be attached using the same retainer bar and bolts.

TROUBLE SHOOTING AT SITE:

Problem 1. Leakage:



Cause – e : If the gate leakage is concentrated in one area or if it is all across the top, or down one side, check for distortion of the gate frame.

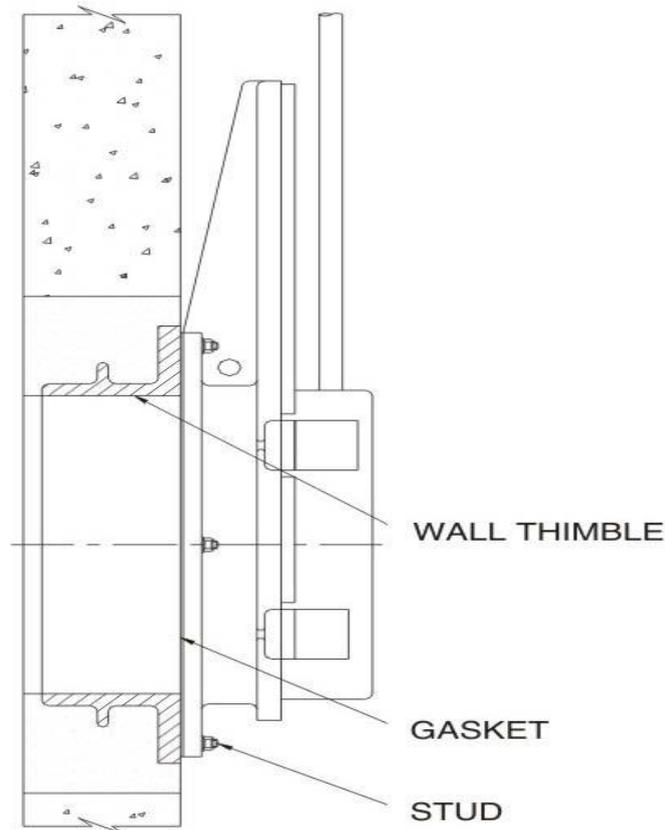
Remedy : If the frame is distorted, then by tightening the wedges with considerable force, it may be possible to stop the leakage through the gate.

However this may not be right approach if the distortion is high because in such cases, when the gate is opened and closed again, it will not be possible to close the gate completely and leakage will reoccur.

Hence ideally frame distortion should be removed to improve the leakage performance.

TROUBLE SHOOTING AT SITE:

Problem 1. Leakage:

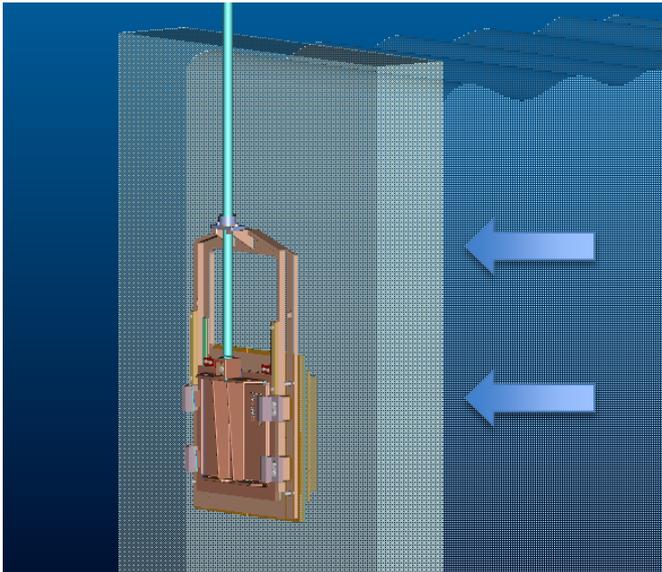


Cause – f : If leakage persists after the wedges are adjusted and if no distortion of the gate is observed then check for leakage between the flanges or around the frame. Sometimes the wall thimble is not firmly embedded in the concrete and water will leak between the wall thimble and the concrete.

Remedy : Use suitable sealants to shut this leakage or carry out suitable corrective measures in consultation with civil experts to prevent this leakage

TROUBLE SHOOTING AT SITE:

Problem 1. Leakage:



Cause – g : If the gate is a small gate under unseating head conditions, and it has no top wedges, leakage can occur along the top of the gate if there is too much force put on the stem.

Remedy : To determine whether too much of force is put on stem back off on the hoist so that the force on the disc is decreased and this should decrease the leakage. Once this is done the stop collar should be adjusted close to the operating nut so that it will limit the amount of force that can be placed on the disc.

TROUBLE SHOOTING AT SITE:

Problem 2. Noise:



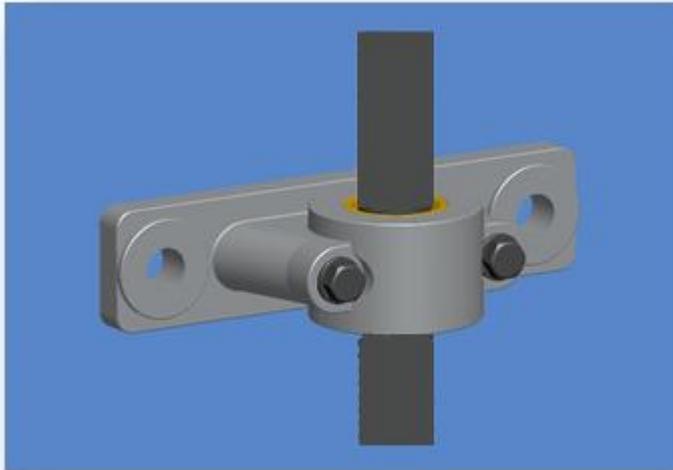
Well Lubricated Stem

Cause – a : A high pitched squeal or rubbing noise coming from the gate during operation - This is normally encountered where the stems have not been lubricated.

Remedy : The solution is to clean and thoroughly lubricate the threaded section of stem.

TROUBLE SHOOTING AT SITE:

Problem 2. Noise:



Cause – b : A rubbing or squealing noise can also be obtained where the stem passes through the stem guide.

Remedy : First ensure that stem does not forcibly rub the stem guide during up-down movement. Once this is ensured then the noise generated due to light touching between stem and stem guide can be corrected by coating the stem with a heavy, gummy, water proof grease.

TROUBLE SHOOTING AT SITE:

Problem 2. Noise:



Cause – c : A stem that looks well lubricated may still be causing some trouble if the grease is contaminated with rust particles. This happens when stem is covered by a steel or galvanized steel pipe cover. Rusting takes place within the pipe cover and rust particles drop into the grease.

Remedy : Rub the grease between your fingers to determine whether or not there are particles. If there are particles in the grease, the old grease should be cleaned off and the stem lubricated. Also, the pipe covers should be well cleaned and painted inside or hot dipped galvanized.



TROUBLE SHOOTING AT SITE:

Problem 2. Noise:

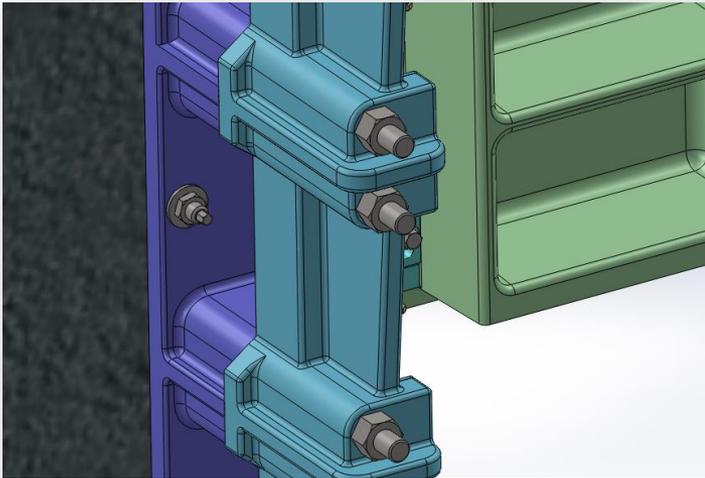


Cause – d : Chatter - Chatter can be caused by stems not properly lubricated and by the stem rubbing on stem guides during the operation. Chatter will also be heard where gates are operated under high head conditions and they are being opened from the fully closed position. With very small openings, vibration can be set up because of high velocity beneath the gate once the gate has been opened a few inches.

Remedy : There is nothing much that can be done about this type of chattering noise and it is not generally harmful.

TROUBLE SHOOTING AT SITE:

Problem 2. Noise:

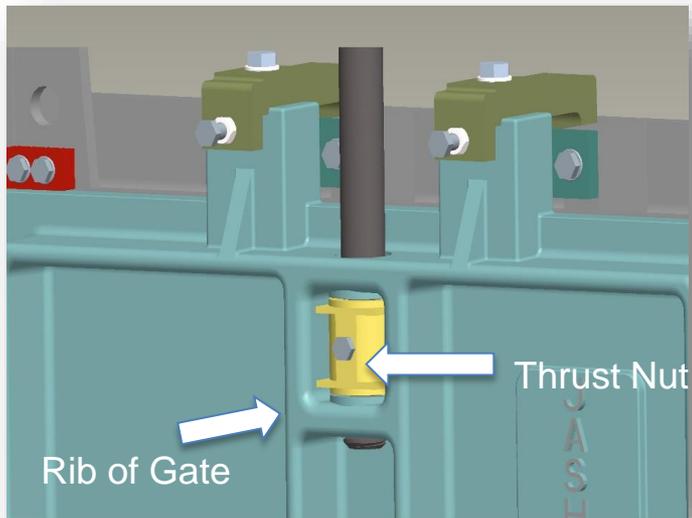


Cause - e : One shot noise on opening. Sometimes, when the gate is being pulled from the wedges, there will be a loud crack or bang. This will occur on occasion when the gate has been pushed into the wedges with considerable force.

Remedy : This is not a harmful noise and will not damage the gate.

TROUBLE SHOOTING AT SITE:

Problem 2. Noise:

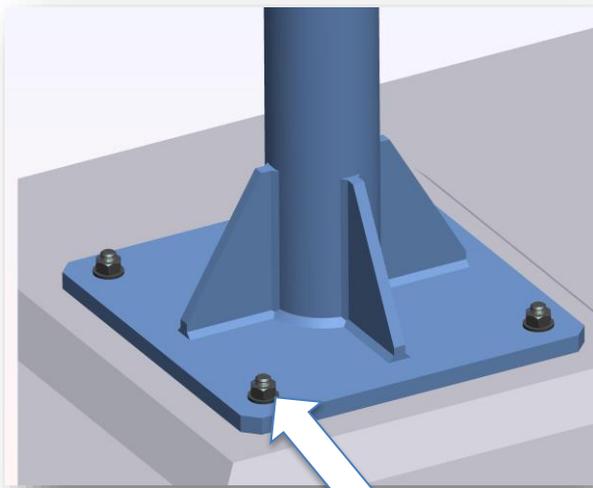


Cause – f : One shot noise on closing - In the closing direction, in some hydraulic conditions, the gate disc will be held in the open position. This can normally be due to head on the gate being greater than the weight of the disc. The gate will then be pushed downward by the thrust nut and this may allow the gate, once it is in motion, to overcome the water load and drop the short distance between the thrust nut and the rub resulting in to this noise. This may be repeated two or three times, but will normally stop after the gate is partially closed.

Remedy : This is not a harmful noise and will not damage the gate.

TROUBLE SHOOTING AT SITE:

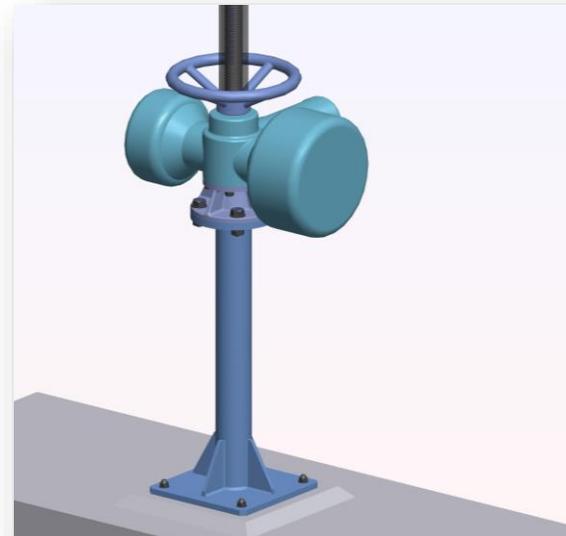
Problem 2. Noise:



Foundation Bolts

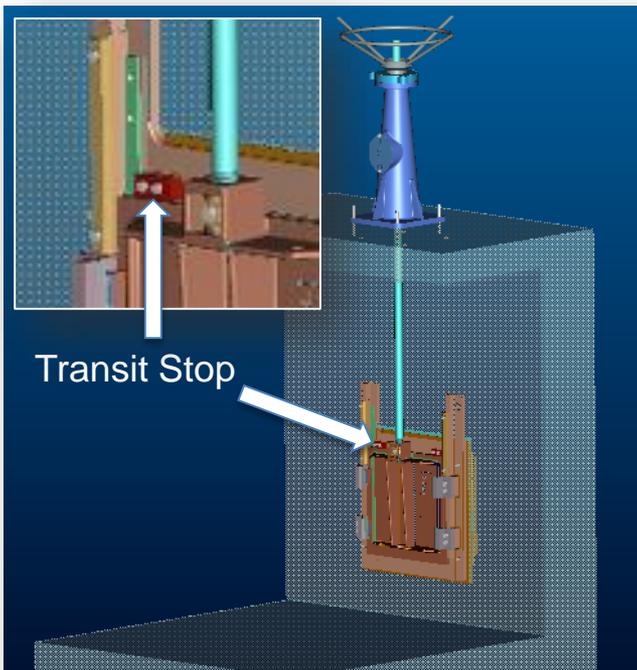
Cause – g : If the nuts on the bolts holding the floorstand to the concrete are not tight, there may be some vibration and noise.

Remedy : Tight them properly.



TROUBLE SHOOTING AT SITE:

Problem 3. Difficulty in gate operation:

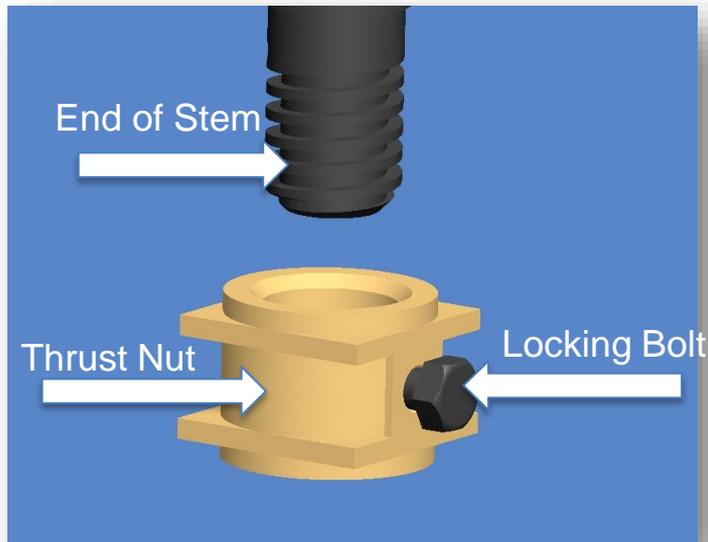


Cause – a : The gate will not open at all while initial starting. This may be due to the lock plates / stops still remaining secured on the gate.

Remedy : Remove the lock plates / stops which are generally painted red.

TROUBLE SHOOTING AT SITE:

Problem 3. Difficulty in gate operation:

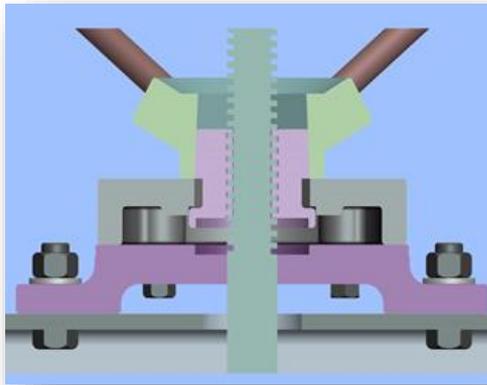


Cause – b : The gate will not open, but the stem moves. This happens when the stem block / connecting block has become disconnected from the end of the stem or the coupling has been disconnected. The most common cause of this is not tightening the locking bolt given on the stem block to the threads of the stem or not securing the locking pin between the stem coupling and the stem.

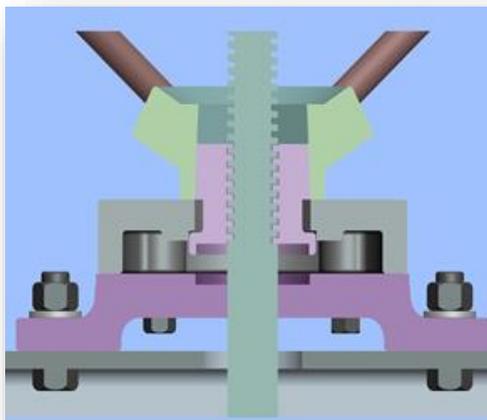
Remedy : The solution is to tighten the locking bolt in case of stem block or secure the locking pin in case of coupling.

TROUBLE SHOOTING AT SITE:

Problem 3. Difficulty in gate operation:



Correct



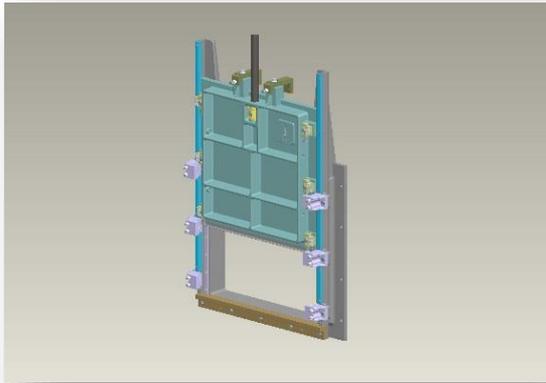
Not-Correct

Cause – c : The gate has been fully opened and will now not close. This may be due to the gate being opened too far thereby jamming the stem threads into the stem operating nut.

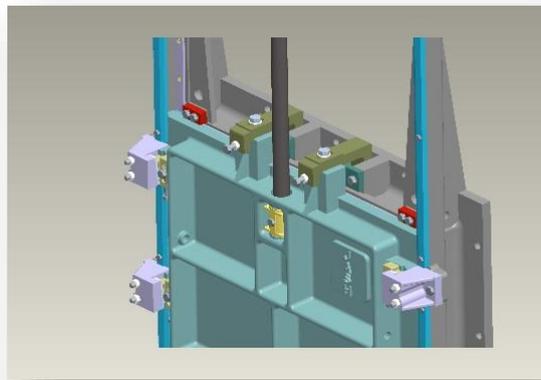
Remedy : This can normally be freed by putting a strain on the crank and closing the gate and tapping the top of the stem.

TROUBLE SHOOTING AT SITE:

Problem 3. Difficulty in gate operation:



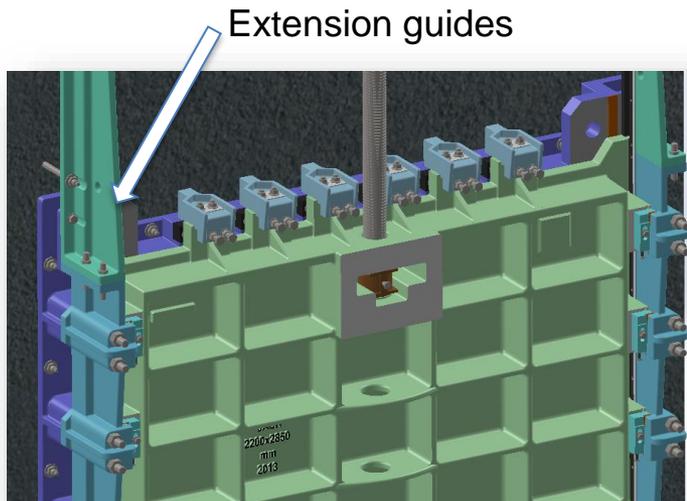
Cause – d : The gate will not close all the way. The most obvious problem would be an obstruction beneath the gate. However, this would probably flush out if the gate were raised again and then lowered. If the gate has top wedges, it is possible to have debris caught between the flanges in the area of the top wedge seat. This can prevent the gate from closing all the way.



Remedy : Clean the debris caught between the flanges in the area of the top wedge seat.

TROUBLE SHOOTING AT SITE:

Problem 3. Difficulty in gate operation:

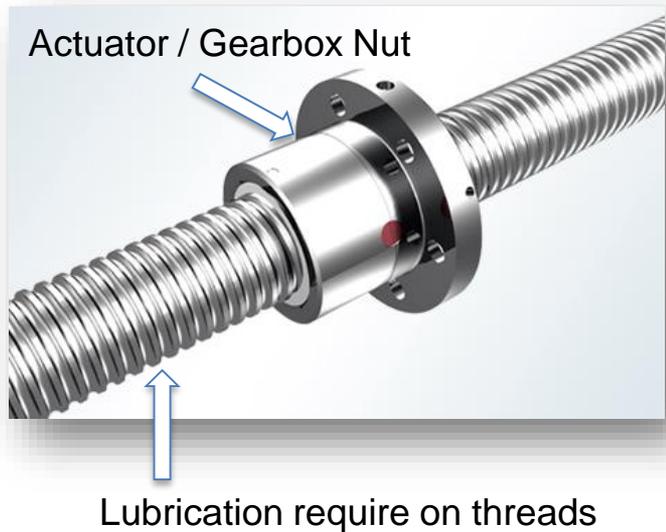


Cause – e : Difficulty in operation is sometimes caused by binding between shutter and frame guides in case of those gates which are provided with split extension guides. Binding can occur in the gate guides if the upper gate guide anchor bolts are tightened improperly. The binding in this area can also occur if the wall thimble is not installed properly and the centerline of the gate is not vertical.

Remedy : Check the alignment of gate guides and wall thimble. The gate guides can be realigned by loosening the anchor bolt nut. However if the wall thimble is not installed properly then nothing can be done and the only option is to live with the problem or set right the thimble by breaking it out of concrete.

TROUBLE SHOOTING AT SITE:

Problem 3. Difficulty in gate operation:

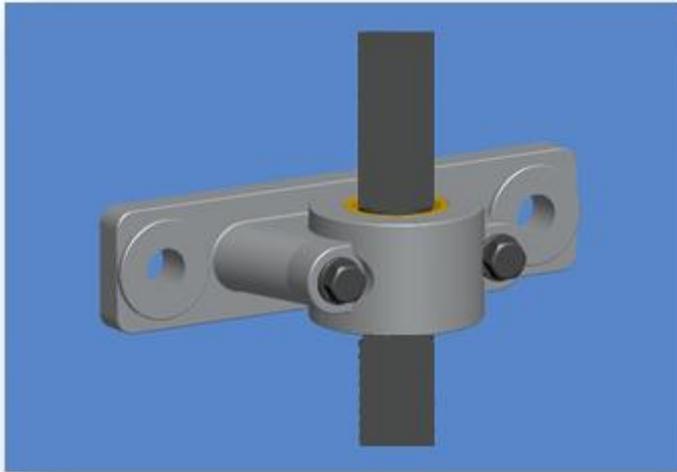


Cause – f : Difficulty in operation is also caused by lack of stem lubrication. Lack of stem lubrication doubles the force necessary to open the gate.

Remedy : Check and lubricate the spindle properly.

TROUBLE SHOOTING AT SITE:

Problem 3. Difficulty in gate operation:



Cause – g : Difficulty in operation is caused also due to bending of stem. Lack of straightness in stem results into its rubbing at stem guides and increases the force necessary to open the gate.

Remedy : If necessary, straighten the spindle.

TROUBLE SHOOTING AT SITE:

Problem 3. Difficulty in gate operation:



Cause – h : If the pinion shaft on the operator turns and the stem doesn't move, the teeth on the gears have been stripped. This is sometimes caused when far too much torque output is used to operate these gates or when the spindle or gate alignment is not proper.

Remedy : Replace the bevel Gear & pinion set of operating mechanism.

TROUBLE SHOOTING AT SITE:

Problem 4. Problems related to stems:



Cause – a : Stems found bent after unpacking : Stem are checked for straightness before packing and are still sometimes found bent. The reason for this can be improper support to the entire length of box while transportation, improper handling while trans-shipment or due to improper storing at site resulting into minor bending of stems.

Remedy : Any minor bending in stems should be straightened at the site before using such stems.



TROUBLE SHOOTING AT SITE:

Problem 4. Problems related to stems:



Cause – b : Tendency of the stem to bend due to over closing.

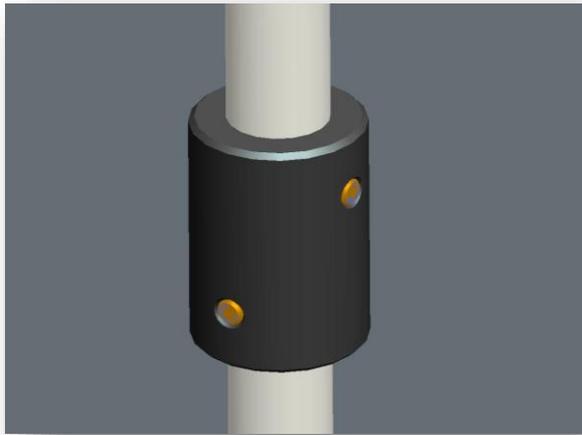
Remedy : The first thing to check for is the setting of the stop collar. The stop collar should be on the stem approximately 1.5 to 2 mm above the operating nut with the gate in the closed position. This will prevent the over closing of gate.

Secondly the location of the stem guides should be checked to ensure that the spacing matches the spacing indicated on the installation drawing. The guide should be tightened on the bracket. If this is loose, then the stem is not receiving any support from the bracket and is bending while over closing.

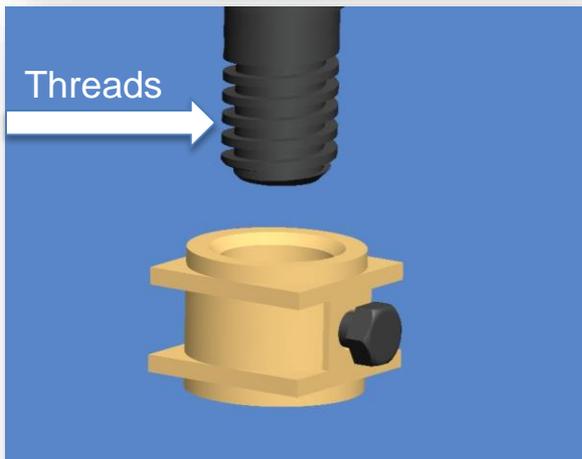
If the stem is already bent, it may not be beyond repair. Bent stems can be straightened successfully at site if the bending is minor or under a press if bending is more.

TROUBLE SHOOTING AT SITE:

Problem 4. Problems related to stems:



Cause – c : Difficulty in mounting of stem nut, stem block and coupling over threaded portion of stems.



Remedy : The first thing to check for is whether there is any burr or breakage of the initial thread which is creating obstruction in mounting. If this is the reason then remove the same and clean the threads so that threads engage easily.

We are pleased to support – Contact us !

Thank You



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