



Gates and pen work are important to any animal confinement situation.

They :

- Keep animals confined
- Direct animals into or out of pasture, pen, lane or alley
- Allow animals to be added or removed from a group
- Are used in a pen near a stanchion to help funnel animals into stanchion
- With addition of a rope or chain a gate near a corner can act as a clamp or squeeze chute to restrain an animal for rectal examination or treatment

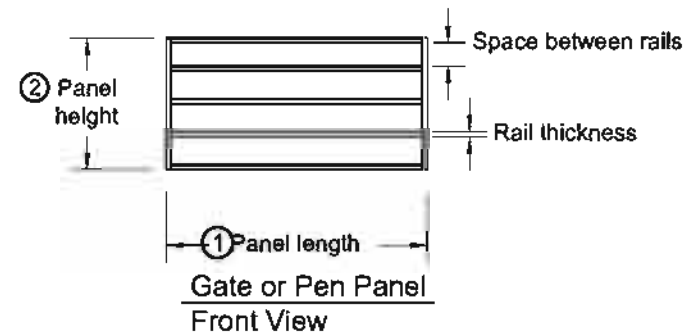
Gates and pen work are fabricated from metal, wood, plastic or fiberglass materials. Components may be prefabricated or fabricated on site and assembled to contain and direct animals and to allow necessary movement of workers and equipment around the dairy.

Items to consider when locating, selecting and installing gates include:

- Expected use of openings - animal size and number, workers, machinery, frequency of use.
- Minimize opportunity for animal entrapment or injury
- Gate swing based on animal, machinery or worker flow and desired function
- Functional requirements and personal preference and experience
- Location/installation to protect gate from damage by manure and feeding equipment

Design, installation and maintenance should consider planned or unplanned openings within the panels or around hinges and latches that could entrap an animal's head or leg. Protruding parts or posts can directly injure an animal or catch its neck chain or strap.

Consider worker safety by avoiding pinch points, protruding catch points and appropriate construction to retain animal. Ease of operation and escape paths from unruly animals are also important.



A basic component of pens and gates is the pen or gate panel. Pen and gate panels are fabricated to match appropriate openings between posts. Panel types can be described based on height, width, configuration, materials of construction and desired function or performance.

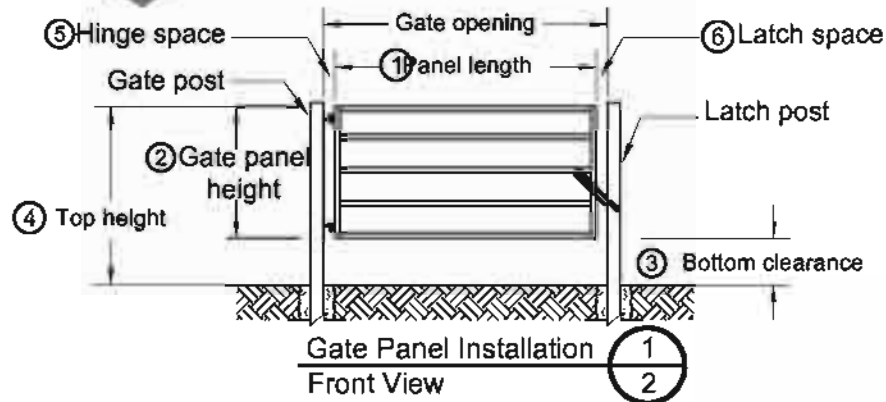
Hinges and latches are attached to gate panels and hinge and gate posts to provide for desired operation. Pen panels are secured at the desired height between posts by bolts, lag bolts or welds. Rails, mesh or solid materials used for fixed pen sides or fences can also be attached directly to the posts by welds, bolts, or nails.

Notes :

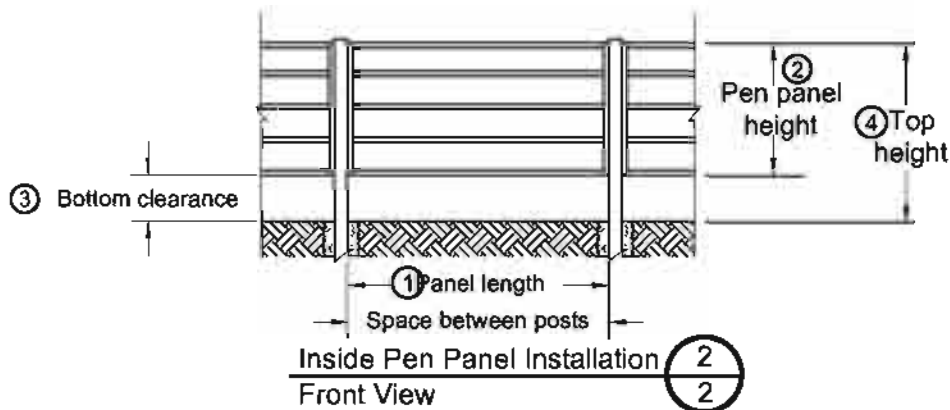
① Gate or Pen Panel Length : The primary difference between a gate and pen panel is mounting method. A pen panel length and support post spacing are coordinated to allow the panel to be permanently attached to the post by welding or bolting. A gate panel length must consider the width of opening but also the space required for the desired hinges and latch mechanism. Typically commercial gates are sold for an opening size but are physically shorter than that dimension to allow for the hinges and latches. There is no industry standard for what this allowance might be so it may be best to have gates, hinges and latches on hand or be aware of their actual dimensions before placing hinge and latch posts or build or order gates after as-built measurements of post location are available.

② Gate or Pen Panel Height : The distance from outside of bottom rail to the outside of the top rail of panel. This dimension is related to the rail size, number of rails and space between the rails.

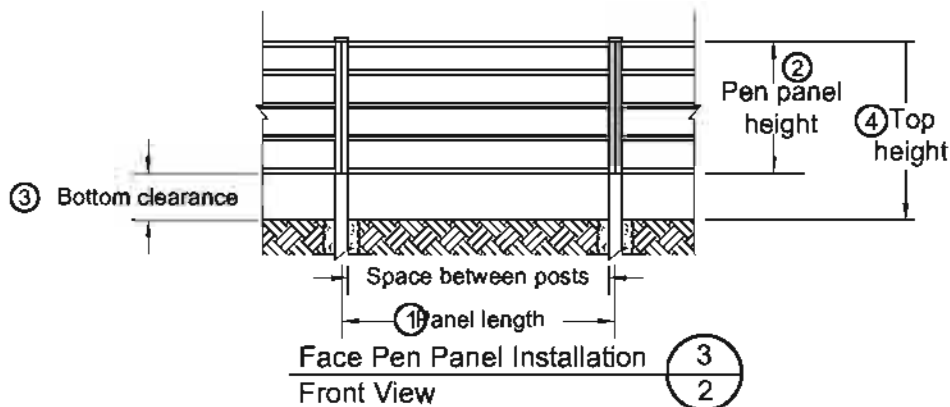
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Gate Panel Installation 1
Front View 2



Inside Pen Panel Installation 2
Front View 2



Face Pen Panel Installation 3
Front View 2

Notes :

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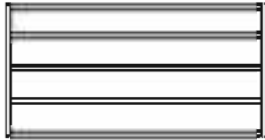
③ Bottom Clearance : Space allowed between the ground or floor and the bottom rail of the pen or gate panel.

④ Top Height : The distance from ground or floor to the top of installed gate or pen panel. It is the sum of the gate panel height plus the mounting height.

⑤ Hinge space : The distance required between the hinge end of a gate panel and the post to accommodate the hinge mechanisms. If this space is too large it can provide a location where animals can poke their head or legs through and become injured or entrapped.

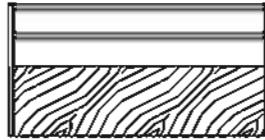
⑥ Latch space : The distance required between the latch end of a gate panel and the latch post to accommodate the latch mechanisms. If this space is too large it can provide a location where animals can poke their head or legs through and become injured or entrapped.

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A frame with horizontal rail or boards. Space between rails may be uniform or variable.

Horizontal Bar Panel $\frac{1}{3}$



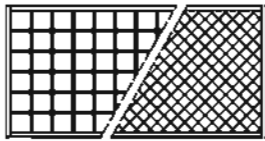
A frame with a combination of open and closed construction.

Partial Solid Panel $\frac{2}{3}$



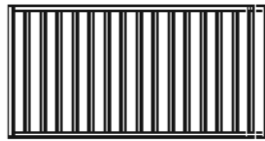
A frame that has been covered with a solid material such as sheet metal, plywood, boards or fiberglass material to reduce the opportunities for animal injury from leg entanglement, contain small animals from getting through or to block drafts, light or animal sight.

Solid Panel $\frac{3}{3}$



A frame that has been covered with welded wire, or mesh. Openings may be sized to provide maximum air flow, contain smaller animals, exclude birds or as a windbreak.

Welded Wire or Mesh Panel $\frac{4}{3}$



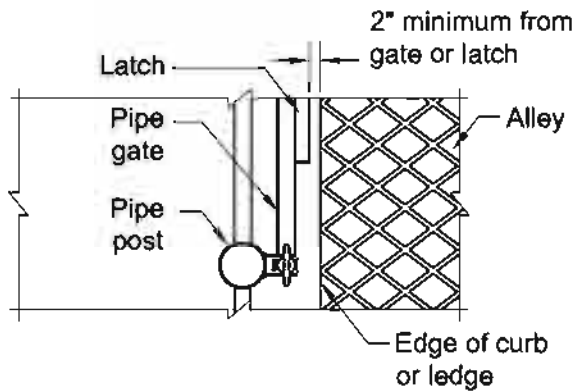
A frame with vertical bars or boards. This configuration is often used to discourage climbing animals. Space to prevent animals from going through or becoming trapped.

Vertical Bar Panel $\frac{5}{3}$



A frame with a pass-through or small gate to allow personnel to more easily pass through the gate. Remainder of panel can be any type.

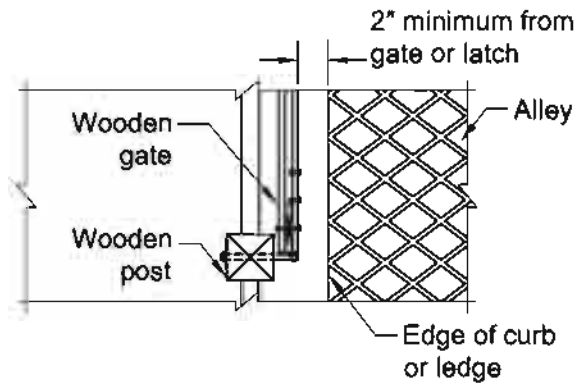
Auxiliary Opening Panel $\frac{6}{3}$



Post Placement

1
4

Cross Section



Post Placement

2
4

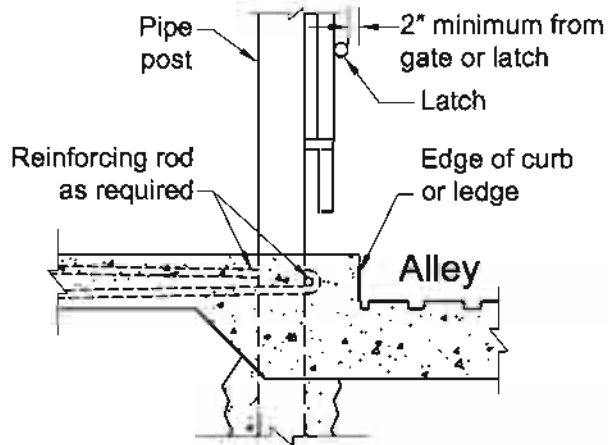
Cross Section

Post Locations :

Whenever possible locate posts in curbs to minimize manure build up, facilitate manure removal and reduce post deterioration.

A minimum of 2" of concrete is suggested on all sides of reinforcing rod or post to prevent break out of curb or ledge at the post.

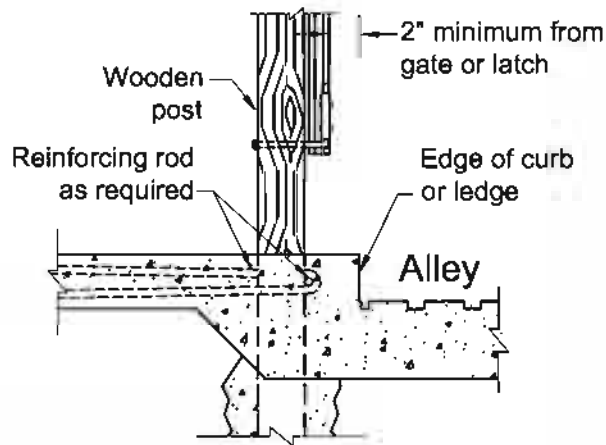
Locate gate hinge and latch posts far enough from the edge of the curb or step to provide clearance for the entire gate assembly plus 2" for protection from equipment damage.



Post Placement

3
4

Cross Section

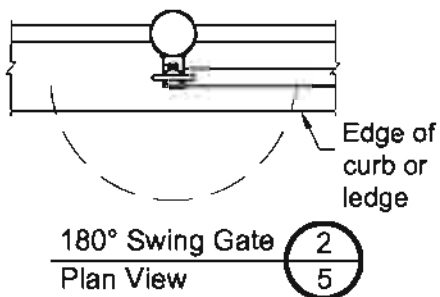
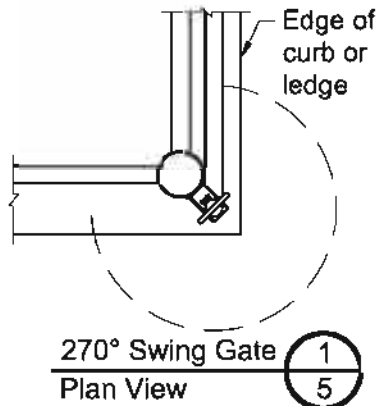


Post Placement

4
4

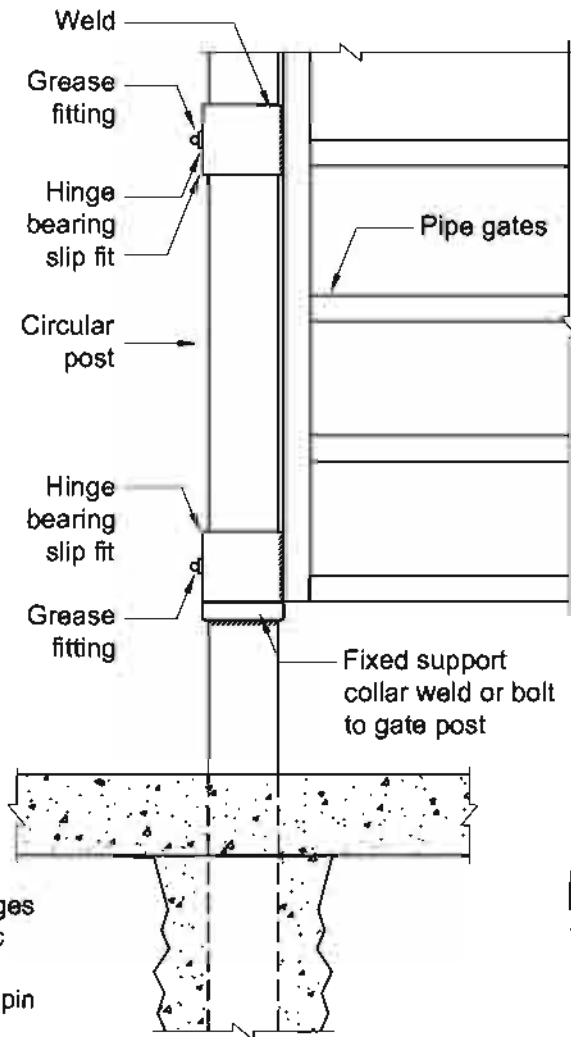
Cross Section

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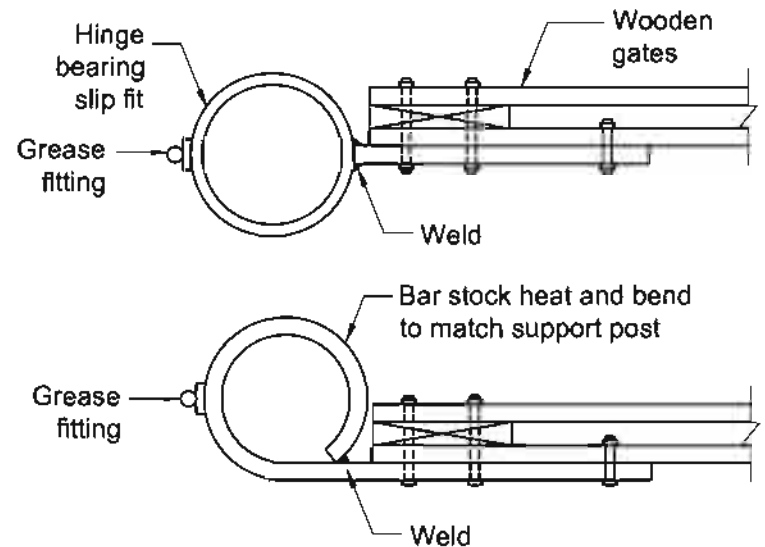


Hinge Location and Type :

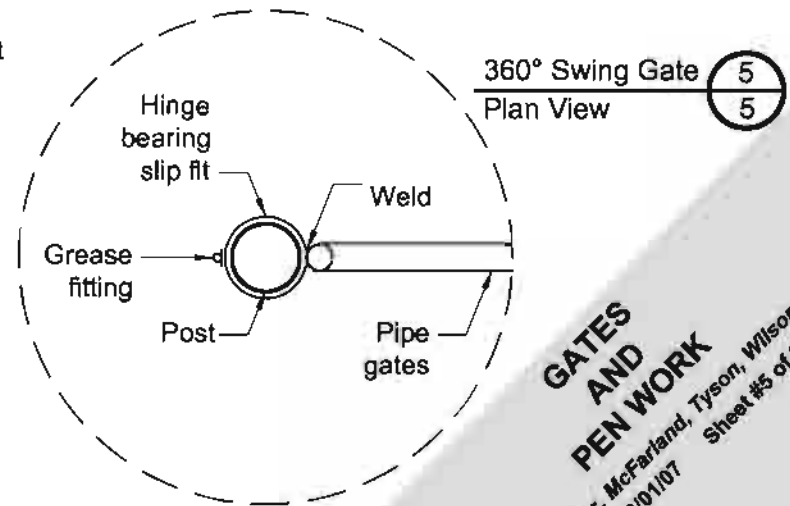
When selecting and orienting hinges consider the total desired swing arc necessary for the gate. The type of hinge and the location of the hinge pin in relation to the gate positions are important. Also consider the force that the hinge will need to withstand from the weight and length of the gate or animals lifting the gate off the hinges.



360° Swing Gate 3
Cross Section 5

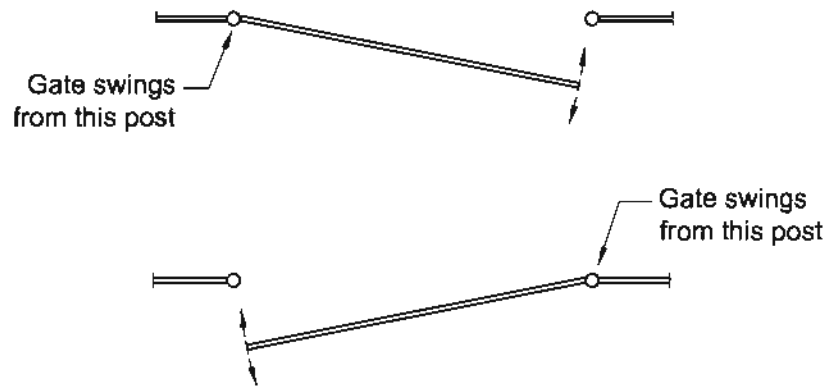


360° Hinges for Wooden Gate 4
Plan View 5



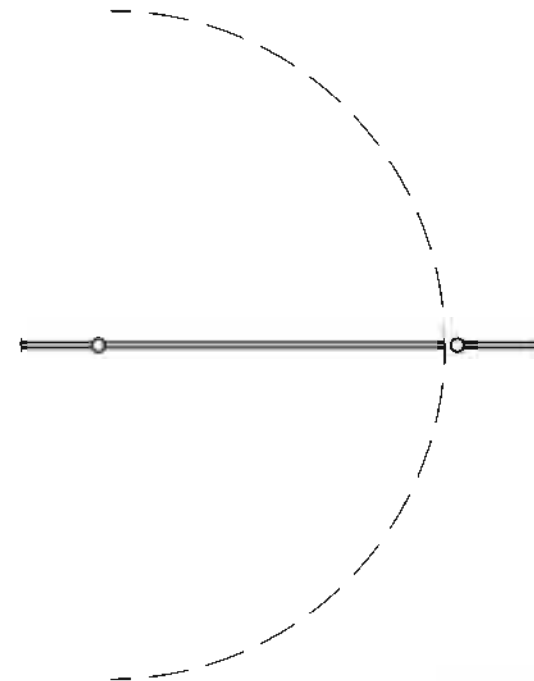
360° Swing Gate 5
Plan View 5

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Dual Swing : A combination hinge and latch that allows the gate to be opened and swung from either end. This works best with short light weight gates.

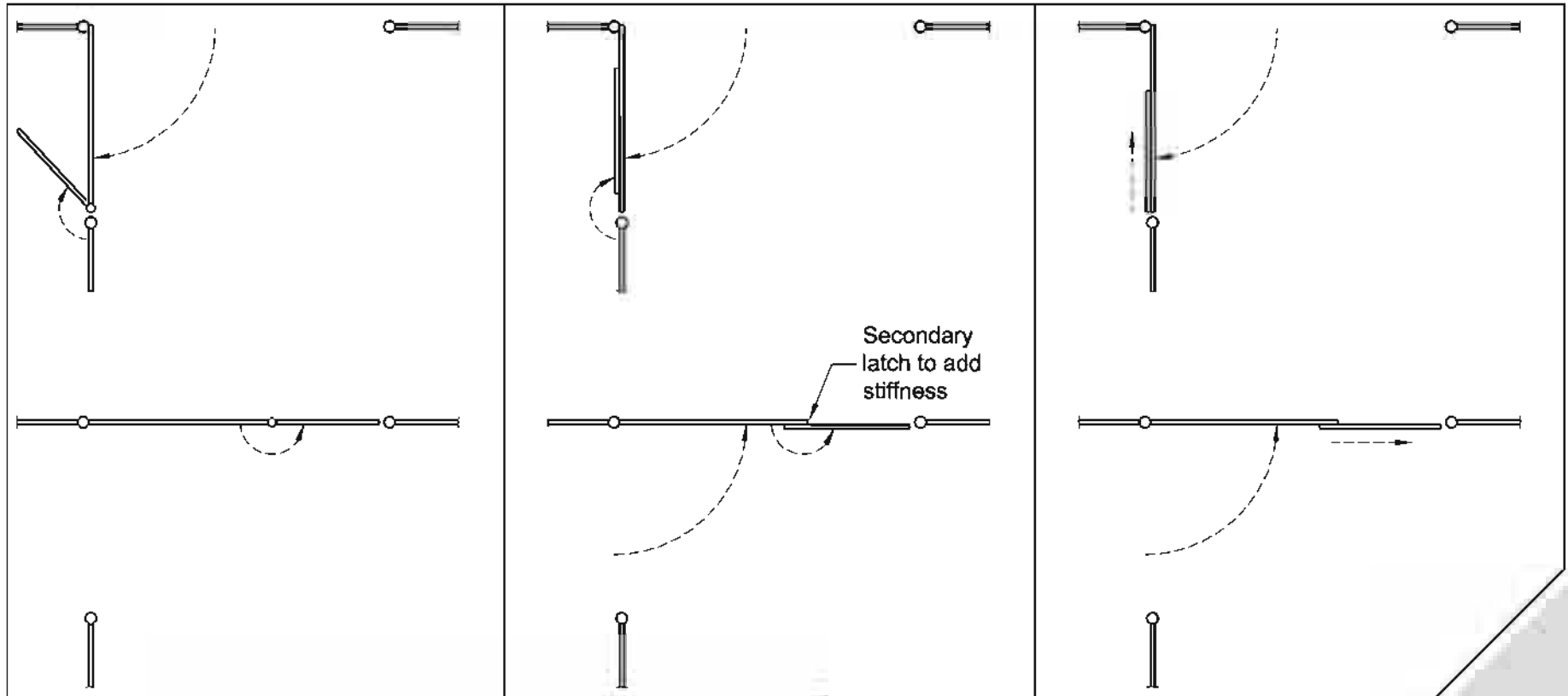
Dual Swing - Hinge/Latch Combination Both Ends 1
6
Plan View



Fix Length Swing : Gate hinge is located to allow gate to swing to several locations. This is the most common gate type.

Fixed Length Swing 2
6
Plan View

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Dual Length with Hinged Extension :

A second panel is hinged to the end of a fixed length gate to provide a gate with two effective lengths.

Dual Length with Hinged Extension

Plan View



Dual Length with Locking Extension :

A second panel is mounted on a hinge placed back from the end of a fixed length gate to allow the panel to be locked in the extended position for more stability.

Dual Length with Locking Extension

Plan View



Adjustable Length : A second panel is mounted

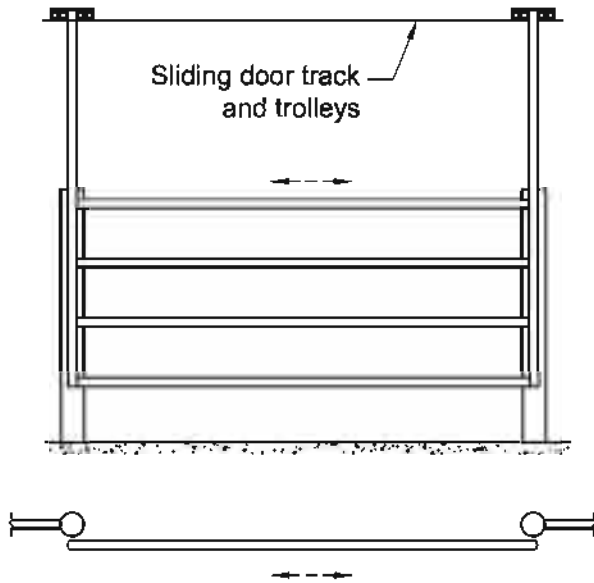
so it can extend from a fixed length gate to allow continuous adjustment of gate length. This allows the gate to latch to posts more than one distance from the hinge post.

Adjustable Length

Plan View



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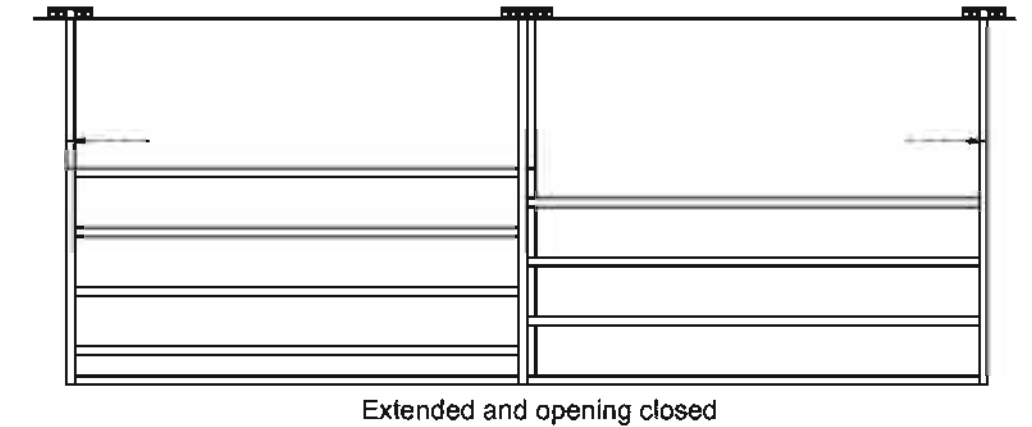


Sliding : A gate panel suspended from track and roller system perpendicular to travel path allows gate to roll to one side of opening.

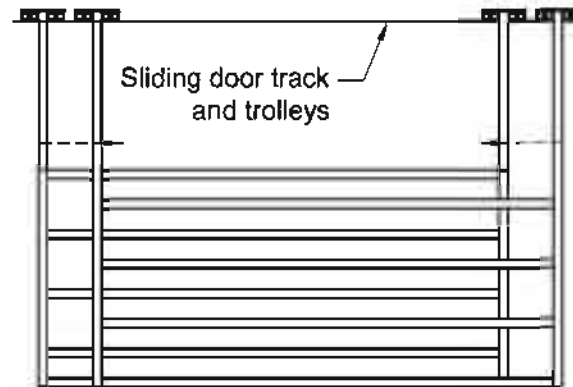
Sliding Gate

1
8

Plan View



Extended and opening closed



Collapsed and stored



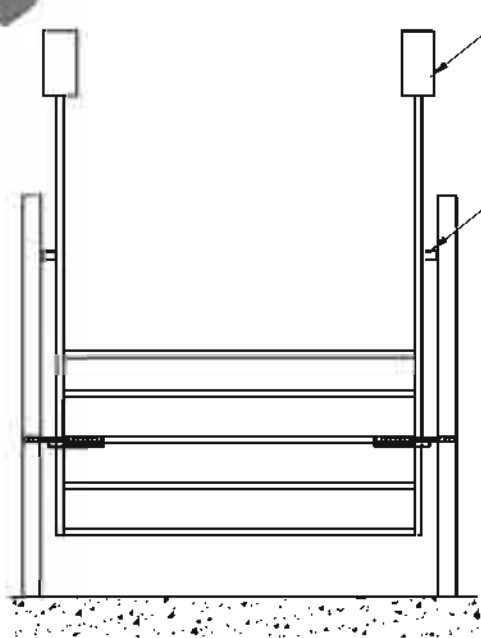
Sectional Telescoping Sliding : Two or more nested panels suspended from a track and roller system allows a wide gate to open into narrow storage area.

Sectional Telescoping Sliding Gate

2
8

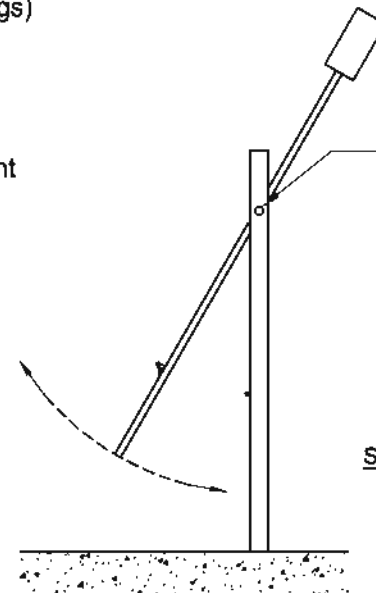
Front and Plan View

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Counter weights
(or use springs)

Pivot above
desired height
clearance



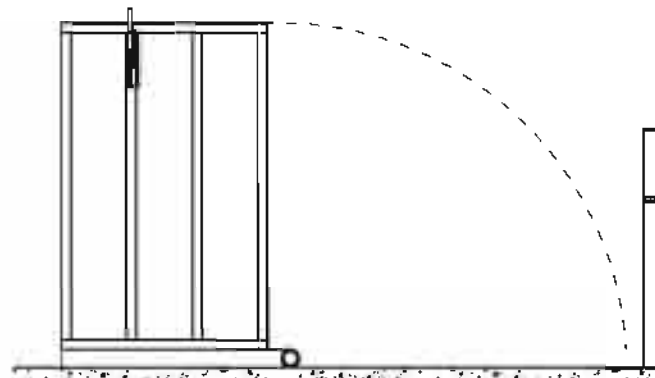
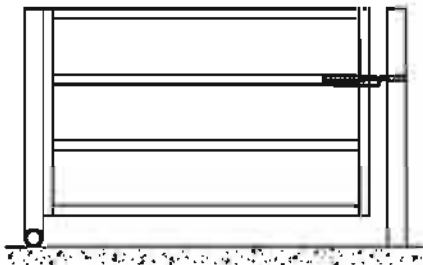
Pivot above
desired height
clearance

Swing-Up : Gate panel swings up on horizontal pivot points to allow clearance below. Counter weights or springs on extension arms aid in operation.

Swing-Up Gate

1
9

 Front and side view



Tilt-up : A single pivot point allows gate to swing up and back from opening.

Tilt-Up Gate

2
9

 Front View

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