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<http://www.itrc.org/reports/flapgate.flapgate.htm>



moving water in new directions

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TECHNICAL MEMORANDUM

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To: End User

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Subject: Stabilizing Cylinders for ITRC Flap Gates

The ITRC Flap Gate is a simple automatic device for upstream water level control. Dr. Charles Burt from the Irrigation Training and Research Center (ITRC) of Cal Poly State University created a program in Microsoft Excel that allows the user to design an ITRC Flap Gate to their specific channel dimensions and capacities. The ITRC Flap Gate can be designed using either concrete (148 lb/ft³) or steel (490 lb/ft³) as the counterweight.

Regardless of which counterweight design is chosen, ITRC recommends that two stabilizing cylinders be installed with the Flap Gate. Though some Flap Gates work effectively without the aid of stabilizing cylinders, in most cases the stabilizing cylinders are necessary to act as dampeners for the Flap Gate by absorbing the waves and turbulences that travel down the canal or channel.

The stabilizing cylinders should be mounted so that the rod of the cylinder is extending **upward**. It can be argued that orienting the cylinder with the rod extending upwards will invite water, dirt, and debris to get down into the cylinder past the seals. However, this risk was not considered as great as the risk of oil leaking out of the cylinder and contaminating the passing water. It is also recommend that the cylinders be mounted in such a fashion that as the gate opens, the cylinders are being compressed and not extended.

Stabilizing cylinders are recommended rather than regular shock absorbers, because stabilizing cylinders have inherently different resistive characteristics than do shock absorbers. For most

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Flap Gate applications, a regular shock absorber is too stiff and the resistance provided by the shock absorber would interfere with the natural motion of the gate.

Shown below are photographs of a Flap Gate installed in the San Joaquin Valley. The configuration of the stabilizing cylinders and their precise location in relation to the gate can only be determined based on the specific site dimensions.



Stabilizing cylinders are oftentimes referred to as *steering stabilizers* in the automotive industry. Automotive steering stabilizers can be purchased at many local auto part stores such as NAPA or Sears and have been used by many irrigation districts on their ITRC Flap Gates.

The table below lists a series of Monroe steering stabilizers available from NAPA Auto Parts and Sears stores. Each stabilizer is listed along with its Monroe part number for ease of ordering. Selecting the appropriate stabilizer for each Flap Gate will depend upon the specific gate dimensions. The ITRC website (www.itrc.org/reports/flapgate/flapgate.htm) contains a Flap Gate design spreadsheet which includes a tool for selecting the correct steering stabilizer.

Steering Stabilizer Cylinders available from NAPA Auto Parts						
Part No.	Mounting		Lengths (inches)			Parts Pack
	Upper	Lower	Compressed	Extended	Travel	
SC-2911	L1	L1	13.250	22.875	9.625	Two P1198
SC-2913	L1	L1	14.125	24.000	9.875	P837 P847
SC-2915	L1	L1	12.125	19.875	7.750	Two P848
SC-2916	L1	L1	13.250	22.250	9.000	Two P849
SC-2917	L1	L1	11.625	18.750	7.125	Two P850

Note: The parts pack is not necessary in most installations.