



*Can be supplied in a multitude of shapes  
The self adjusting sealing system allows precise flow measurement  
Low-maintenance*

\*\*\*

### General Description

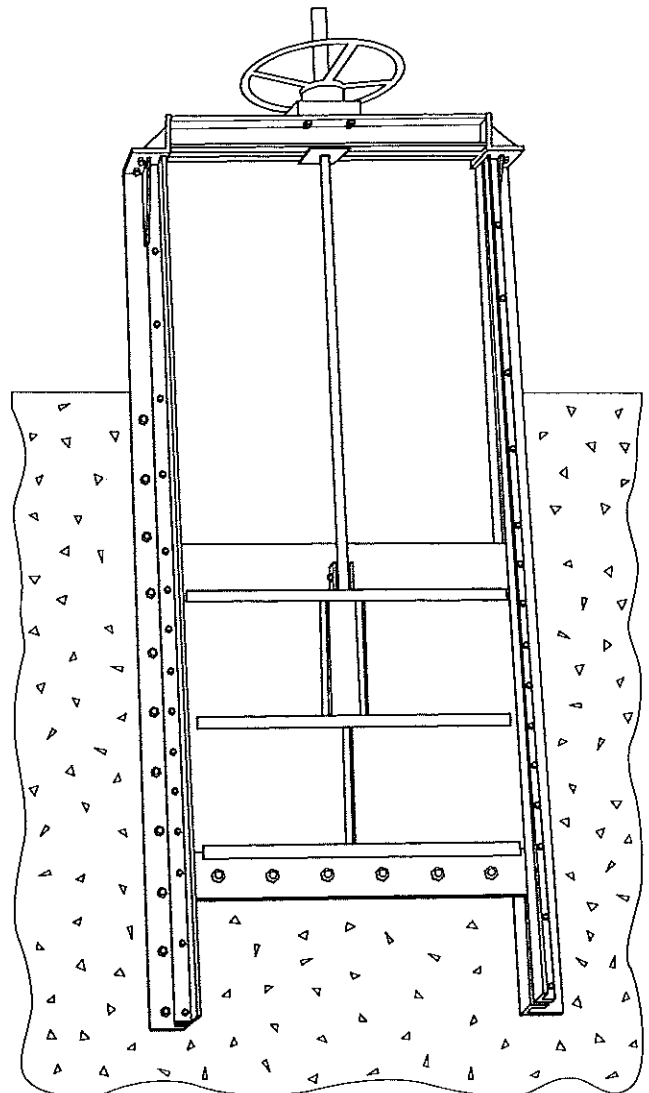
The Fontaine SERIES 40 weir gate is used to control flows in different applications by opening downwards and allowing water flow over the stainless steel plate. The SERIES 40 sealing system design is similar to that of the SERIES 20.

### Stainless Steel Construction

Because of its stainless steel construction, the SERIES 40 has high corrosion and erosion resistance, and can be operated many years with a minimum maintenance. Stainless steel allows the weir to be fabricated in multitude of shapes to measure precise flows. The most common shapes used for measuring flows are the rectangular weir, the 90 degree V-notch weir, the Cipoletti weir, and the Sutro weir.

### AWWA Standards

SERIES 40 gates are built to meet or exceed AWWA C501 standards pertaining to the design safety factors, stem and stem couplings, stem guides positioning, manual lifting devices, and leakage. As specified in AWWA C501 standards, all Fontaine SERIES 40 water gates are tested for operation before shipping.



STAINLESS STEEL WEIR GATES



**Fontaine**

**SERIES 40**

**DOWNWARD-OPENING WEIR GATES**

No.	Part	Material
1	Frame	Stainless steel ASTM A-240 ASTM A-276 Type 304L or 316L
2	Guides, side seals	Ultra high molecular weight polyethylene (UHMWPE) ASTM D-4020-96
3	Compression cord	Nitrile ASTM D-2000 M6BG 708, A14, B14, E014, E034
5	Slide	Stainless steel ASTM A-240 ASTM A-276 Type 304L or 316L
6	Bottom seal	Ultra high molecular weight polyethylene (UHMWPE) ASTM D-4020-96

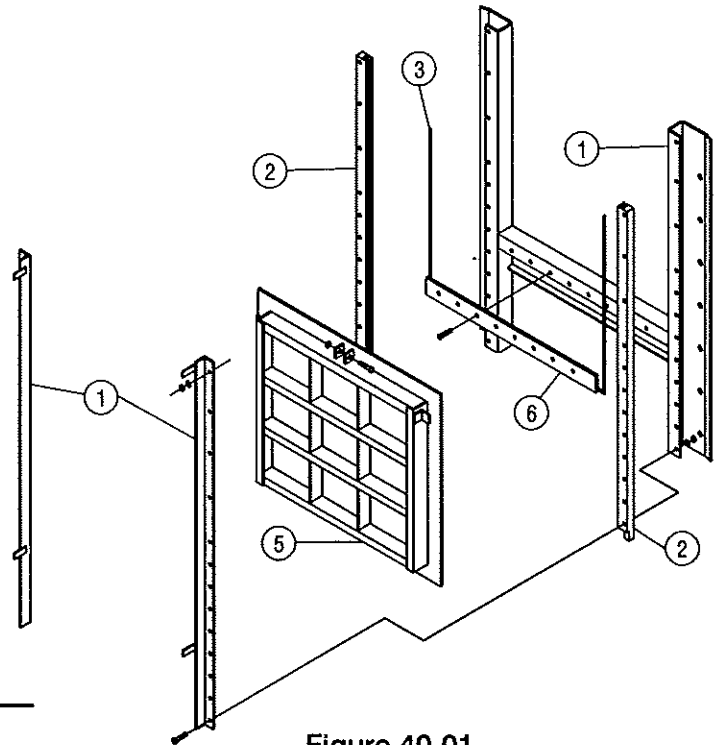
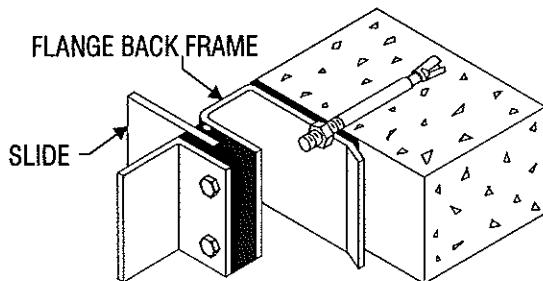


Figure 40-01  
Exploded view of a Series 40

**Flange Back Frame**

The stainless steel frame on the SERIES 40 is a flange back type (Detail 40-01) available in open or self-contained configurations, providing a solid one-piece gate. The rigidity provided by the frame makes it easier to handle in transportation and installation with less risk of distortion. The flange can be modified in order for the gate to be installed on many applications.



Detail 40-01  
Flange back frame

**Reinforced Slide**

The slide consists of a stainless steel plate reinforced with horizontal members welded to the plate making it a solid one-piece slide. It can be fabricated in various shapes to control and calculate the flow of water.



**SERIES 40**  
DOWNWARD-OPENING WEIR GATES

**UHMWPE Seals  
(U.S. and Canadian Patents)**

The side and bottom seals (Detail 40-02, 03) are the same as on the SERIES 20, allowing no metal-to-metal contact. They are made of a self-lubricating ultra high molecular weight polyethylene (UHMWPE). With a friction coefficient of less than 0.2 the seals make the gate easier to operate even after a long period of inactivity. The self-adjusting quality is obtained by a continuous compression cord that guarantees a perfect watertight seal between the slide and the frame in both seating and unseating conditions. The bottom seal (Detail 40-03) is a UHMWPE piece with continuous compression cord allowing contact between the slide and seal at all times.

**Mountings**

Figure 40-02 shows the most common Series 40 mounting (for more mounting details, refer to "Mountings" in the "Introduction" section).

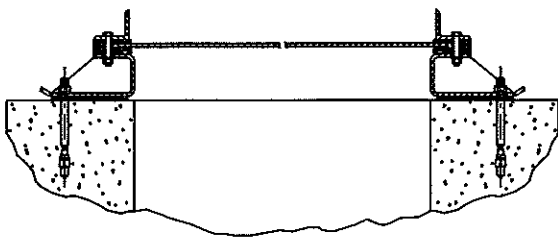
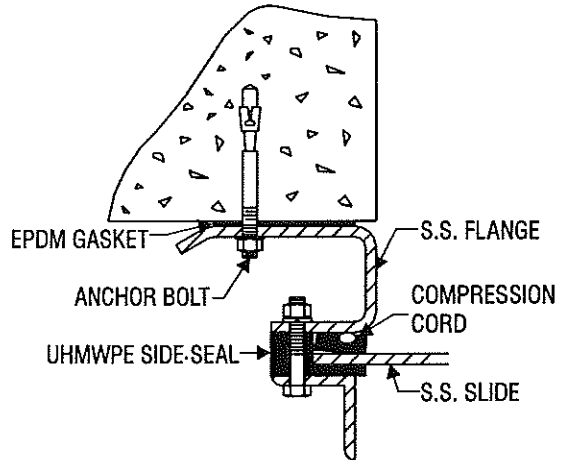
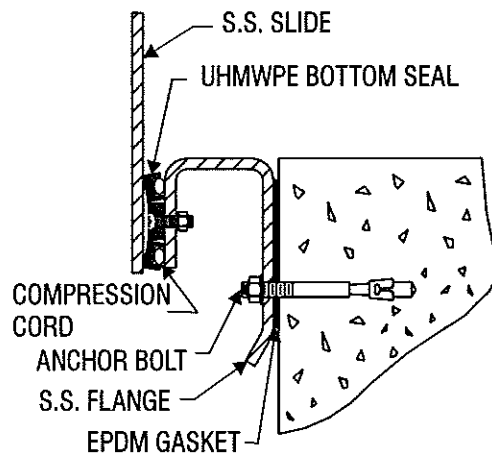


Figure 40-02  
Directly on a concrete wall  
(CW)



Detail 40-02  
Section "A-A" of the side frame



Detail 40-03  
Section "B-B" of the bottom frame

(Details 40-02, 03 refer to figures 40-08, 09, 10, 11 on pages 5, 6, 7 and 8)



**SERIES 40**  
DOWNWARD-OPENING WEIR GATES

**Calibrated Gauge**

Figure 40-03 shows the installation of a calibrated gauge necessary for flow calculation. The calibrated gauge is available in any units.

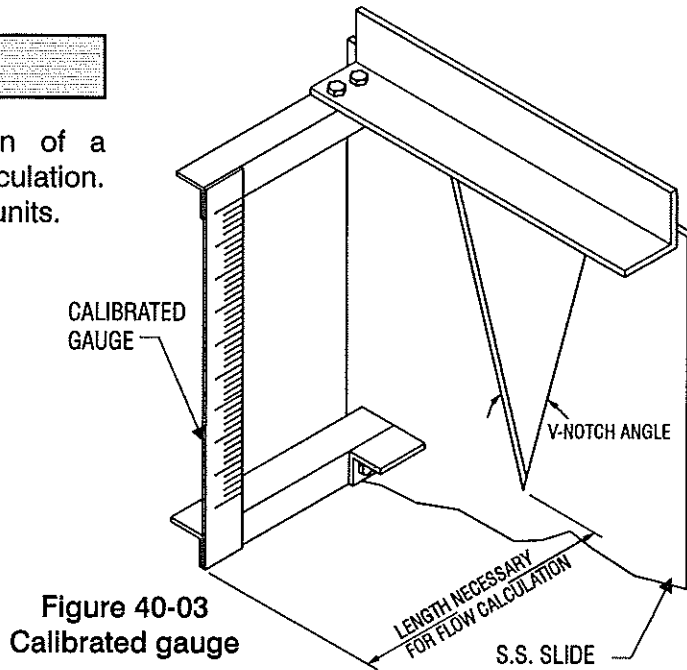


Figure 40-03  
Calibrated gauge

**Weir Types**

Figures 40-04 through 40-06 show a few examples of the different weir shapes possible.

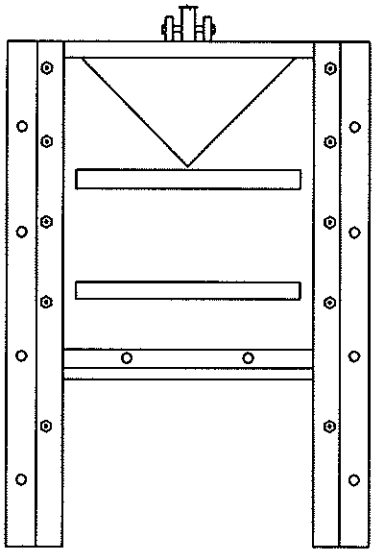


Figure 40-04  
90 degree V-NOTCH

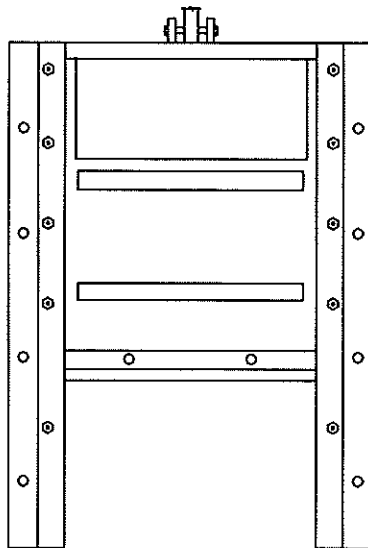


Figure 40-05  
Rectangular weir

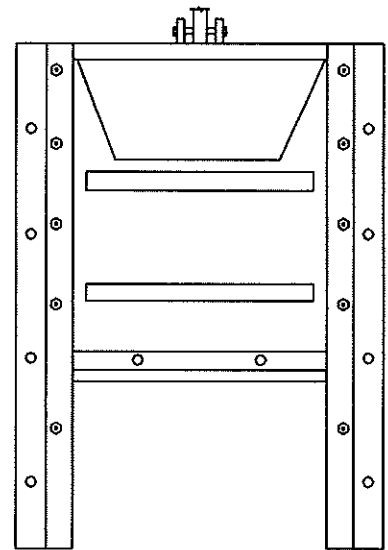


Figure 40-06  
Cipoletti weir



**Frame and Stem Configuration**

Figures 40-07 through 40-10 show the most common frame and stem configurations.

**Model 404**

Concrete wall mounted (CW) with pedestal-mounted gear box and crank operator (MNEP) Rising stem (RS1)

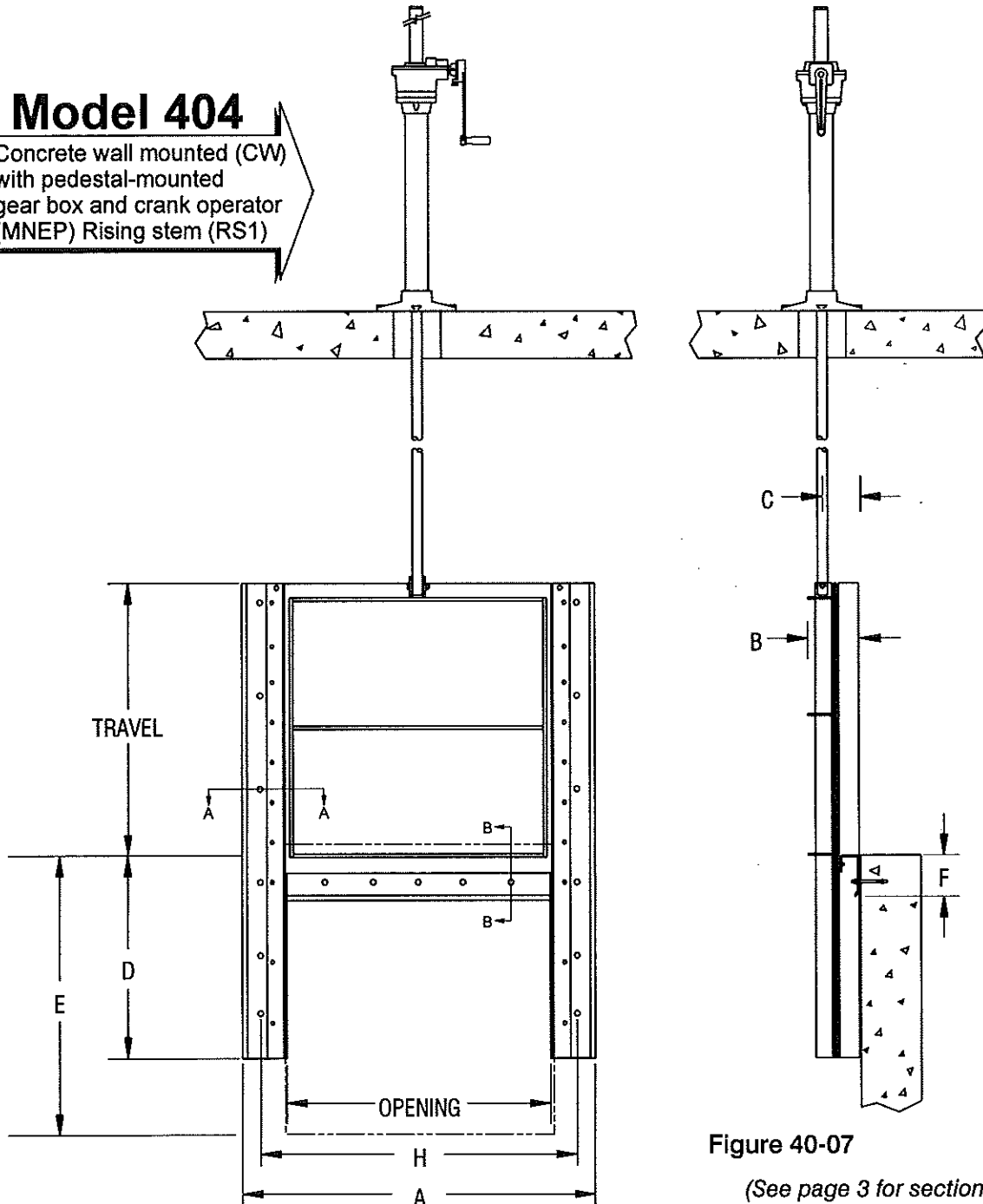


Figure 40-07

(See page 3 for sections A, B)



**Frame and Stem Configuration**

**Model 403**

Concrete wall-mounted (CW)  
with yoke-mounted  
gearbox and crank (MNE)  
Rising stem (RS2)

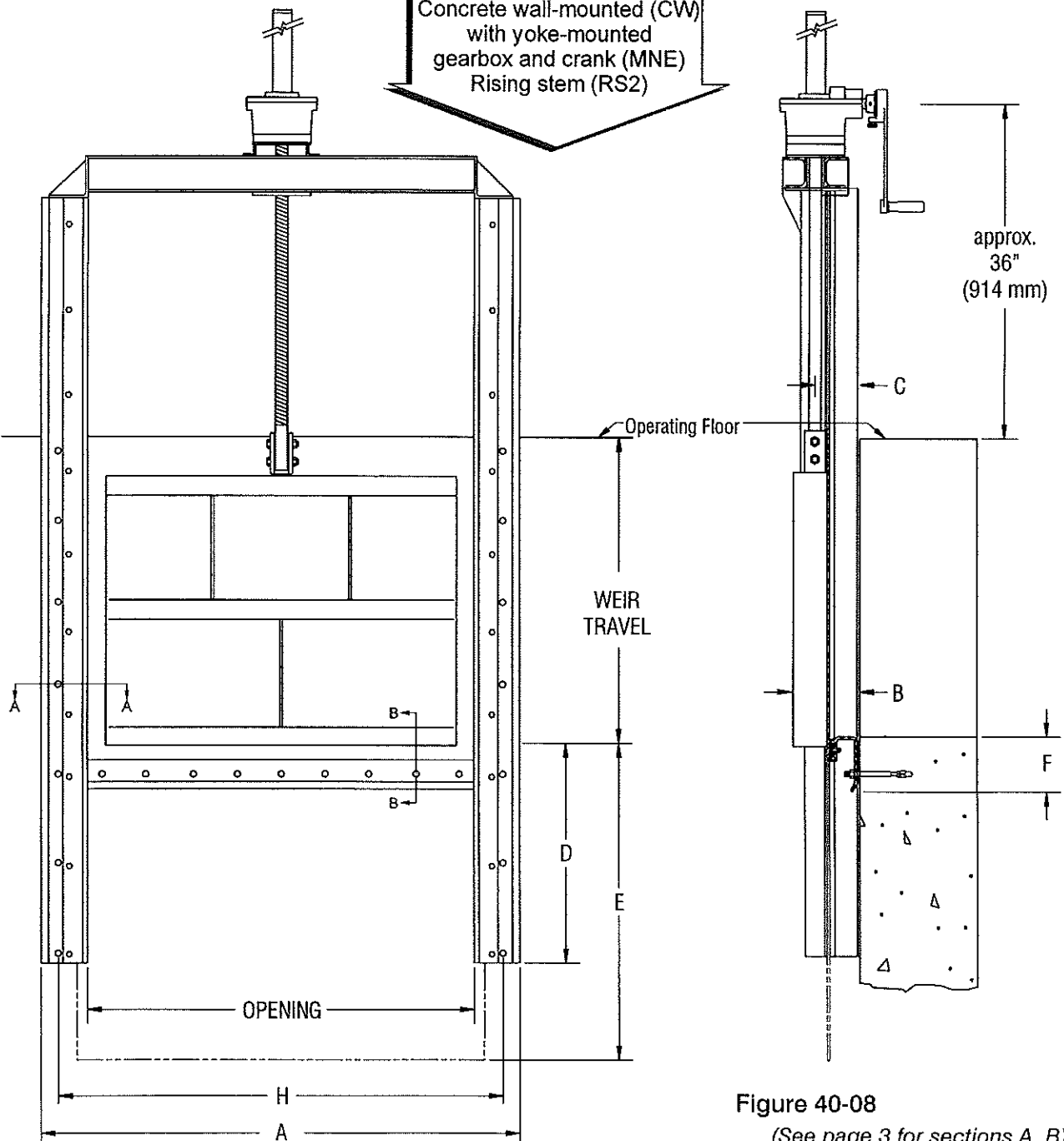


Figure 40-08

(See page 3 for sections A, B)



Frame and Stem Configuration

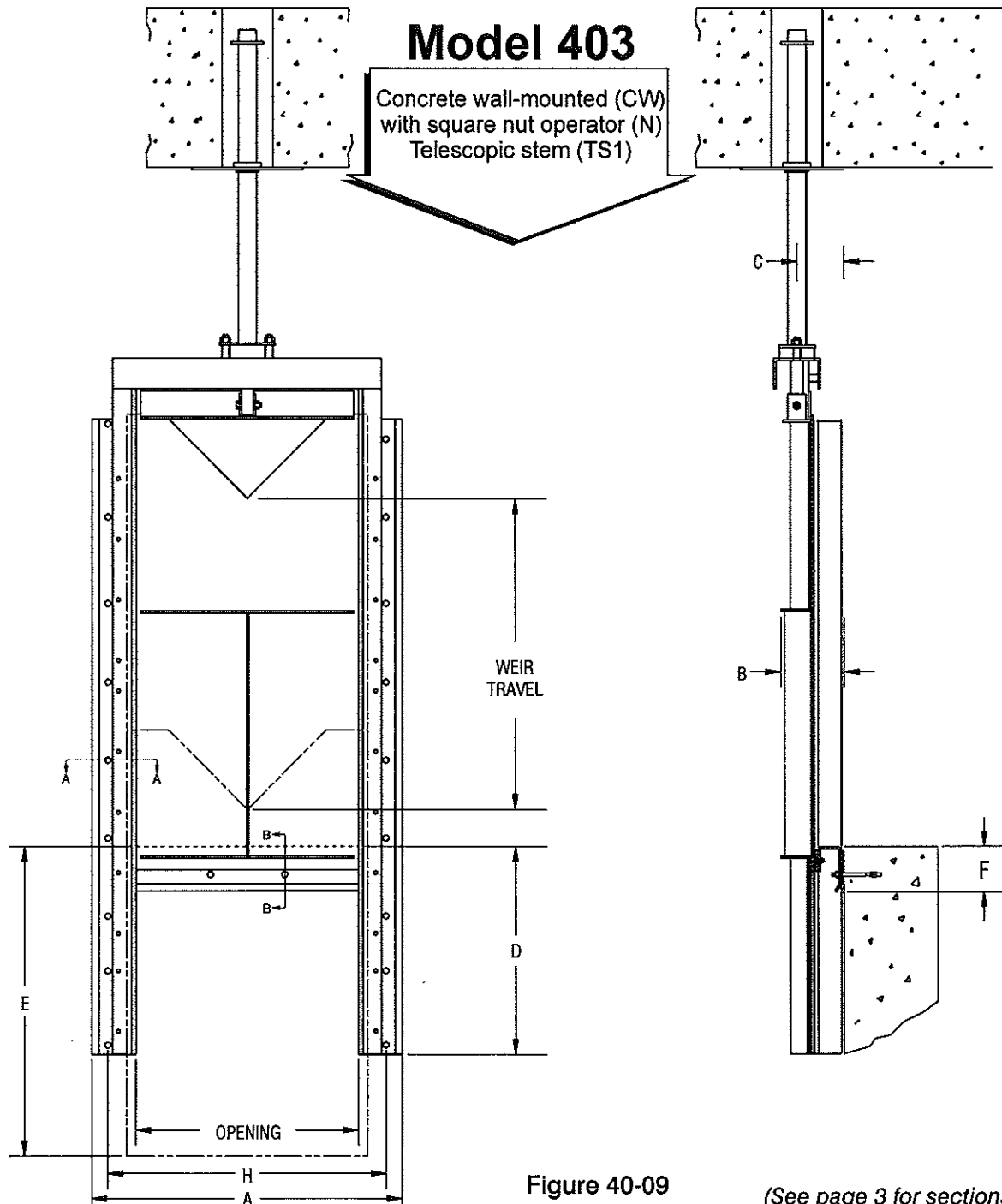


Figure 40-09

(See page 3 for sections A, B)



**Frame and Stem Configuration**

Figure 40-10 shows a dual stem arrangement for wide weirs.

**Model 403**

Concrete wall-mounted (CW)  
with dual gearbox and crank  
arrangement (D-MNE)  
Dual rising stem (RS2)

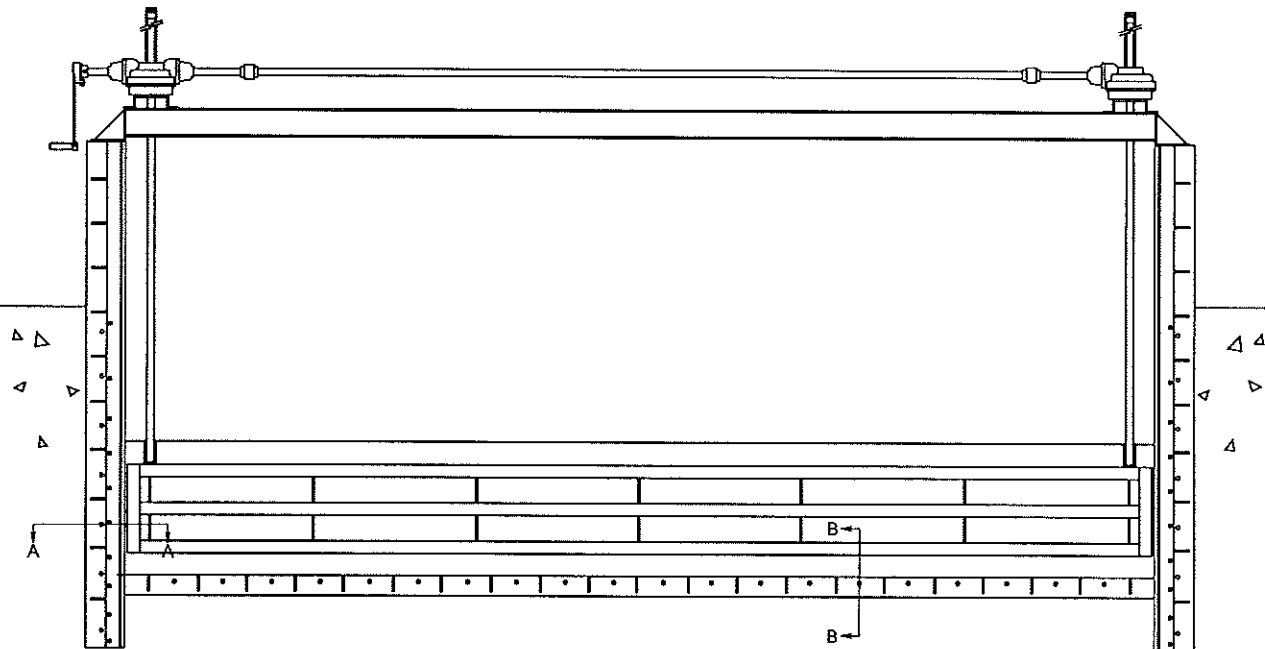


Figure 40-10

(See page 3 for sections A, B)

STAINLESS STEEL WEIR GATES



**Fontaine**

**SERIES 40**

**DOWNWARD-OPENING WEIR GATES**

**Dimensional Chart\***

FOR STANDARD CONCRETE WALL MOUNTED GATES (CW)

Gate size (**) inches / mm	A	B	C		D	E	F	H
			Rising stem	Non-rising stem				
6 x 6 152 x 152	15 1/2 394	6 152	4 3/4 121	4 3/4 121	6 1/2 165	8 1/2 216	4 3/4 121	12 305
8 x 8 203 x 203	17 1/2 445	6 152	4 3/4 121	4 3/4 121	7 7/8 199	10 1/2 267	4 3/4 121	14 356
10 x 10 254 x 254	19 1/2 495	6 152	4 3/4 121	4 3/4 121	9 1/8 233	12 1/2 318	4 3/4 121	16 406
12 x 12 305 x 305	21 1/2 546	6 152	4 3/4 121	4 3/4 121	10 1/2 267	14 1/2 368	4 3/4 121	18 457
14 x 14 356 x 356	23 1/2 597	6 152	4 3/4 121	4 3/4 121	11 7/8 301	16 1/2 419	4 3/4 121	20 508
15 x 15 381 x 381	24 1/2 622	6 152	4 3/4 121	4 3/4 121	12 1/2 318	17 1/2 445	4 3/4 121	21 533
16 x 16 406 x 406	25 1/2 648	6 152	4 3/4 121	4 3/4 121	13 1/8 335	18 1/2 470	4 3/4 121	22 559
18 x 18 457 x 457	27 1/2 699	6 152	4 3/4 121	4 3/4 121	14 1/2 369	20 1/2 521	4 3/4 121	24 610
20 x 20 508 x 508	29 1/2 749	6 152	4 3/4 121	4 3/4 121	15 7/8 402	22 1/2 572	4 3/4 121	26 660
21 x 21 533 x 533	30 1/2 775	6 152	4 3/4 121	4 3/4 121	16 1/2 419	23 1/2 597	4 3/4 121	27 686
22 x 22 559 x 559	31 1/2 800	6 152	4 3/4 121	4 3/4 121	17 1/8 436	24 1/2 622	4 3/4 121	28 711
24 x 24 610 x 610	33 1/2 851	6 152	4 3/4 121	4 3/4 121	18 1/2 470	26 1/2 673	4 3/4 121	30 762
26 x 26 660 x 660	35 1/2 902	6 152	4 3/4 121	4 3/4 121	19 7/8 504	28 1/2 724	4 3/4 121	32 813
28 x 28 711 x 711	37 1/2 953	6 152	4 3/4 121	4 3/4 121	21 1/8 538	30 1/2 775	4 3/4 121	34 864
30 x 30 762 x 762	39 1/2 1003	6 152	4 3/4 121	4 3/4 121	22 1/2 572	32 1/2 826	4 3/4 121	36 914
32 x 32 813 x 813	41 1/2 1054	6 152	4 3/4 121	4 3/4 121	23 7/8 606	34 1/2 876	4 3/4 121	38 965
34 x 34 864 x 864	43 1/2 1105	6 152	4 3/4 121	4 3/4 121	25 1/8 640	36 1/2 927	4 3/4 121	40 1016
36 x 36 914 x 914	45 1/2 1156	6 152	4 3/4 121	4 3/4 121	26 1/2 673	38 1/2 978	4 3/4 121	42 1067
38 x 38 965 x 965	47 1/2 1207	7 1/4 184	4 3/4 121	5 1/4 133	27 7/8 707	40 1/2 1029	4 3/4 121	44 1118

(\*) These dimensions are for information only. Do not use for installation or submittal purposes.

(\*\*) Fontaine Gates are also available for rectangular openings and in sizes other than those specified in this chart.

STAINLESS STEEL WEIR GATES



**Fontaine**

**SERIES 40**

**DOWNWARD-OPENING WEIR GATES**

**Dimensional Chart\***

CONT'D FOR STANDARD  
CONCRETE WALL MOUNTED GATES (CW)

Gate size (**) inches / mm	A	B	C		D	E	F	H
			Rising stem	Non-rising stem				
40 x 40 1016 x 1016	49 1/2 1257	7 1/4 184	4 3/4 121	5 1/4 133	29 1/4 741	42 1/2 1080	4 3/4 121	46 1168
42 x 42 1067 x 1067	51 1/2 1308	7 1/4 184	4 3/4 121	5 1/4 133	30 1/2 775	44 1/2 1130	4 3/4 121	48 1219
44 x 44 1118 x 1118	53 1/2 1359	7 1/4 184	4 3/4 121	5 1/4 133	31 7/8 809	46 1/2 1181	4 3/4 121	50 1270
46 x 46 1168 x 1168	55 1/2 1410	7 1/4 184	4 3/4 121	5 1/4 133	33 1/8 843	48 1/2 1232	4 3/4 121	52 1321
48 x 48 1220 x 1220	57 1/2 1461	7 1/4 184	4 3/4 121	5 1/4 133	34 1/2 877	50 1/2 1283	4 3/4 121	54 1372
50 x 50 1270 x 1270	59 1/2 1511	7 1/4 184	5 127	5 1/2 140	35 7/8 911	52 1/2 1334	4 3/4 121	56 1422
54 x 54 1372 x 1372	63 1/2 1613	7 1/4 184	5 127	5 1/2 140	38 1/2 978	56 1/2 1435	4 3/4 121	60 1524
60 x 60 1524 x 1524	69 1/2 1765	7 3/4 197	5 127	5 1/2 140	42 1/2 1080	62 1/2 1588	4 3/4 121	66 1676
66 x 66 1676 x 1676	75 1/2 1918	7 3/4 197	5 127	5 1/2 140	46 1/2 1182	68 1/2 1740	4 3/4 121	72 1829
72 x 72 1829 x 1829	81 1/2 2070	7 3/4 197	5 127	5 1/2 140	50 1/2 1283	74 1/2 1892	4 3/4 121	78 1981
78 x 78 1981 x 1981	90 1/2 2299	8 1/2 216	5 3/4 146	***	54 5/8 1388	80 5/8 2048	6 1/4 159	86 2184
84 x 84 2134 x 2134	96 1/2 2451	8 3/4 222	5 3/4 146	***	58 5/8 1490	86 5/8 2200	6 1/4 159	92 2337
90 x 90 2286 x 2286	102 1/2 2604	10 254	5 3/4 146	***	62 5/8 1592	92 5/8 2353	6 1/4 159	98 2489
96 x 96 2438 x 2438	108 1/2 2756	11 279	6 152	***	66 5/8 1693	98 5/8 2505	6 1/4 159	104 2642
102 x 102 2591 x 2591	114 1/2 2908	11 279	6 152	***	70 5/8 1795	104 5/8 2657	6 1/4 159	110 2794
108 x 108 2743 x 2743	120 1/2 3061	12 305	6 152	***	74 5/8 1896	110 5/8 2810	6 1/4 159	116 2946
114 x 114 2896 x 2896	126 1/2 3213	12 1/2 318	6 1/8 156	***	78 5/8 1998	116 5/8 2962	6 1/4 159	122 3099
120 x 120 3048 x 3048	132 1/2 3366	12 1/2 318	6 1/4 159	***	82 5/8 2100	122 5/8 3115	6 1/4 159	128 3251

(\*) These dimensions are for information only. Do not use for installation or submittal purposes.

(\*\*) Fontaine Gates are also available for rectangular openings and in sizes other than those specified in this chart.

(\*\*\*) Please contact manufacturer for further details.



## SERIES 40

### DOWNWARD-OPENING WEIR GATES

#### Typical Specifications

### 1. GENERAL CONDITIONS

**1.1. SCOPE.** This section covers Stainless Steel Downward Opening Weir Gates and operators.

**1.2. GENERAL.** The equipment provided under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with the drawings, specifications, engineering data, instructions and recommendations of the equipment manufacturer unless exceptions are noted by the engineer.

Gates and operators shall be supplied with all the necessary parts and accessories indicated on the drawings, specified or otherwise required for a complete, properly operating installation and shall be the latest standard product of a manufacturer regularly engaged in the production of water control gates.

Weir gates supplied under this section shall be Series 40 Stainless Steel Downward Opening Weir Gates as manufactured by H.Fontaine Ltd.

**1.3. GOVERNING STANDARDS.** Except as modified or supplemented herein, all gates and operators shall conform to the applicable requirements of AWWA C501's, latest edition.

#### 1.4. QUALITY ASSURANCE

**1.4.1.** The manufacturer shall have experience in the production of substantially similar equipment, and shall show evidence of satisfactory operation in at least 50 installations. The manufacturer's shop welds, welding procedures and welders shall be qualified and certified in accordance with the requirement of the latest edition of ASME, Section IX.

**1.4.2.** Weir gates shall be shop inspected for operation before shipping.

**1.4.3.** The manufacturer shall be ISO 9001 certified.

**1.5. SUBMITTALS.** The manufacturer shall submit, for approval by the purchaser, drawings showing the principal dimensions, general construction and materials used in the gate and lift mechanism.

### 2. PERFORMANCE

**2.1. LEAKAGE.** Weir gates shall be substantially watertight under the design head conditions. Leakage shall not exceed 0.05 gallon per minute per foot ( $1.04 \times 10^{-5} \text{ m}^3 / \text{s}$  per meter) of seal periphery under the design seating head and 0.1 gallon per minute per foot ( $2.07 \times 10^{-5} \text{ m}^3 / \text{s}$  per meter) of seal periphery for the design unseating head.

**2.2. DESIGN HEAD.** Weir gates shall be designed to withstand the design head (maximum design head shall be taken as the height of the slide unless otherwise shown in the schedule).

**2.3. SEAL PERFORMANCE TEST.** The weir gate's sealing system should have been tested through a cycle test in an abrasive environment and should show that the leakage requirements are still obtained after 25,000 cycles with a minimum deterioration.

### 3. PRODUCT

#### 3.1. WEIR GATES

**3.1.1. GENERAL DESIGN.** Weir gates shall be either self-contained or non self-contained, of the rising stem or non-rising stem configuration as indicated on the gate schedule.

**3.1.3. FRAME.** The gate frame shall be constructed of structural members or formed plate welded to form a rigid one piece-frame. The frame shall be of the flange back design suitable for mounting on a concrete wall (CW). The guide slot shall be made of UHMWPE (ultra high molecular weight polyethylene).

**3.1.4. SLIDE.** The slide shall consist of a flat plate reinforced with formed plates or structural members to limit its deflection to 1/720 of the gate's span under the design head.



## SERIES 40

### DOWNWARD-OPENING WEIR GATES

**3.1.5 GUIDES AND SEALS.** The guides shall be made of UHMWPE (ultra high molecular weight polyethylene) and shall be of such length as to retain and support at least two thirds (2/3) of the vertical height of the slide in the fully open position.

The bottom and side seals shall be made of UHMWPE (ultra high molecular weight polyethylene) of the self adjusting type. A continuous compression cord shall ensure contact between the UHMWPE guide and the gate in all positions. The sealing system shall maintain efficient sealing in any position of the slide and let the water flow only in the opened part of the gate.

Seals shall maintain the specified leakage rate in both seating and unseating conditions.

### 3.2. OPERATORS AND STEM

**3.2.1. STEM AND COUPLINGS.** The operating stem shall be of stainless steel designed to transmit in compression at least 2 times the rated output of the operating manual mechanism with a 40 lb (178 N) effort on the crank or handwheel.

The stem shall have a slenderness ratio (L/R) less than 200. The threaded portion of the stem shall have machined cut threads of the Acme type.

Where a hydraulic, pneumatic or electric operator is used, the stem design force shall not be less than 1.25 times the output thrust of the hydraulic or pneumatic cylinder with a pressure equal to the maximum working pressure of the supply, or 1.25 times the output thrust of the electric motor in the stalled condition.

**3.2.1.1.** For stems in more than one piece and with a diameter of 1 ¼ inches (45 mm) and larger, the different sections shall be joined together by solid bronze couplings. Stems with a diameter smaller than 1 ¼ inches, shall be pinned to an extension tube.

The couplings shall be grooved and keyed and shall be of greater strength than the stem.

**3.2.1.2.** Gates having width equal to or greater than two times their height shall be provided with two lifting mechanisms connected by a tandem shaft.

**3.2.2. STEM GUIDES.** Stem guides shall be fabricated from type 304L (or 316L) stainless steel. The guide shall be equipped with an UHMWPE bushing. Guides shall be adjustable and shall be spaced in accordance with the manufacturer's recommendation. The L/R ratio shall not be greater than 200.

**3.2.3. STEM COVER.** Rising stem gates shall be provided with a clear polycarbonate stem cover. The stem cover shall have a cap and condensation vents as well as a clear mylar position indicating tape. The tape shall be field applied to the stem cover after the gate has been installed and positioned.

**3.2.4. LIFTING MECHANISM.** Manual operators of the types listed in the schedule shall be provided by the gate manufacturer.

All bearings and gears shall be totally enclosed in a weather tight housing. The pinion shaft of crank-operated mechanisms shall be constructed of stainless steel and supported by roller or needle bearings.

Each manual operator shall be designed to operate the gate under the maximum specified seating and unseating heads by using a maximum effort of 40 lb (178 N) on the crank or handwheel, and shall be able to withstand, without damage, an effort of 80 lb (356 N).

The crank shall be removable and fitted with a corrosion resistant rotating handle. The maximum crank radius shall be 15 inches (380 mm) and the maximum handwheel diameter shall be 24 inches (600 mm).

**3.2.5. YOKE.** Self-contained gates shall be provided with a yoke made of structural members or formed plates. The maximum deflection shall be 1/360 of the gate's span.



**4. MATERIALS**

Part	Material
Frame, yoke, stem guides, slide, stem extension	Stainless steel ASTM A-276 Type 304L or 316L
Guides, side and bottom seals, stem guide liner	Ultra high molecular weight polyethylene (UHMWPE) ASTM D-4020-96
Compression cord	Nitrile ASTM D-2000 M6BG 708, A14, B14, E014, E034
Threaded stem	Stainless steel ASTM A-276 Type 303 MX or 316
Fasteners	ASTM F593 and F594 GR1 for type 304 and GR2 for type 316
Pedestal, handwheel, crank	Tenzaloy aluminum
Gasket (between frame and wall)	EPDM ASTM 1056
Stem cover	Polycarbonate ASTM A-707
Lift nut, couplings	Manganese bronze ASTM B584 UNS-C86500

**5. SCHEDULE**

<b>Gate Identification</b>		
<b>Gate Type</b>		
<b>Size Width x Height</b>		
<b>Operating Floor Elevation</b>		
<b>I n v e r t Elevation</b>		
<b>Head (Seating / Unseating)</b>		
<b>Mounting</b>		

Gate Type: Open or self-contained

Mounting: CW- Mounted concrete wall

**6. EXECUTION**

**6.1. INSTALLATION.** Gates and appurtenances shall be handled and installed in accordance with the manufacturer's recommendations.

**6.2. FIELD TESTS**

**6.2.1.** Following the completion of each gate installation, the gates shall be operated through at least two complete open/close cycles. If an electric or hydraulic operator is used, limit switches shall be adjusted following the manufacturer's instructions.

**6.2.2.** Gates should be checked for leakage by the contractor (refer to the "Performance" section for approval criteria).