HEAVY DUTY SLIDE GATE

General
Fabricated stainless steel heavy duty service gates shall be fabricated from formed stainless steel plate and structural shapes. The size, quantity, gate configuration and operating conditions shall be as listed on the gate schedule. Design stress shall be the lesser of 1/5 of ultimate tensile and shear or ¾ of tensile yield strength. Maximum allowable deflection under rated load or head is 1/720th of span.

Manufacturer shall have proof of design test records in accordance with AWWA on file available for submittal. The gates shall be as manufactured by Hydro Gate Corp. or approved equal.

Manufacturer shall be experienced and in regular production of gates and water control equipment. Welders and procedures shall be certified according to AWS D1.6 or ASME Section IX.

The gate shall be fully shop assembled, adjusted, inspected and tested for operation and leakage before shipment.

The gate shall be cleaned with water blast or glass bead blast to remove weld splatter and discoloration and produce even texture. All edges and corners shall be free of sharp burrs.

Materials
Materials used in construction of gates shall be of type best suited for the application and shall conform to the following ASTM specifications:

Body
Stainless Steel, ASTM A276, Type 304 or 316 – specify on gate schedule.

Fasteners and Anchor Bolts
Stainless Steel, ASTM F593/F594 alloy group 1 (304)
Stainless Steel, ASTM F594/F594 alloy group 2 (316) – specify on gate schedule

Guides, Liner and Seals
UHMW PE (Ultra high molecular weight polymer)

Flush Bottom Seal/Loading Pads
Neoprene Rubber, ASTM D2000 grade 1BE625

Gate Construction
Slide
The slide shall be a weldment of plate with integrally formed reinforcements at top and bottom with welded-on interior reinforcements. The slide shall have at least one vertical reinforcement on or adjacent to the vertical center line. All edges and corners shall be radiused and polished for smooth operation within the guide seal assembly.

Provision shall be provided for attaching stems to the gate with a clevis-type connection. Alternatively: stem block connection shall be used when precise adjustment of hydraulic cylinders is required.

Frame
The frame shall be of flange type design for mounting on anchor bolts and grout pad. Size and spacing of anchor bolt holes shall be suitable for the operating conditions of the gate. Spacing shall not exceed 12".

The frame shall be of self-contained or not self-contained design as listed in the gate schedule. The frame shall be sufficiently rigid to transfer hydrostatic loads to the gate anchorage.

The frame shall positively retain the polymer guide/seal strip and the neoprene loading pad on studs welded to it. Non-loosening (prevailing torque) fasteners shall be used on the gate guide assembly. The guide seal assembly shall be field adjustable and replaceable. The length (vertical height) of the guide shall retain at least 2/3 of the slide height in the full open position.

Guide/Seal Assembly
Guide seal shall be special milled or molded polymer to positively retain the slide and form a tight seal on face plate edge. Sealing shall be accomplished by pinching action of the polymer guide/seal the elastometer loading pad and the fastener cover bar system. Engagement of slide into guide groove shall be 7/8" nominal.

Top Seal and Bottom Seal (if standard bottom)
The top and bottom (if used) seal shall be specially milled or molded shape securely attached to the frame. It shall have an elastomer loading pad to ensure contact with the slide plate. Corners or intersections of seals and loading pads shall be interlocked and sealed for leak-proof joint.

Flush Bottom Closure
Rectangular solid bulb section neoprene seal shall be attached to frame horizontal member. Sealing action shall be against lower edge of slide plate. The sealing face of neoprene seal shall form a chased invert.

Standard Bottom Closure
When specified by gate schedule, the gate shall be furnished with the special shaped polymer seal and loading pad on the gate frame lower member. The bottom edge of slide shall have integrally formed reinforcement and have gently ramped lead in surface to prevent damage to the seal.

Wedges
Gates 24" wide and wider shall have adjustable wedges across top of opening and across bottom of opening on standard bottom gate. Wedges may be fabricated or cast and shall be held onto slide reinforcing member with two inline welded studs with backing plate.

Yoke
The yoke or head frame may be welded or bolted to frame extensions. The slide shall be removable thru the yoke opening or by disassembly/removal of the yoke. Yoke shall be sufficiently strong to prevent deflection greater than ¼" under load.

Stems
Gate stem diameter shall be adequate to withstand twice the force created by a 40 lb. pull on the handwheel or crank. Stems shall have rolled threads with a maximum roughness of 16 micro inches. Cut threads are not acceptable. The stem shall be supported by angle guides or fabricated stainless steel, bronze bushed stem

guides, spaced to provide an 1/r ratio of 200 or less. Stems shall withstand 1.25 times the stalled motor thrust of the actuator.

Wall Thimbles
When thimbles are used, they shall be fabricated stainless steel with minimum thickness of ¼". The flange shall be flat and plane within 3/16" without machining. Welded studs or threaded holes for screwed in studs shall be provided to match the gate layout. The top of the thimble flange shall be permanently marked top. The thimble shall be set plumb and flat within 1/8" of true plane and plumb. The gate shall be mounted with hard setting mastic or polyurethane closed cell foam gasket of no more than ½" uncompressed thickness. Refer to the gate schedule for type and application of wall thimbles.

Manual Lifts
Gate lifts shall be handwheel or geared crank type as shown in the gate schedule. Lifts shall operate the gate with a maximum pull of 40 lb. on the handwheel or crank. Handwheel or crank shall be located approximately 36" above grating or walkway. All lifts shall have thrust bearings, bronze lift nuts and a bronze stop nut to limit the downward travel of the stem and slide. All geared lifts shall have cast iron or steel housing and pedestals. Aluminum housing and pedestals shall not be acceptable. All lifts shall be rising stem type. Stem covers made of clear butyrate shall be furnished for all lifts. Lifts shall be grease lubricated and regreaseable through grease zerks. Oil bath lifts are not acceptable.

Motor Operated Lifts
Motor operator shall be a 460-V, 3 phase, 60-H motor with precision reduction gearing enclosed in weather-proof housing. The operator shall be designed to raise the gate at a rate of approximately 12 in/min. Integral controls shall include a control power transformer, reversing controller, torque switches, space heater to prevent condensation, open-stop-closed push buttons.

Installation
The gate and accessories shall be installed according to manufacturer's recommendation. The gate shall be clean and free of construction debris and stem threads shall be lubricated prior to operation of the gate. If electric motor operator is used, limit switches shall be adjusted according to manufacturer's instructions. If hydraulic cylinder is used, the rod or stem connection shall be adjusted for correct stroking and closing action. The gate shall be cycled minimum of 1-1/2 cycles (open-close-open or vise versa) to ensure smooth operation. The gates may be field leak tested by the contractor. Leakage shall not exceed .05 gpm per foot of perimeter at the rated head, seating or unseating. Consult installation drawing for pressure rating of the specific gate.

Approved manufacturer shall be Hydro Gate or pre-approved equal.