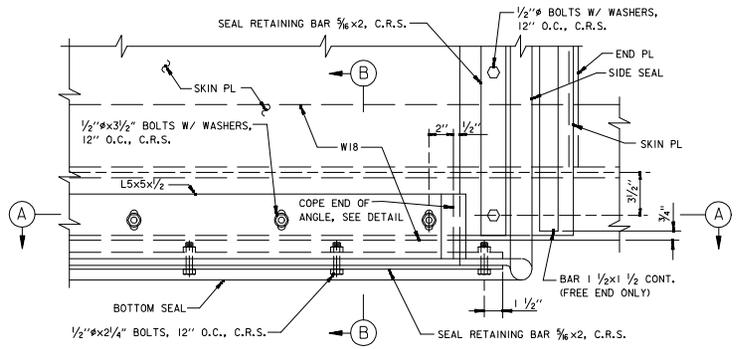


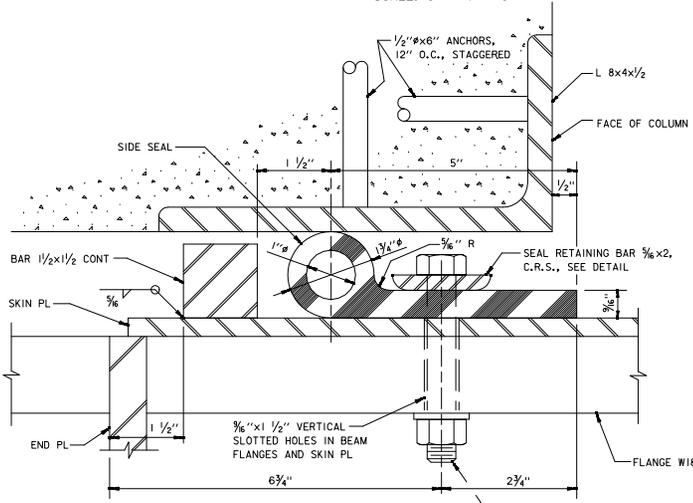
TYPICAL SECTION THRU SWING GATE

SCALE: 3" = 1' - 0"



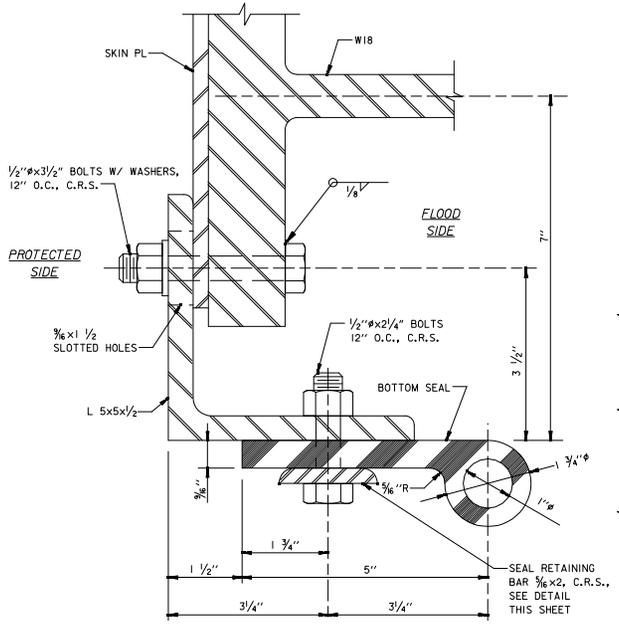
BOTTOM CORNER ELEVATION - PROTECTED SIDE

SCALE: 3" = 1' - 0"



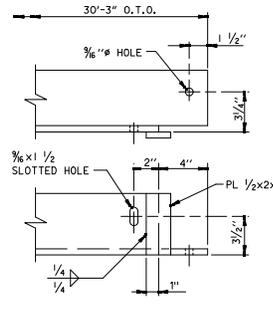
DETAIL 1

SCALE: 12" = 1' - 0"



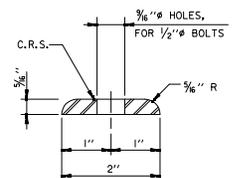
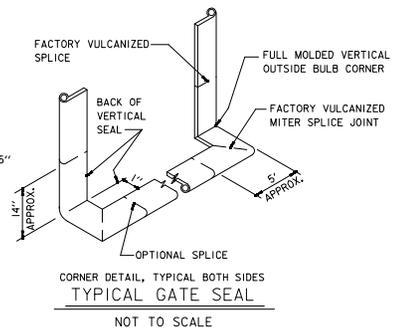
SECTION B

SCALE: 12" = 1' - 0"



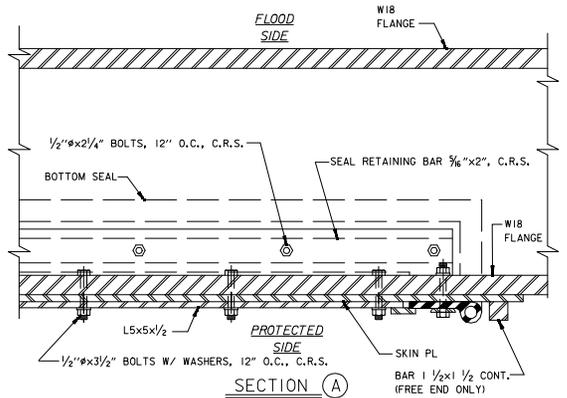
END OF L 5x5x1/2

SCALE: 3" = 1' - 0"



SEAL RETAINING BAR

SCALE: 12" = 1"



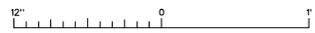
SECTION A

SCALE: 3" = 1' - 0"

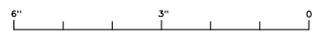
NOTES:

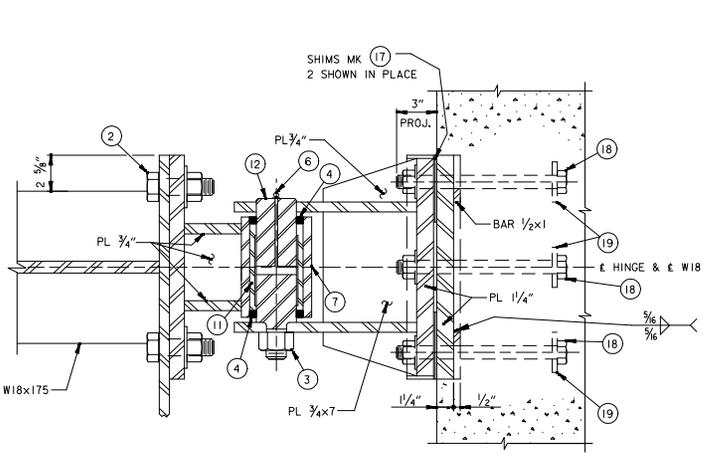
- FOR GENERAL NOTES, SEE DWG. I-4.
- ALL SPLICES WILL BE FACTORY MADE IN HEAVY STEEL PRESS TYPE MOLDS UNDER PRESSURE AND HEAT.
- ALL SPLICE JOINTS MUST DEVELOP STRENGTH OF AT LEAST 50% OF THE MINIMUM TENSILE STRENGTH REQUIRED OF THE RUBBER.
- SEAL CLAMP ANGLES SHALL BE PAINTED ON ALL SIDES PRIOR TO ASSEMBLY.
- AFTER ASSEMBLY AND SEAL ADJUSTMENTS ARE MADE, ALL GAPS IN SEALS AND SEAL SUPPORTS SHALL BE SEALED WITH A SILICONE RUBBER SEALANT TO PROVIDE WATERTIGHT JOINTS.

SCALE: 3" = 1' - 0"

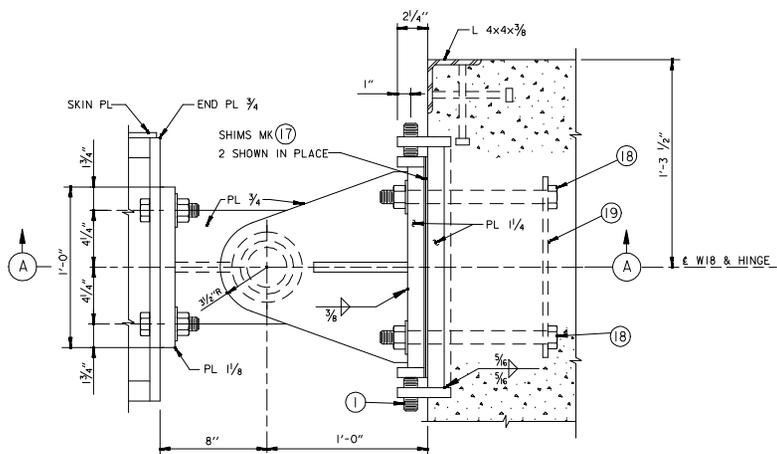


SCALE: 12" = 1' - 0"



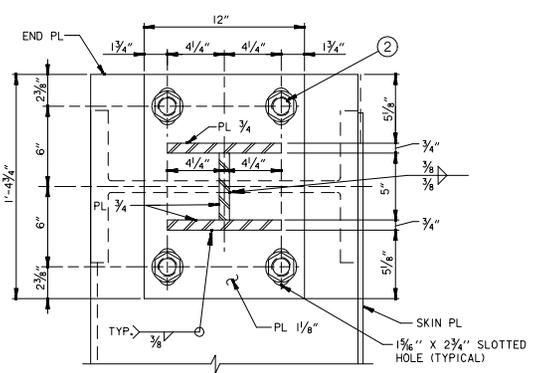


SECTION A
SCALE: 3" = 1'-0"

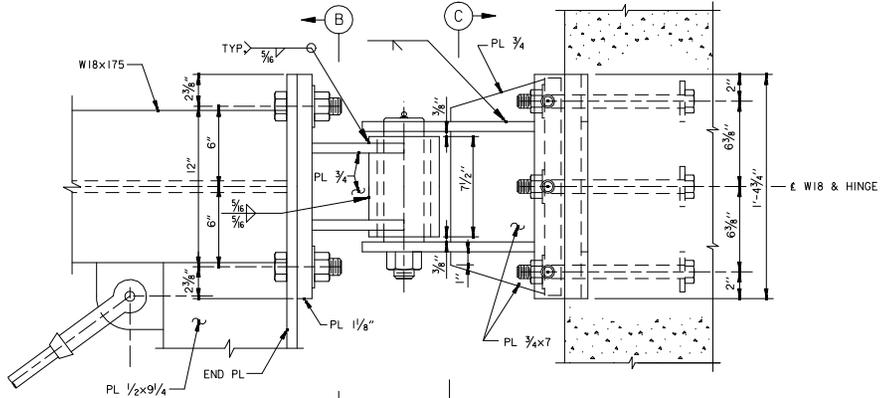


PLAN

- NOTES:
1. (18) NUMBER INSIDE CIRCLE DENOTES PART NUMBER FOR HINGE.
 2. MARK NUMBERS (1) THRU (9) NOT DETAILED.

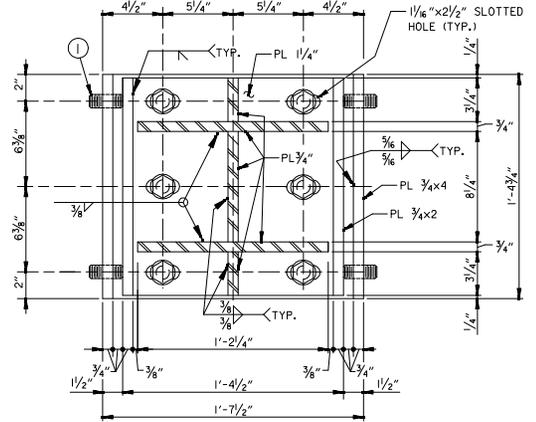


SECTION B
SCALE: 3" = 1'-0"

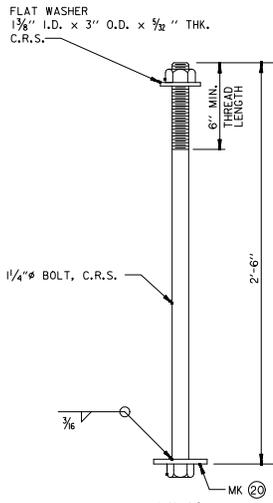


ELEVATION

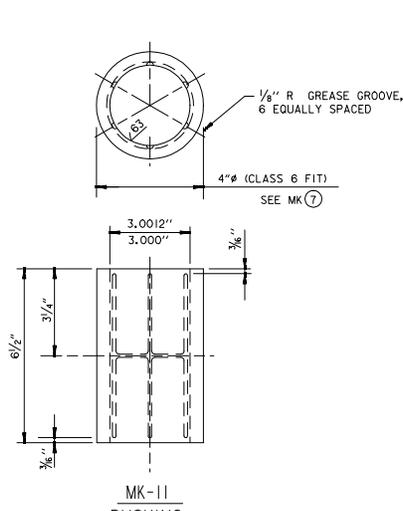
UPPER HINGE
SCALE: 3" = 1'-0"



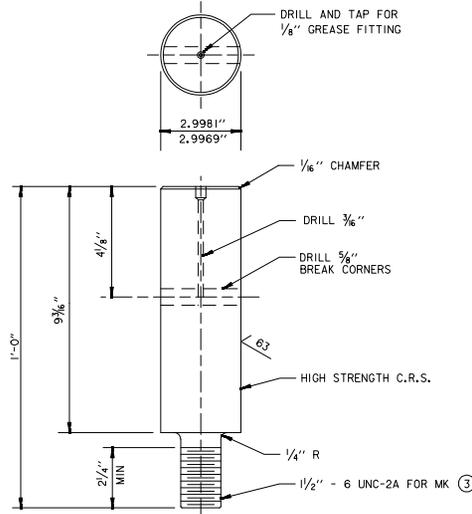
SECTION C
SCALE: 3" = 1'-0"



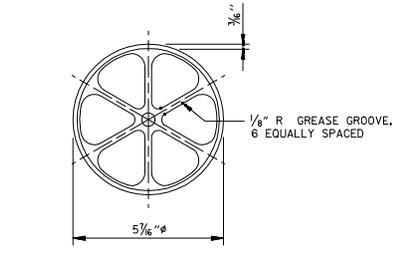
MK-10
ANCHOR BOLT
SCALE: 3" = 1' - 0"



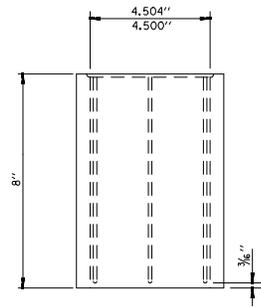
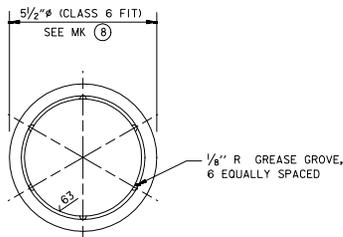
MK-11
BUSHING
SCALE: 6" = 1' - 0"



MK-12
UPPER HINGE SHAFT.
SCALE: 6" = 1' - 0"

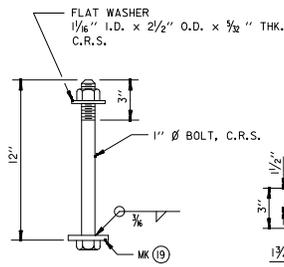


MK-13
THRUST WASHER
SCALE: 6" = 1' - 0"

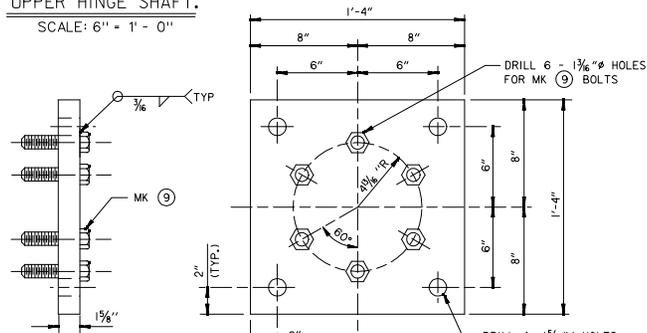


MK-17
SHIM
SCALE: 3" = 1' - 0"

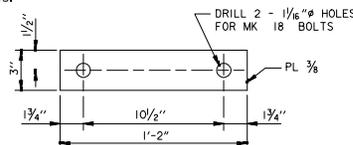
MK-14
BUSHING
SCALE: 6" = 1' - 0"



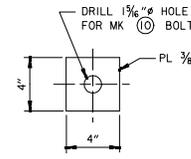
MK-18
ANCHOR BOLT
SCALE: 3" = 1' - 0"



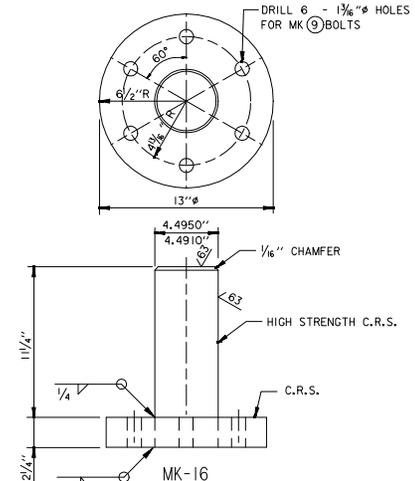
MK-15
BASE PLATE
SCALE: 3" = 1' - 0"



MK-19
PLATE
SCALE: 3" = 1' - 0"



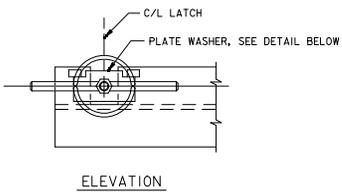
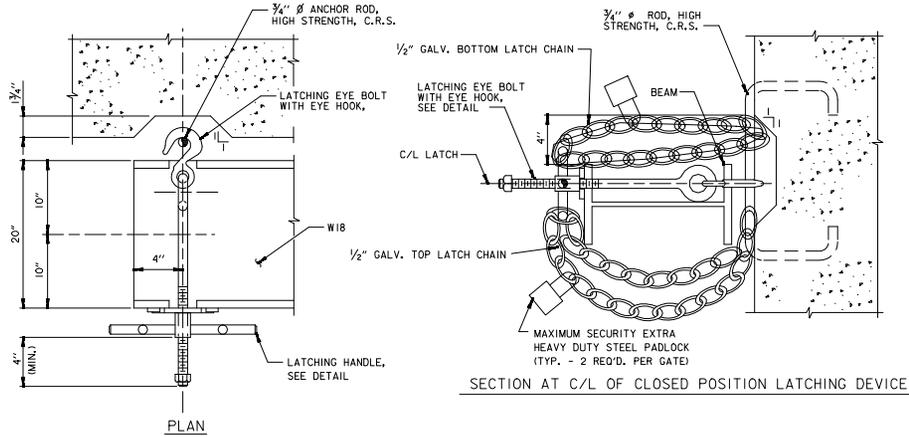
MK-20
PLATE
SCALE: 3" = 1' - 0"



MK-16
BEARING PEDESTAL
SCALE: 3" = 1' - 0"

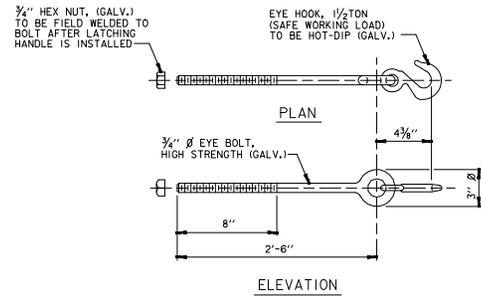
MARK NO.	QUANTITY	DESCRIPTION	MATERIAL
PARTS NOT DETAILED			
1	4	SET SCREW - HEX SOCKET, 1" Ø X 2 1/2" LONG, CLASS 3A, FLAT POINT	FED. SPEC. FF-S-200A(2) C.R.S., ALLOY 304
2	4	1 1/4" X 4" LONG HEX BOLT WITH NUT AND FLAT WASHER 1 3/8" I.D. X 3" O.D. X 3/32" THK.	ASTM A193/A193M-01B, CLASS 2, GRADE 8M, STRAIN-HARDENED
3	1	NUT, HEAVY HEX 1 1/2" - 6 UNC-2B, W/ FLAT WASHER 1 3/8" I.D. X 3 1/2" O.D. X 3/32" THK.	ASTM A194/A194M-01G, GRADE 8M, STRAIN-HARDENED
4	2	GREASE SEAL, GARLOCK KLOZURE NO. 63 - 2176 OR EQUAL	COMMERCIAL GRADE
5	1	GREASE SEAL, GARLOCK KLOZURE NO. 53 - 2753 OR EQUAL	COMMERCIAL GRADE
6	2	GREASE FITTING, 1/8" N.P.T. TYPE	COMMERCIAL GRADE
7	1	MECHANICAL TUBING, 6 3/4" O.D. X 5 1/2" I.D. X 9 1/2" LONG MACHINED FOR CLASS 6 FIT BETWEEN I.D. OF TUBING AND O.D. OF MK-11 BUSHING	A-513, TYPE 6
8	1	MECHANICAL TUBING, 6 3/4" O.D. X 4" I.D. X 7 1/2" LONG MACHINED FOR CLASS 6 FIT BETWEEN I.D. OF TUBING AND O.D. OF MK-14 BUSHING	A-513, TYPE 6
9	6	1 1/2" Ø X 5 1/2" LONG HEX BOLT WITH NUT AND FLAT WASHER 1 3/8" I.D. X 2 3/4" O.D. X 3/32" THK.	SAME AS MARK NO. 2
-PARTS DETAILED-			
10	4	1 1/4" Ø X 2'-8" LONG HEX BOLT WITH NUT & FLAT WASHERS	SAME AS MARK NO. 2
11	1	BUSHING, 4" O.D. X 3" I.D. X 8 1/2" LONG	B-22, NO.937
12	1	UPPER HINGE SHAFT, 2.999" O.D. X 12" LONG	A-276, TYPE 431
13	1	THRUST WASHER, 5 3/8" Ø WITH 1/2" HOLE	B-22, NO.937
14	1	BUSHING, 5 1/2" O.D. X 4 1/2" I.D. X 8" LONG	B-22, NO.937
15	1	BASE PLATE 1 3/8" X 16" X 1'-4"	STEEL A-36
16	1	BEARING PEDESTAL SHAFT, 4 1/2" Ø X 13 1/2" LONG	A-276, TYPE 304 A 276, TYPE 431
17	AS REQ'D	SHIM PLATE 1/8" X 5 X 1'-2 1/4"	STEEL A-36
18	6	1" Ø X 12" LONG HEX BOLT WITH NUT & WASHER	SAME AS MARK NO. 2
19	3	PLATE 3/8" X 3 X 1'-2"	STEEL A-36
20	4	PLATE 3/8" X 4 X 0'-4"	STEEL A-36

NOTE: QUANTITIES SHOWN ARE FOR ONE COMPLETE SWING GATE.



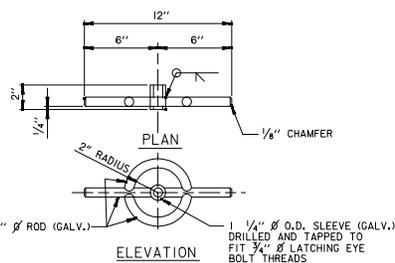
DETAIL 1
CLOSED POSITION LATCHING DEVICE

SCALE: 3" = 1' - 0"



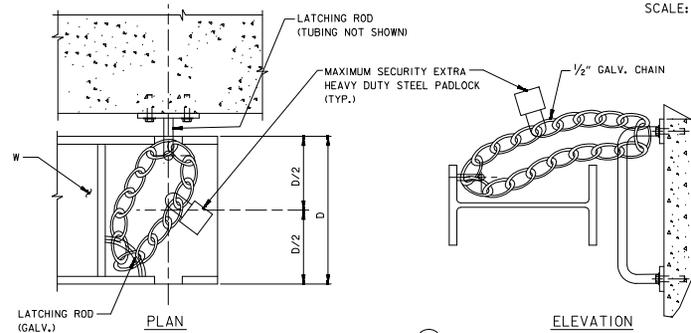
LATCHING EYE BOLT W/ EYE HOOK

SCALE: 3" = 1' - 0"



LATCHING HANDLE

SCALE: 3" = 1' - 0"



DETAIL 2
STORED POSITION LATCHING DEVICE

NOTES:

SCALE: 3" = 1' - 0"

1. ENTIRE LATCHING SYSTEM TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.

2. (2) CHAINS & (2) PADLOCKS ARE REQUIRED PER GATE.

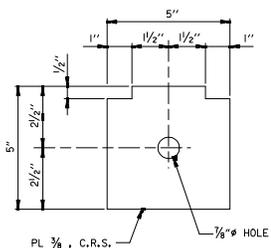
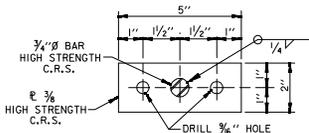


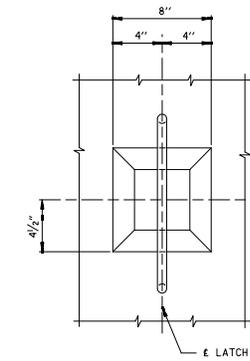
PLATE WASHER

SCALE: 6" = 1' - 0"



LATCHING ROD PLATE

SCALE: 6" = 1' - 0"

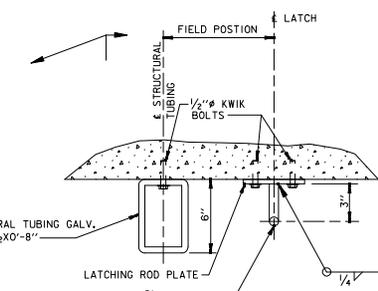
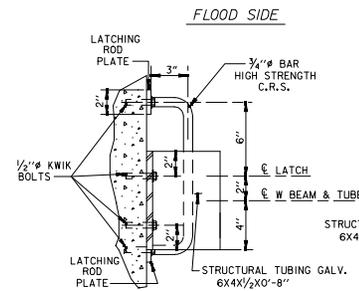


CLOSED POSITION LATCH DETAIL

SCALE: 3" = 1' - 0"



PROTECTED SIDE

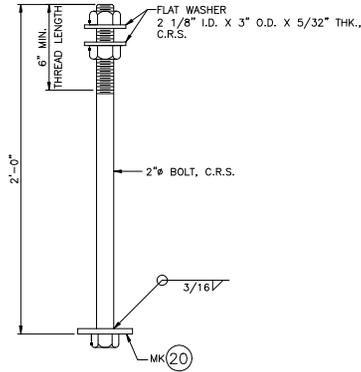


FLOOD SIDE

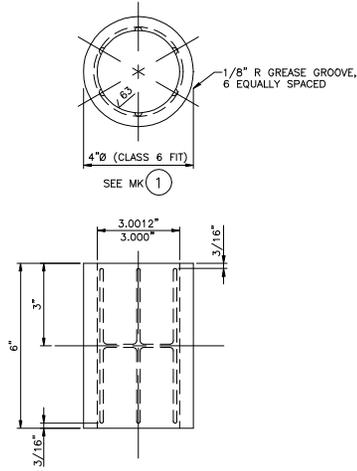
DETAIL 1

SCALE: 3" = 1' - 0"

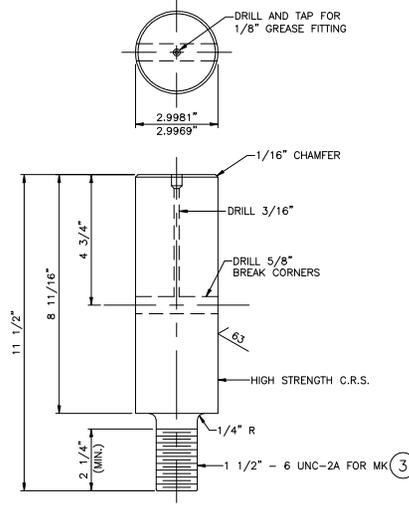
PROTECTED SIDE



MK-10
ANCHOR BOLT
SCALE: 3" = 1'-0"



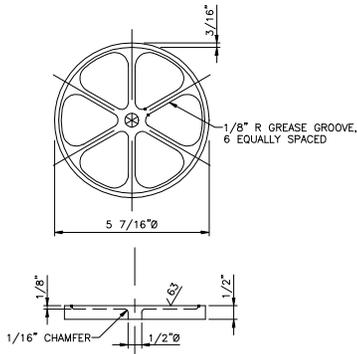
MK-11
BUSHING
SCALE: 6" = 1'-0"



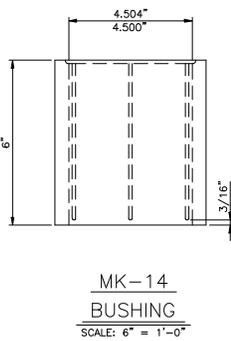
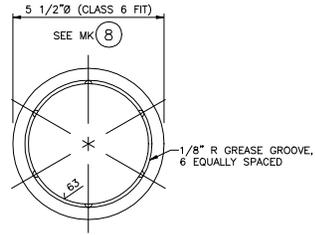
MK-12
UPPER HINGE SHAFT
SCALE: 6" = 1'-0"

MARK NO.	QUANTITY	DESCRIPTION	MATERIAL
PARTS NOT DETAILED			
1	4	SET SCREW - HEX SOCKET, 1/8" X 2 1/2" LONG, CLASS 3A, FLAT POINT	FED. SPEC. FF-5-200A(2) C.R.S., ALLOY 304
2	10	1/8" X 3" LONG HEX BOLT WITH NUT AND FLAT WASHER 1 1/16" I.D. X 2 1/2" O.D. X 5/32" THK.	ASTM F593, GROUP 2, ALLOY 316, CONDITION CW
3	1	NUT, HEAVY HEX 1 1/2" - 6 UNC-2B, W/ FLAT WASHER 1 5/8" I.D. X 3 1/2" O.D. X 3/16" THK.	ASTM F594, GROUP 2, ALLOY 316, CONDITION CW
4	2	GREASE SEAL, GARLOCK KLOZURE NO. 63 - 2176 OR EQUAL	COMMERCIAL GRADE
5	1	GREASE SEAL, GARLOCK KLOZURE NO. 53 - 2753 OR EQUAL	COMMERCIAL GRADE
6	2	GREASE FITTING, 1/8" N.P.T. TYPE	COMMERCIAL GRADE
7	1	MECHANICAL TUBING, 5 1/4" O.D. X 4" I.D. X 7" LONG MACHINED FOR CLASS 6 FIT BETWEEN I.D. OF TUBING AND O.D. OF MK-11 BUSHING	A-513, TYPE 6
8	1	MECHANICAL TUBING, 6 3/4" O.D. X 5 1/2" I.D. X 7 1/2" LONG MACHINED FOR CLASS 6 FIT BETWEEN I.D. OF TUBING AND O.D. OF MK-14 BUSHING	A-513, TYPE 6
9	6	1/8" X 4" LONG HEX BOLT WITH NUT AND FLAT WASHER 1 1/16" I.D. X 2 1/2" O.D. X 5/32" THK.	SAME AS MARK NO. 2
-PARTS DETAILED-			
10	4	2/8" X 2'-0" LONG HEX BOLT WITH DBL. NUT AND FLAT WASHERS	SAME AS MARK NO. 2
11	1	BUSHING, 4" O.D. X 3" I.D. X 6" LONG	B-22, NO.937
12	1	UPPER HINGE SHAFT, 2.998" O.D. X 11 1/2" LONG	A-276, TYPE 431
13	1	THRUST WASHER, 5 7/16" WITH 1/2" HOLE	B-22, NO.937
14	1	BUSHING, 5 1/2" O.D. X 4 1/2" I.D. X 6" LONG	B-22, NO.937
15	1	BASE PLATE 1 1/4" X 14 1/2" X 1'-2 1/2"	STEEL A-36
16	1	BEARING PEDESTAL PLATE 1 3/4" X 12" SHAFT 4 1/2" X 10 1/2" LONG	A-276, TYPE 304 A 276, TYPE 431
17	AS REQ'D	SHIM PLATE 1/8" X 5" X 0'-12"	STEEL A-36
18	4	1/8" X 12" LONG HEX BOLT WITH NUT & WASHER	SAME AS MARK NO. 2
19	2	PLATE 3/8" X 3" X 0'-9"	STEEL A-36
20	4	PLATE 3/8" X 4" X 0'-4"	STEEL A-36

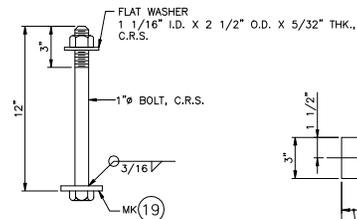
NOTE: QUANTITIES SHOWN ARE FOR ONE COMPLETE SWING GATE.



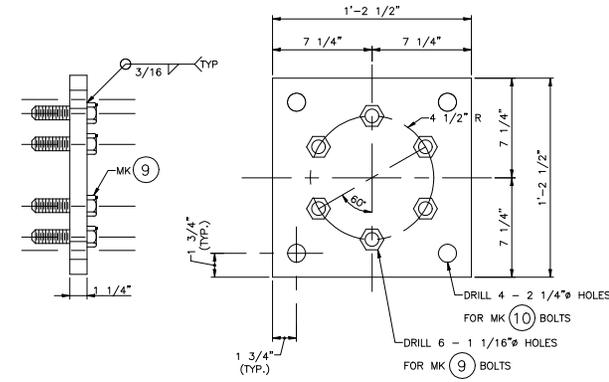
MK-13
THRUST WASHER
SCALE: 6" = 1'-0"



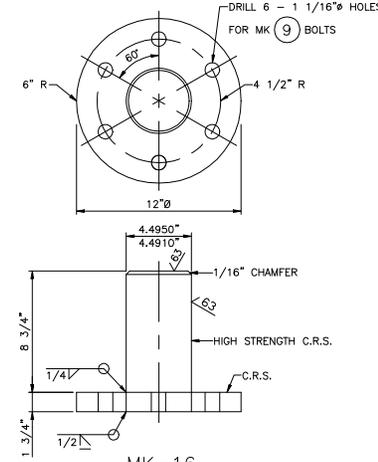
MK-14
BUSHING
SCALE: 6" = 1'-0"



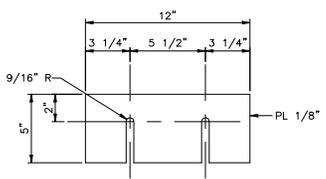
MK-18
ANCHOR BOLT
SCALE: 3" = 1'-0"



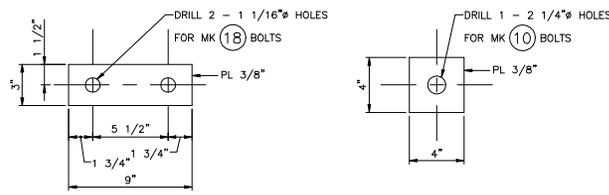
MK-15
BASE PLATE
SCALE: 3" = 1'-0"



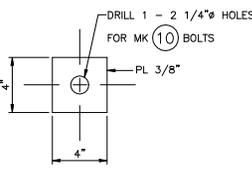
MK-16
BEARING PEDESTAL
SCALE: 3" = 1'-0"



MK-17
SHIM
SCALE: 3" = 1'-0"

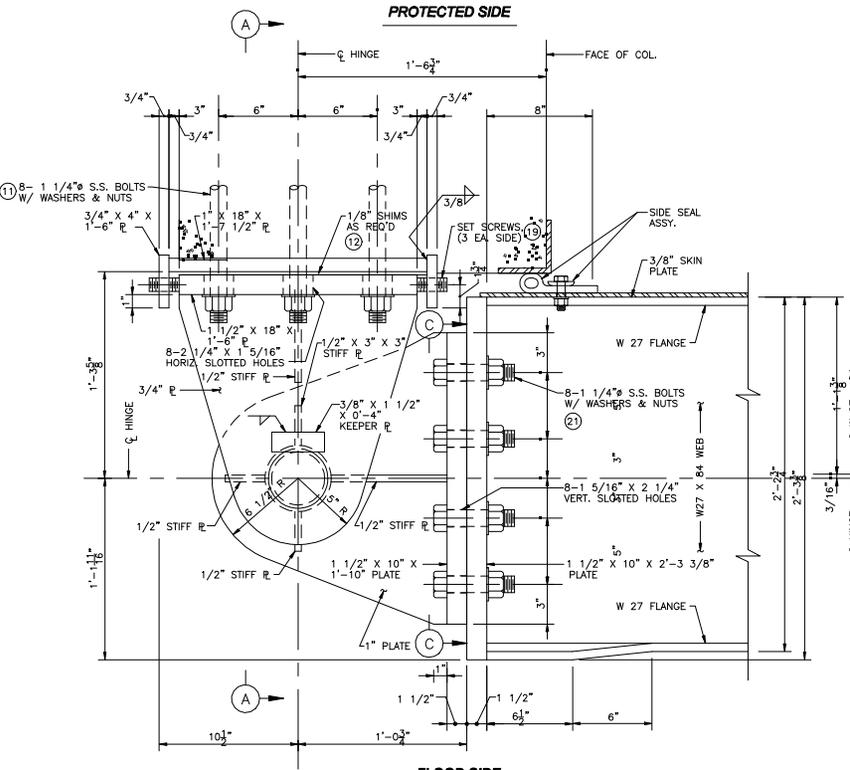


MK-19
PLATE
SCALE: 3" = 1'-0"



MK-20
PLATE
SCALE: 3" = 1'-0"

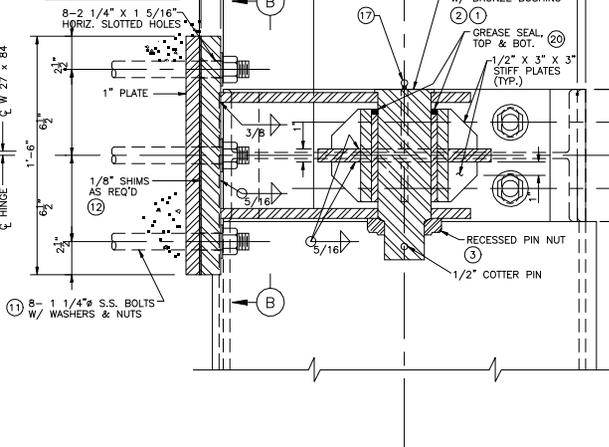
PROTECTED SIDE



FLOOD SIDE

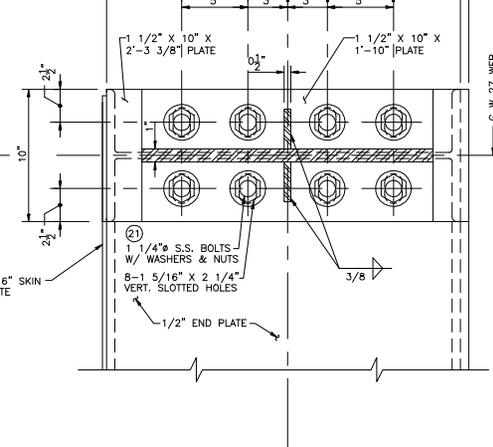
PLAN
SCALE: 3" = 1'- 0"

PROTECTED SIDE

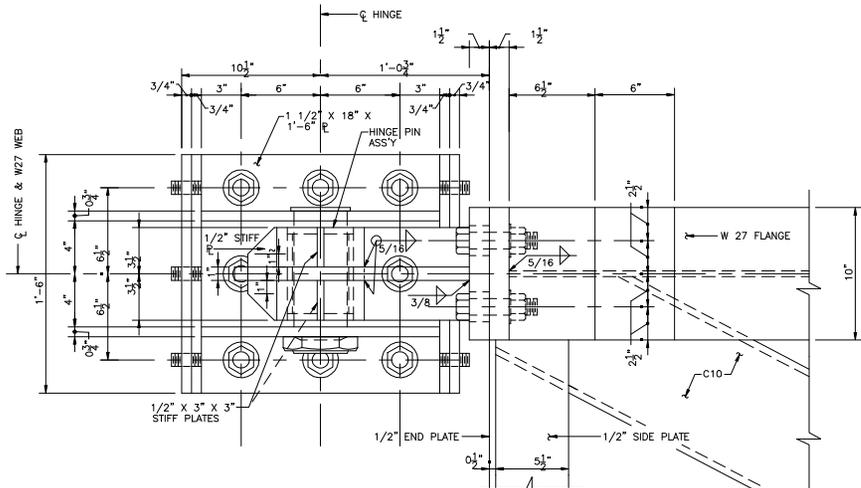


SECTION (A)
SCALE: 3" = 1'- 0"

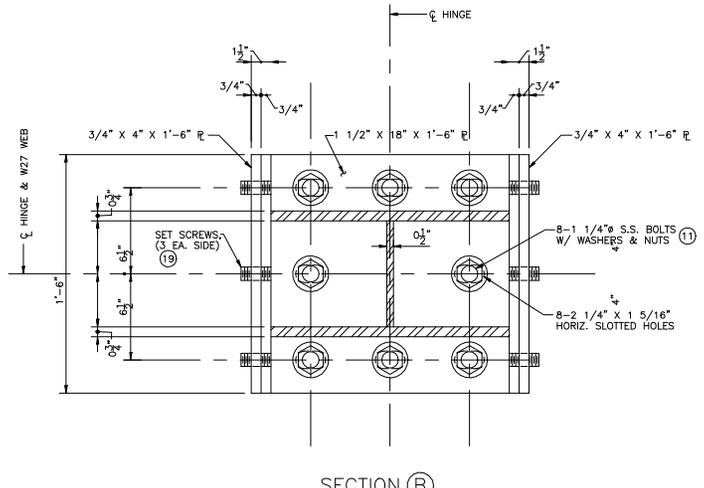
FLOOD SIDE



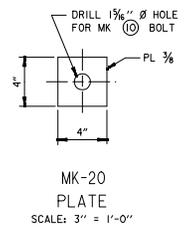
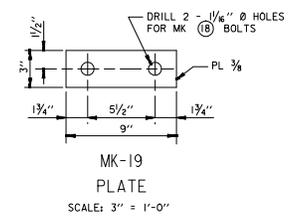
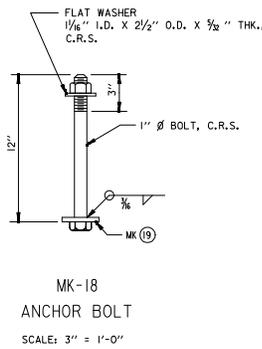
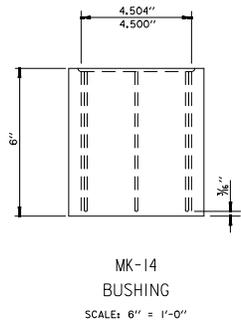
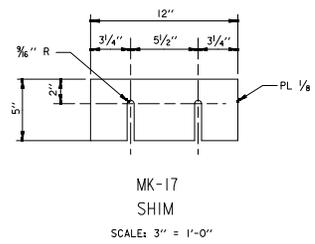
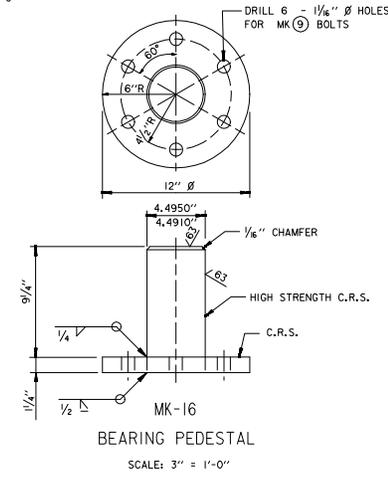
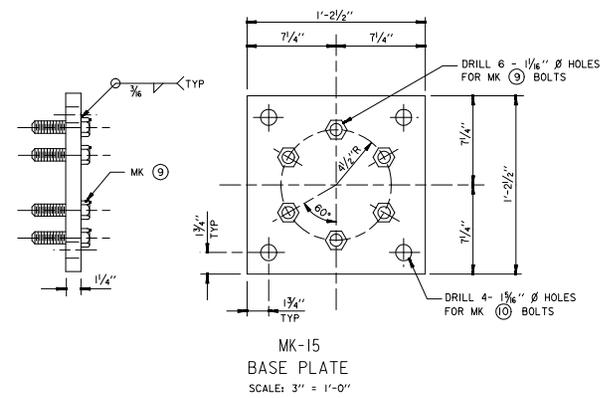
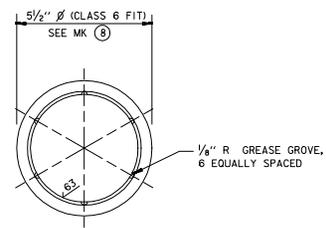
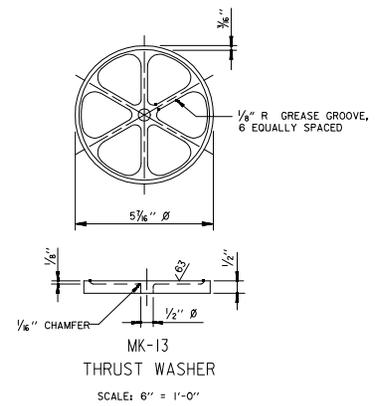
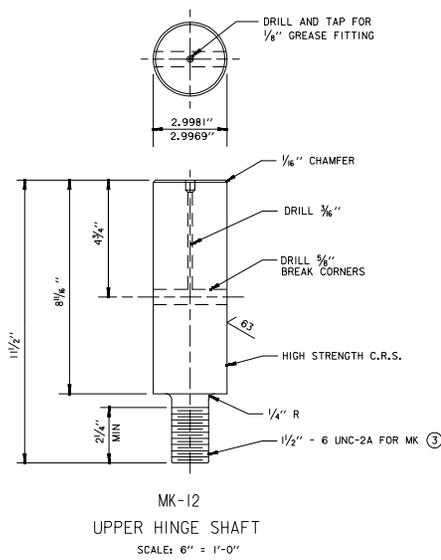
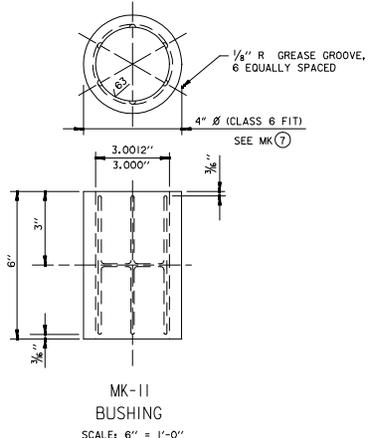
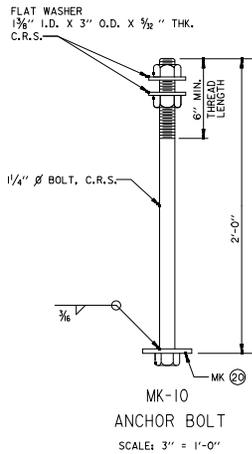
SECTION (C)
SCALE: 3" = 1'- 0"



ELEVATION
SCALE: 3" = 1'- 0"



SECTION (B)
SCALE: 3" = 1'- 0"



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SECTION 05520 - SWING GATES

PART 1 GENERAL

1.1 SCOPE

The work covered by this Section consists of furnishing all plant, shop drawings, equipment, labor and materials for furnishing and installing swing gates and all auxiliary items required for closing, sealing, latching, operating and storing these gates as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

SUBMITTAL PROCEDURES, Section 01330

CONTRACTOR QUALITY CONTROL, Section 01451

MISCELLANEOUS METALWORK, Section 05500

METALWORK FABRICATION, MACHINE WORK, AND MISCELLANEOUS PROVISIONS, Section 05501

PAINTING, Section 09940

1.3 BIDDING SCHEDULE LINE ITEMS

1.3.1 Swing Gate

Bidding Schedule Line Items for "Swing Gates" and "Pedestrian Gates" will constitute full compensation for furnishing, fabricating, shop and field painting, assembling, and placing the structural steel required by these specifications, and testing the operation of the gate. Structural steel for the gate includes girders, ribs, skin plates, stiffeners, gussets, bars, shims, angles, plates, seal plate, seal retaining bar, and other structural carbon steel not otherwise indicated or specified and not covered in paragraph 1.3.2 below.

1.3.2 Miscellaneous Metals

Miscellaneous metals will be included in the applicable Bidding Schedule Line Item listed in Section 05500, "MISCELLANEOUS METALWORK".

1.4 REFERENCES

The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 36	(2005) Carbon Structural Steel
A 500	(2003a) Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
A 572	(2006) High-Strength Low-Alloy Columbium-Vanadium Structural Steel
A 992	(2006) Steel for Structural Shapes for Use in Building Framing
D 2240	(2005) Rubber Property-Durometer Hardness

1.5 QUALITY CONTROL

1.5.1 General

The Contractor shall establish and maintain quality control for gate operations to assure compliance with the requirements of this Section and maintain records of his quality control for all construction operations including, but not limited to the following:

- 1). Insure timely submittal of shop drawings.
- 2). Inspection on delivery of fabricated items for damage, defects and conformance with approved shop drawings.
- 3). Installation in conformance with manufacturer's recommendations and/or requirements.

1.5.2 Reporting

The original and two (2) copies of these records and tests, as well as the records of corrective action taken, shall be furnished to the Government daily. Format of the report shall be as prescribed in Section 01451, "CONTRACTOR QUALITY CONTROL."

1.6 SUBMITTALS

The following shall be submitted in accordance with Section 01330, "SUBMITTAL PROCEDURES".

1.6.1 Shop Drawings

The Contractor shall prepare and submit for approval of the Contracting Officer complete shop drawings and descriptive literature showing details of the swing gate required as indicated herein.

1.6.2 Manufacturer's Certification

The gate rubber seals shall be certified for compliance with oil specification requirements.

1.7 WORKMANSHIP

All metalwork fabrication and machine work shall comply with the applicable provisions of Section 05501, "METALWORK FABRICATION, MACHINE WORK, AND MISCELLANEOUS PROVISIONS". All parts shall be properly fabricated, assembled and installed to conform to the shapes, sizes and dimensions indicated on the approved shop drawings.

PART 2 PRODUCTS

2.1 MATERIAL GRADES, TYPES AND CLASSES

Materials for the gate shall be as follows:

PART	MATERIALS
W sections, skin plates, corner protection angles, angles, bars, plates and other structural steel not otherwise indicated or specified.	Structural steel as specified in paragraph 2.1.1.
Seal plate, and seal retaining bars, for floodwall gates	Corrosion resisting steel as specified in paragraph 2.1.2.
Auxiliary Items	As specified in Section 05500

2.1.1 Structural Steel

Structural steel for the gate shall conform to the applicable provisions of ASTM A 36. High strength structural steel shall conform to the applicable provisions of ASTM A 572, Grade 50 or ASTM A 992, Grade 50.

2.1.2 Corrosion Resistant Steel

The seal plates and seal retaining bars for gate shall be corrosion-resisting steel and shall comply with the provisions of paragraph 05500-2.1.1.

2.1.3 Structural Tubing - Column

Cold-Formed Welded or Seamless Carbon Steel Structural Tubing in accordance with ASTM A 500, Grade B.

2.2 AUXILIARY ITEMS

Auxiliary items shall be as specified in Section 05500, "MISCELLANEOUS METALWORK".

PART 3 EXECUTION

3.1 WORKMANSHIP

All metalwork fabrication and machine work shall comply with the applicable provisions of Section 05501, "METALWORK FABRICATION, MACHINE WORK, AND MISCELLANEOUS PROVISIONS". All parts shall be properly fabricated, assembled and installed to conform to the shapes, sizes and dimensions indicated on the approved shop drawings.

3.2 TRIAL OPERATION AND TEST

After erection and before final acceptance, the gate shall be operated back and forth between the stored position and the latched closed (sealed) position a sufficient number of times to demonstrate to the satisfaction of the Contracting Officer that the gate has been properly installed and adjusted as required by the specifications. The workmanship and adjustments shall be such that:

- (1) when unlatched, the gate will move freely;
- (2) when latched in the stored position, the gate will be securely fastened against movement in any direction; and,
- (3) when latched in the closed position, the gate will be securely fastened against movement in any direction.

Any defects disclosed during testing shall be promptly corrected without additional cost to the Government and the tests repeated until the gate has satisfactorily passed the tests.

3.3 SHOP PAINTING

Shop painting shall comply with the applicable provisions of Section 09940, "PAINTING".

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SECTION 15076 - STEEL PIPE AND FITTINGS FOR DISCHARGE PIPING

PART 1 GENERAL

1.1 SCOPE

The work covered by this Section consists of the Contractor furnishing all plant, equipment labor, and materials, and performing all operations in connection with the installation of the steel discharge pipe and fittings, appurtenant items, and accessories in accordance with these specifications.

1.2 RELATED WORK SPECIFIED ELSEWHERE

SUBMITTAL PROCEDURES, Section 01330

PAINTING, Section 09940

PIPING SPECIALTIES, Section 15120

1.3 BIDDING SCHEDULE LINE ITEMS

1.3.1 Steel Pipe and Fittings

Bidding Schedule Line Items for "Steel Pipe and Fittings for Discharge Piping – Pump No. 1", "Steel Pipe and Fittings for Discharge Piping – Pump No. 2", "Steel Pipe and Fittings for Discharge Piping – Pump No. 3", "Steel Pipe and Fittings for Discharge Piping – Pump No. 4", "Steel Pipe and Fittings for Discharge Piping – Pump No. 5", "Steel Pipe and Fittings for Discharge Piping – Pump No. 6", "Steel Pipe and Fittings for Discharge Piping – Pump No. 7", "Steel Pipe and Fittings for Discharge Piping – Pump No. 8", "Steel Pipe and Fittings for Discharge Piping – Pump No. 9", "Steel Pipe and Fittings for Discharge Piping – Pump No. 10" shall constitute full compensation for furnishing all labor, materials, and equipment including, but not limited to, all piping, elbow fittings, expansion couplings, flared discharge cone, stiffener plates, doubler plates, anchor studs, bell or cone support, bearing pads, pipe and fitting paint coating and liners as specified herein.

1.3.2 Pipe Supports

Piles and concrete for the pipe supports shall be will be included in the appropriate Bidding Schedule Line Items specified in Section 02365, "PRESTRESSED CONCRETE PILES" and Section 03301, "CAST-IN-PLACE STRUCTURAL CONCRETE".

1.3.3 Miscellaneous Metals

Bidding Schedule Line Item for miscellaneous carbon steel, galvanized steel, grating, handrails, castings or other miscellaneous metals shall be made at the applicable Bidding Schedule Line Item specified in Section 05500, "MISCELLANEOUS METALWORK".

1.4 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN PIPE INSTITUTE (API)

Spec 5L (2004) Line Pipe Specification

Std 1104 (2005) Standard for Welding, Pipelines and Related Facilities

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A36 (2005) Carbon Structural Steel

A139 (2004) Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

B16.5 (2003) Pipe Flanges and Flanged Fittings, NPS ½ Through NPS 24 Metric/Inch Standard

B16.25 (2003) Buttwelding Ends

B31.1 (2004) Power Piping

B31.3 (2004) Process Piping

AMERICAN SOCIETY OF MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL CODE (ASME BPVC)

Section IX (2004) Welding and Brazing Qualifications

AMERICAN WATER WORKS ASSOCIATION (AWWA)

- C207 (2001) Steel Pipe Flanges for Waterworks Service - Sizes 4 in. Through 144 in. (100 mm Through 3,600 mm)
- C208 (2001) Dimensions for Fabricated Steel Water Pipe Fittings

PIPE FABRICATION INSTITUTE STANDARD (PFI)

- ES-1 (2004) Internal Machining and Solid Machined Backing Rings for Circumferential Butt Welds

1.5 SUBMITTALS

The Contractor shall submit detailed layout drawings prior to piping work for review in accordance with provisions of Section 01330, "SUBMITTAL PROCEDURES".

1.5.1 Material List

The Contractor shall include lists of materials and details of construction. This shall be submitted with the layout drawing below.

1.5.2 Layout Drawings

The layout drawings shall be complete with a piping plan, support plan and thimble layout. The routing will be shown on the Task Order Drawings in a diagrammatic form and actual layout will be determined by the Contractor within the specified parameters and coordinated with structural and electrical items.

PART 2 PRODUCTS

2.1 MATERIALS, PIPE, FITTINGS AND COMPONENTS

2.1.1 General

The pipe shall be shipped to the jobsite completely fabricated so that as few joints as possible are field welded.

2.1.2 Pipe

All pipe shall conform to API Spec 5L, Grade B or ASTM A 139, Grade B and shall have the minimum thicknesses as listed below:

Pipe Size (I.D., inches)	Thickness (inches)
54	0.6875"
78	0.75
90	0.75
160	1.00

The pipe furnished shall be of uniform diameter and smooth outside surfaces suitable for a style 38 "Dresser" coupling specified in Section 15120, "PIPING SPECIALTIES". The discharge pipe shall be furnished with welded lugs which shall be provided at all dresser couplings to limit the possible pipe expansion.

2.1.3 Discharge Cone

The discharge cone shall be fabricated from steel of equal thickness to that of the discharge piping with a minimum yield strength of 36,000 pounds per square inch. (ASTM A 36)

2.1.4 Flanges and Outlets

All flanges and outlets shall conform to the requirements of AWWA C207 and AWWA C208.

2.1.5 Flared Discharge Elbow

The flared discharge elbow sections shall be fabricated to requirements of AWWA C208.

2.2 ACCESSORIES

A "Dresser" coupling, style 38, shall be furnished with the discharge assembly in accordance with the requirements of Section 15120, "PIPING SPECIALTIES".

2.3 FINISHES

All interior surfaces and exterior surfaces shall have a ten (10) mil coal tar epoxy (C-200) lining or coating after fabrication conforming to applicable requirements of Section 09940, "PAINTING". Exterior surfaces of all discharge piping shall be painted with coal tar epoxy as specified in Section 09940, "PAINTING".

PART 3 EXECUTION

3.1 WELDING

3.1.1 Qualification of Welding Procedure

All steel pipe welds, except as noted otherwise herein shall be made with a qualified welding procedure in accordance with Section IX of the ASME Boiler and Pressure Vessel Code, API Std. 1104, or ASME B31.1, whichever is applicable to the work involved

3.1.2 Qualification of Welders

Welded joints in process and service lines being constructed under the jurisdiction of ASME B31.3 shall be made with a qualified welding procedure by welding operators or welders qualified either in accordance with Section IX of the ASME Boiler and Pressure Vessel Code, API Std. 1104, or ASME B31.3, whichever is applicable to the work involved.

3.1.3 Welding Grooves

The ends of steel pipe and fittings to be erected with butt welded joints shall be beveled to form welding grooves in accordance with ASME B31.3, and with ASME B16.25. Such welding grooves are shown more fully detailed in PFI ES-1 for straight internal machining and accordingly shall be subject to approval. Welding grooves for butt welded joints in pipe of unequal wall thickness shall be beveled in accordance with ASME B31.3.

3.1.4 Backing Rings

Backing rings, which are required remain in place, shall not be used.

3.1.5 Cleaning of Grooves

Prior to welding the pipe bevel, all surfaces adjacent thereto shall be thoroughly cleaned of all scale, rust, grease, oil, or other foreign material.

3.1.6 Cleaning of Welds

All scale, rust, dirt, or other foreign matter shall be thoroughly removed from the ends of the pipe before tacking or welding. Wire brushing is generally sufficient for cleaning rusty surfaces, but all torch cut edges shall be hammered or scraped and wire brushed to remove oxide scale. All pipe and fabricated spools shall be thoroughly cleaned of any foreign matter before installing. Each length of pipe shall be examined thoroughly inside and, if necessary, shall be swabbed out before tacking in position. All slag or flux remaining on the bead of welding shall be completely

removed before laying down the next successive bead and at the completion of the weld.

3.1.7 Weld Quality

Butt welds shall have full penetration and complete fusion with a minimum of weld metal protruding on the inside of the pipe. All welds shall be of sound deposit with a straight line of fusion. The finished weld contour shall be uniform with the toe or edge of the weld merging smoothly into the base material. Butt welds shall have a slight reinforcement built up gradually from the toe or edge toward the center of the weld. Fillet welds may be slightly concave on the finished surface. No undercutting or overlapping is permitted. The bead shall be smooth in appearance and shall contain no valleys or indentations on the crest or at the edge. Deposited metal shall be free from folds, cold shuts, gas holes, or other defects. Upon completion of the weld, all oxide and slag on and around the weld shall be removed to allow proper application of coatings.

3.1.8 Defects in Welds

If any cracks or blow holes occur on the surface of any welding bead, they shall be chipped out with a round nosed chisel to remove the defect and present such a surface that complete fusion may be obtained with the next successive welding bead.