

VR Containment

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176-25 Union Turnpike Suite 175 Fresh Meadows NY 11366

HIGHLIGHTED AREAS TO BE INSERTED BY SPECIFYING ENGINEER

SECTION 08316 - WATERTIGHT GATES & BARRIERS FOR FLOOD & SPILL CONTROL

PART 1 GENERAL

1.1 WORK OF THIS SECTION

- A. THE WORK OF THIS SECTION INCLUDES PROVIDING ALL LABOR MATERIALS, TOOLS, EQUIPMENT AND ALL APPURTENANT WORK NECESSARY TO FURNISH DELIVER & INSTALL FLOODGATES & BARRIERS AS OUTLINED IN THE CONTRACT DRAWINGS.
- B. TYPES OF GATES & BARRIERS REQUIRED SHALL INCLUDE WATERTIGHT LIFT OUT DUAL INFLATABLE GASKET CONSTRUCTION,
- C. AS AN ALTERNATE SINGLE INFLATABLE – OR COMPRESSION GASKET GATES MAY BE OFFERED WITH APPROPRIATE CREDITS PASSED ON TO THE OWNER
- D. SIZE & LOCATION OF GATES & BARRIERS SHALL CONSIST OF

(INSERT PROPER AREAS)

AS INDICATED BY THE CONTRACT DRAWINGS.
- E. FLOOR MOUNTED OR FLOOR MOUNTED STORAGE RACKS, FOR STORING GATES.

1.2 RELATED SECTIONS

- A. THE WORK OF THE FOLLOWING SECTIONS APPLIES TO THE WORK OF THIS SECTION.
- B. OTHER SECTIONS OF THE SPECIFICATIONS, NOT REFERENCED BELOW, SHALL ALSO APPLY TO THE EXTENT REQUIRED FOR PROPER PERFORMANCE OF THIS WORK

1. SECTION

(INSERT PROPER SECTION #)

EXAMPLE: CAST-IN-PLACE CONCRETE
BOLTS & ANCHORING
CAULKING AND GASKETING
PAINT

1.3 CODES

- A. THE WORK OF THIS SECTION SHALL COMPLY WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY

(INSERT PROPER JURISDICTION)

- 1. UNIFORM BUILDING CODE

1.4 SHOP DRAWINGS AND SAMPLES

THE FOLLOWING SHALL BE SUBMITTED IN COMPLIANCE WITH SECTION

(INSERT PROPER SECTION)

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- A. PRODUCT DATA: CONTRACTOR SHALL SUBMIT MANUFACTURER'S PRODUCT SPECIFICATIONS, STANDARD DETAILS, CERTIFIED PRODUCT TEST RESULTS, INSTALLATION INSTRUCTIONS AND GENERAL RECOMMENDATIONS, AS - APPLICABLE TO MATERIALS AND FINISHES FOR EACH COMPONENT AND FOR TOTAL SYSTEM
- B. SAMPLES: CONTRACTOR SHALL SUBMIT THE FOLLOWING SAMPLES AND ACCOMPANYING DESCRIPTIVE DATA:
 - 1. FASTENERS: TWO OF EACH TYPE TO BE USED, WITH STATEMENT REGARDING INTENDED USE.
 - 2. CLOSURES: GASKET SEAL.
- C. SHOP DRAWINGS: CONTRACTOR SHALL SUBMIT SMALL SCALE LAYOUTS OF DOORS AND LARGE SCALE DETAILS OF EDGE CONDITIONS, JOINTS, COMERS, CUSTOM PROFILES, SUPPORT, ANCHORAGE, TRIM SECTIONS, CLOSURES AND SPECIAL DETAILS. DISTINCTION SHALL BE MADE BETWEEN FACTORY & FIELD ASSEMBLY WORK.
- D. ENGINEERING DATA: DESIGN CALCULATIONS, CERTIFIED BY A STRUCTURAL ENGINEER LICENSED THAT THE PROPOSED SPECIAL DOORS WILL MEET THE SPECIFIED DESIGN CRITERIA.

1. 5 EXPERIENCE & QUALIFICATIONS

MANUFACTURER'S QUALIFICATIONS: THE MANUFACTURER SHALL HAVE HAD AT LEAST FIVE YEARS' EXPERIENCE IN PRODUCING THE SPECIFIC GATES & BARRIERS INDICATED. EVIDENCE TO THAT EFFECT INCLUDING LIST OF INSTALLATIONS, DESCRIPTIONS, NAME & METHOD OF CONTACT SHALL BE PROVIDED

1.6 QUALITY ASSURANCE

SINGLE SOURCE RESPONSIBILITY: PROVIDE DOORS/GATES INCLUDING HARDWARE AND OTHER APPURTENANCES MANUFACTURED BY A SINGLE FIRM SPECIALIZING IN PRODUCING THIS TYPE OF WORK, UNLESS OTHERWISE ACCEPTABLE TO THE ENGINEER.

THE MANUFACTURER OR IT'S AUTHORIZED REPRESENTATIVE SHALL OBSERVE AND APPROVE THE INSTALLATION OF THE GATES & BARRIERS.

PART 2 - PRODUCTS

2.1 GENERAL

- A. PERFORMANCE TEST STANDARDS: CONTRACTOR SHALL PROVIDE GATES & BARRIERS THAT HAVE BEEN PRE TESTED AND CERTIFIED BY THE MANUFACTURER TO PROVIDE THE INDICATED RESISTANCE TO WATER INFILTRATION AND STRUCTURAL DEFLECTION AND FAILURE WHEN INSTALLED AS INDICATED AND WHEN TESTED IN ACCORDANCE WITH TEST PROCEDURES DESCRIBED HEREIN.
- B. THE FLOOD GATES / DOORS SHALL BE MODEL

(PLEASE SELECT & INSERT PROPER MODEL #)

MODEL #	DESCRIPTION	OPERATION	GASKET TYPE	MATERIAL
FG2004-I2-BH-ALM	BOTTOM HINGED FLOOD GATE, FLOOR MOUNTED	AIR HYDRAULIC OPERATED	DUAL INFLATABLE	ALUMINUM
FG2004-I2-LO-ALM	LIFT OUT FLOOD GATE	MANUAL – LIFT OUT	DUAL INFLATABLE	ALUMINUM
FG2004-CW2-LO-ALM	LIFT OUT FLOOD GATE	MANUAL – LIFT OUT	DUAL WIPER COMPRESSION	ALUMINUM
FG2004-DC -LO-ALM	LIFT OUT FLOOD GATE	MANUAL – LIFT OUT	SINGLE COMPRESSION DOG LEVER	ALUMINUM
FG2004-DC -LO- STL	LIFT OUT FLOOD GATE	MANUAL – LIFT OUT	SINGLE COMPRESSION DOG LEVER	MILD STEEL

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FG2004-DC - LO- SS	LIFT OUT FLOOD GATE	MANUAL – LIFT OUT	SINGLE COMPRESSION DOG LEVER	STAINLESS STEEL
FG2004-I2-H-ALM	HINGED FLOOD GATE	MANUAL – SWING	DUAL INFLATABLE	ALUMINUM
FG2004-CW2-H-ALM	HINGED FLOOD GATE	MANUAL – SWING	DUAL WIPER COMPRESSION	ALUMINUM
FG2004-DC - H-ALM	HINGED FLOOD GATE	MANUAL – SWING	SINGLE COMPRESSION DOG LEVER	ALUMINUM
FG2004-DC - H- STL	HINGED FLOOD GATE	MANUAL – SWING	SINGLE COMPRESSION DOG LEVER	MILD STEEL
FG2004-DC - H- SS	HINGED FLOOD GATE	MANUAL – SWING	SINGLE COMPRESSION DOG LEVER	STAINLESS STEEL
FG2004-I2 – OH- ALM	OVERHEAD GUILLOTINE GATE	WINCH OPERATED	DUAL INFLATABLE	ALUMINUM
FG2004-CW2 – OH- ALM	OVERHEAD GUILLOTINE GATE	WINCH OPERATED MOTOR OPERATED	DUAL WIPER COMPRESSION	ALUMINUM
FG2004-I2 – SLD - ALM	SLIDE GATE	SLIDE IN TRACK	DUAL INFLATABLE	ALUMINUM

2.2 MATERIALS

A. GATE / DOOR CONSTRUCTION

SELECT APPROPRIATE MATERIAL	
PANELS AND FRAMES ALUMINUM ASTM B209	SELECT 5052 H32, 5086, 6061 T-6.

B. GATE / DOOR STIFFENERS

SELECT APPROPRIATE MATERIAL	
EXTRUSIONS & SHAPES: ALUMINUM ASTM B209	SELECT 6061 T-6.

C. FASTENERS: 300 SERIES STAINLESS STEEL.

D. GASKET STYLE & TYPE:

SELECT APPROPRIATE APPLICATION				
GASKET TYPE	GATE OPERATION	LEAKAGE RATE	A.D.A APPROVED	VEHICULAR TRAFFIC
DUAL INFLATABLE	HINGED	ZERO	YES	YES
	DROP IN	ZERO	YES	YES

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	SLIDING	ZERO	YES	YES
DUAL COMPRESSION – WIPER TYPE	HINGED	ZERO - LOW LEAK	YES	YES
	DROP IN	ZERO - LOW LEAK	YES	YES
	SLIDING	ZERO - LOW LEAK	YES	YES
COMPRESSION – LEVER TYPE	HINGED	ZERO	NO	NO
	DROP IN	ZERO	YES	YES
	SLIDING	ZERO	YES	YES

SELECT APPROPRIATE MATERIAL	
DUAL INFLATABLE WITH AUTOMOTIVE AIR INFLATION STEM OPERATING RANGE 15-20 PSI ABLE TO WITHSTAND 40 PSI WITH AN INDEPENDENT 0-60 PSI PRESSURE GAUGE	NEOPRENE HYPALON, OR EQUAL.
DUAL WIPER COMPRESSION GASKETS	NEOPRENE HYPALON, OR EQUAL.
DOG OPERATED COMPRESSION GASKETS	NEOPRENE HYPALON, OR EQUAL.

E. EXPANSION ANCHOR BOLTS: SERIES 300 STAINLESS STEEL.

2.3 METAL FINISHES

SELECT APPROPRIATE FINISH
ALUMINUM PRODUCTS GATES & FRAMES – POWDER COAT PAINT COLOR PER MANUFACTURER'S STANDARDS (GRAY). OTHER COLORS MAY BE SELECTED BY OWNER.
FOR STEEL FRAME COMPONENTS ABRASIVE CLEAN, AND APPLY ONE COAT OF SHOP PRIMER.
FOR STAINLESS STEEL FRAME COMPONENTS ABRASIVE CLEAN, UTILIZING GLASS BEAD, SAND BLAST METHOD OR ACID WASH AT THE OPTION OF THE MANUFACTURER.

2.4 DESIGN CRITERIA

2.4.1 DESIGN

- A. THE GATES & BARRIERS FRAME AND SKIN SHALL BE DESIGNED IN ACCORDANCE WITH THE SPECIFICATIONS AS PUBLISHED BY THE ASTM ASSOCIATION AND DESIGNED FOR LIVE OPERATIONAL LOAD IN ACCORDANCE WITH THE UNIFORM BUILDING CODE LATEST EDITION AS APPLICABLE FOR THIS LOCATION. DEFLECTION SHALL BE LESS THAN OR EQUAL TO L/240 UNDER LIVE LOAD CONDITION.
- B. GATES & BARRIERS SHALL BE DESIGNED WITH A MINIMUM 2: 1 FACTOR OF SAFETY BASED ON MATERIAL YIELD STRENGTH.
- C. GATES & BARRIERS SHALL BE DESIGNED TO CONFORM TO THE –FOLLOWING CRITERIA FOR WATER PENETRATION INFILTRATION:
- D. WATER PENETRATION: NO LEAKAGE AT MAXIMUM GATE HEIGHT OF WATER HEAD STANDING WATER.
- E. DESIGN FLOOD PROTECTION SYSTEM TO RESIST HYDROSTATIC HEAD TO (**INSERT**) ELEVATION BASED ON (**REFERENCE DATUM OR OTHER DETERMINATION FACTOR**) IN (**ONE / OR BOTH DIRECTION**)
- F. GATES & BARRIERS SHALL MEET OR EXCEED ACOE STANDARDS IDENTIFIED AS TYPE 2

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CLOSURES IN CHAPTER 7 SECTION 701 1.2 EP 1165-2-314 12/15/1995

2.4.2 CONSTRUCTION:

- A. STIFFENER ANGLES SHALL BE WELDED TO PANEL UNDERSIDE AND CONCEALED FROM VIEW. BOLTED OR RIVETED CONSTRUCTION IS NOT ACCEPTABLE.
- B. THE DIRECT ATTACHMENT OF PANELS TO THE SURFACE OF FRAME MEMBERS BY MEANS OF BOLTS, SCREWS OR SELF-DRILLING FASTENERS EXTENDING THROUGH THE PANELS, OTHER TOP FLANGES, OR OUTER EDGES OF THE PANEL WILL NOT BE ACCEPTABLE
- C. HINGED GATES & BARRIERS (WHERE APPLICABLE) SHALL BE HINGED TO ASSURE PROPER AND SMOOTH SWING OF THE PANEL UP TO 180 DEGREES OR TO THE EXTENT THAT HOLD BACK OR RESTRICTIVE MECHANISMS MAY APPLY.
- D. HINGES FOR COMPRESSION STYLE GATES & DOORS SHALL HAVE SLOTTED HOLES TO PROTECT THEM FROM SEAL PRESSURE LOADS.
- E. SEAL LOADS SHALL NOT BE TRANSMITTED TO THE HINGES.
- F. HINGE PINS AND WASHERS SHALL BE OF 304 STAINLESS, UNLESS OTHERWISE SPECIFIED.
- G. THE GATES & BARRIERS SHALL BE EQUIPPED WITH STAINLESS STEEL LATCHING DEVICES.
- H. THE NUMBER SIZE AND LOCATION OF THE LATCHES WILL BE DICTATED BY THE GATE SIZE AS WELL AS THE SPECIFIED DESIGN CONDITIONS.
- I. MAXIMUM HEIGHT ALLOWED FOR ACTIVATING ANY LATCHES SHALL BE 5'0" FROM OPENING SILL LEVEL – FOR OPENINGS REQUIRING LATCHES AT ELEVATION ABOVE 5'0" A METHOD OF ACTIVATING SAME WILL BE PROVIDED.
- J. LATCHES ARE SPACED TO TRANSMIT THE SEALING LOAD EQUALLY TO THE SURROUNDING FRAME AND GRADE.
- K. GASKETS: ALL GASKETS SHALL BE PERMANENTLY MOUNTED IN A GROOVE, CAVITY SPECIFICALLY DESIGNATED FOR SET USE. THE USE OF ADHESIVES TO ATTACH GASKETS TO GATE/DOORS IS STRICTLY PROHIBITED.
- L. LOOSE GASKETS SHALL BE ALLOWED ONLY DURING INSTALLATION AND UTILIZED STRICTLY AS MEANS OF ISOLATION AND FLOOD PROOFING BETWEEN PERMANENTLY MOUNTED GATE FRAMES AND SELECTED MOUNTING SURFACE.
- M. ALL SEALS ARE OF CONTINUOUS MATERIAL AS SPECIFIED AND DETERMINED BY THE CONDITIONS. SEALS ARE SECURELY EMBEDDED IN A SEAL .
- N. LIFT POCKETS OR HANDLES WITHOUT THE PENETRATION OF PANEL SHALL BE PROVIDED WITH EACH PANEL TO PROVIDE FOR MANUAL REMOVAL AND PLACEMENT OF PANELS.
- O. STRAP ANCHOR DEVICES MAY BE FIELD WELDED TO THE FRAME IN ORDER TO ENSURE THEY ARE PROPERLY EMBEDDED IN CONCRETE.
- P. OTHER MOUNTING OPTIONS INCLUDE SURFACE GASKETS, BOLTS AND WEDGE ANCHORS.
- Q. CONVERSION FRAMES SHALL HAVE COUNTERSUNK MOUNTING HOLES FOR EXPANSION ANCHORS AND BOLTS.
- R. WHEN MULTIPLE PANELS ARE BEING USED, A REMOVABLE MULLION BETWEEN PANELS SHALL BE PROVIDED. THE BACK SUPPORT BRACING SHALL NOT BE IN THE FORM OF PERMANENT ATTACHMENT TO CONCRETE, OR DRILLING AND SETTING ANCHORS IN CONCRETE – FLOOR SURFACES.
- S. BOTTOM HINGED GATES SHALL BE DESIGNED TO WITHSTAND TRAFFIC LOAD AS EXPECTED IN THE PROTECTED LOCATION.
- T. DISSIMILAR MATERIALS SHALL BE SEPARATED FROM EACH OTHER WITH APPROVED GASKETS OR COATINGS
- U. OPTION – DRY CONTACT SWITCHES SHALL BE PROVIDED FOR THROW BOLTS AND INFLATABLE SEALS TO INDICATE ACTUATION OF THESE DEVICES. CONTACT SWITCHES ARE TO INTERFACE WITH OWNER'S MONITORING SYSTEM.**
- V. OPTION - A VIEW PORT FOR VISIBILITY SHALL BE PROVIDED. IT SHALL PROVIDE FOR GLASS/LENS REPLACEMENT, IT SHALL BE SEALED WITH GASKETS TO THE DOOR/GATE PANEL AND**

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MUST WITHSTAND THE SPECIFIED HYDROSTATIC HEAD. MOUNTING HEIGHT FOR VISIBILITY SHALL BE OF NO LESS THAN 5'0" AND NO GREATER THAN 5'6"

2.4.3 INSTALLATION

- A. CONVERSION FRAMES SHALL BE PERMANENTLY MOUNTED AND SHALL NOT BE REMOVED WHEN GATES ARE NOT IN STATE OF DEPLOYMENT. MAXIMUM OF 15 MINUTES PER OPENING SHALL BE ALLOWED FOR GATE / DOOR DEPLOYMENT.
- B. ANCHORS, BOLTS, AND CALKING IS PERMITTED ONLY FOR PLACEMENT OF PERMANENT NON-REMOVABLE FRAME SECTIONS.
- C. DURING FLOOD PROOFING DEPLOYMENT THE USE OF ANCHORS BOLTS CAULKING AND GASKETING (OTHER THAN GASKETS SECURELY AFFIXED TO GATES OR FRAMES IN A PERMANENTLY SET) IS STRICTLY PROHIBITED.

2.4.4 STORAGE

- A. WHEN NOT IN USE GATES SHALL BE STORED IN NEARBY LOCATION TO ASSURE REASONABLE AVAILABILITY FOR DEPLOYMENT (LESS THAN 15 MINUTES PER OPENING).
- B. SUITABLE STORAGE RACKS SHALL BE PROVIDED TO SAFEGUARD GATE (IF REMOVABLE) FROM DAMAGE TO ASSURE AVAILABILITY AND READINESS FOR EMERGENCY DEPLOYMENT.
- C. FOR BOTTOM HINGED GATES WHEN NOT IN USE, SHALL BE RECESSED IN FLOOR WITH EXPOSED SURFACE OF DIAMOND PLATE FOR TRAFFIC PASSAGE
- D. WHEN IN THE STORED POSITION ALL GASKETS SHALL BE PROTECTED FROM CUTS AND PUNCTURES.
- E. FOR GATES STORED IN LOCATIONS THAT WILL REQUIRE SUBSTANTIAL EFFORTS TO PLACE AND DEPLOY GATES A MOVING WHEELED STORAGE RACK IS REQUIRED.

2.4.5 DEPLOYMENT

- A. THE MAXIMUM WEIGHT OF ANY SINGLE REMOVABLE GATE PANEL SHALL BE 150 LBS.
- B. REMOVABLE PANELS AND GATE SYSTEMS WEIGHING MORE THAN 150 LBS SHALL HAVE A MECHANIZED ASSIST SYSTEM IN PLACE TO ASSURE AND FACILITATE TIMELY DEPLOYMENT OF GATES.
- C. FOR GATES STORED IN LOCATIONS THAT WILL REQUIRE SUBSTANTIAL EFFORTS TO PLACE AND DEPLOY GATES, A MOVING WHEELED STORAGE RACK IS REQUIRED.
- D. THE TOTAL AMOUNT OF TIME ALLOTTED FOR PLACING ANY SINGLE GATE OPENING (INCLUDING MULTIPLE GATE & MULLION ARRANGEMENTS) INTO SERVICE SHALL NOT BE GREATER THAN 15 MINUTES AND SHALL REQUIRE A CREW NO GRATER THAN 2 PEOPLE.
- E. BOTTOM HINGED GATES SHALL BE RAISED (SWUNG INTO POSITION) MANUALLY WITH MAXIMUM LIFT FORCE OF 50 FT/LBS PER PERSON. MULTIPLE PEOPLE MAY BE UTILIZED TO LIFT THE GATE.
- F. FOR GATES LARGER AND HEAVIER REQUIRING A LIFT FORCE GREATER THAN 50 FT/LBS PER PERSON A HYDRAULIC OR PNEUMATIC CYLINDER SYSTEM SHALL BE PROVIDED. ALTERNATIVELY, A WINCH SYSTEM MAY BE SET PERMANENTLY IN PLACE TO ASSIST IN PLACING GATE INTO OPERATION.
- G. THE USE OF ANCHORS, BOLTS, LOOSE GASKETS, AND CAULKING FOR PLACING GATES INTO OPERATION SHALL BE STRICTLY PROHIBITED

2.5 INSPECTION & TESTS

- A. ALL WELDS IN THE POTENTIAL "LEAK PATH" SHALL BE LIQUID PENETRANT INSPECTED IN ACCORDANCE WITH APPENDIX VIII OF SECTION VIII DIV. 1 OF ASME CODE.
- B. FINISHED ASSEMBLY OR ASSEMBLY SIMILAR IN DESIGN SHALL BE FACTORY LEAK TESTED IN ACCORDANCE

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WITH ASTM E283.

2.6 MANUFACTURERS

PRODUCTS OF THE TYPE INDICATED SHALL BE PROVIDED BY THE FOLLOWING MANUFACTURERS:

1. VR CONTAINMENT
176-25 UNION TURNPIKE
SUITE 175
FRESH MEADOWS NY 11366
TEL (516) 673 4961 FAX (866) 286 5616
E-MAIL: VR_CONTAINMENT@YMAIL.COM / WEB SITE WWW.VRCONTAINMENT.COM
2. OR PRE APPROVED EQUAL.

3.1 FIELD INSTALLATION & ERECTION

- A. INSTALLER / CONTRACTOR SHALL COMPLY WITH GATE & BARRIER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR INSTALLATION, AS APPLICABLE TO PROJECT CONDITIONS AND SUPPORTING SUBSTRATES.
- B. A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT TO SUPERVISE,
 - a. INSPECT AND ASSIST IN THE INSTALLATION AT THE START UP STAGE AND
 - b. "ON AN AS NEEDED BASIS" THEREAFTER AS DETERMINED BY THE ENGINEER.
- C. INSTALLATION TOLERANCES: GATES / DOORS SHALL BE PLUMB, LEVEL, AND ALIGNED WITHIN AN INSTALLED TOLERANCE OF 1/4-INCH IN 20 FEET AND WITHIN 1/8-INCH ONSET OF ADJOINING FACES AND OF ALIGNMENT OF MATCHING PROFILES.
- D. EXCESS SCRAP SHALL BE REMOVED AND WORKING SURFACES SHALL BE KEPT FROM DEBRIS ON A REGULAR DAILY BASIS.
- E. FILINGS CAUSED BY DRILLING OR CUTTING SHALL BE REMOVED IMMEDIATELY FROM FINISHED SURFACES.
- F. AT THE COMPLETION OF THE INSTALLATION, A CHALK TEST IS TO BE PERFORMED TO DETERMINE THE ACTUAL CONDITIONS OF THE SPECIAL DOORS.

END OF SECTION