



TECHNICAL DATA

GRATE NOZZLES MODEL GN201 360°, 180°, AND 90°

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

1. GENERAL DESCRIPTION

The Grate Nozzles are designed to protect aircraft hangars and helipads. They are available with a 360°, 180°, or 90° discharge pattern and 26", 20" and 555 mm widths to meet design requirements. The Grate Nozzles are AFFF foam discharge devices that deliver a uniform discharge pattern with a maximum spacing of 50' x 25' (15.2 m x 7.6 m). The nozzles are installed flush with the floor of the protection area within the trench drain. The companion trench drain grate is specially engineered to receive the Grate Nozzle® and serve as a cover for the drain trench.



2. LISTINGS AND APPROVALS

The Grate Nozzle is FM Approved/ UL Listed as part of a fire suppression system combining designated foam concentrates, proportioning devices and bladder tanks. Approved and Listed system components can be found at www.approvalguide.com and www.database.UL.com



FM Approved – Low Expansion Foam Systems (FM5130)



UL Listed: Guide GFUT.EX5194

UL Listed with the following Foam Concentrates:

- Viking AFFF 3%M C6
- Viking AFFF 3%S C6
- Viking AFFF 1%S C6
- Fomtec AFFF 3%M
- Fomtec AFFF 3%S
- Fomtec AFFF 1% Ultra LT

US DOD Acceptance

U.S. Patent numbers: 6,182,767 6,371,212 Additional patent pending

3. TECHNICAL DATA

3.1 Construction Features

Grate Nozzle

- The Grate Nozzle spreads AFFF foam solution over the burning liquid faster than conventional overhead deluge foam systems or oscillating monitors because they are located at the floor where spills typically happen.
- 2" grooved inlet for simple installation and removal.
- Durable construction designed for maximum direct load of 350 PSI over surface area of assembly, (designed to withstand load of airplane parked over Grate Nozzle).
- The Grate Nozzle has no moving parts. The spray pattern is developed from its installed position.
- Grate Nozzles are located in trench drains so valuable floor space is left for aircraft storage and servicing. The Grate Nozzle discharges foam solution at the floor level in the same location that a fuel spill will occur. The location of Grate Nozzles eliminates the need for expensive underwing oscillating monitors.
- The Grate Nozzle has been tested for obstruction to discharge such as aircraft tires, 55 gallon barrels, 3/4" rubber hoses, construction materials, with little effect on time of floor coverage. Grate Nozzles have been covered during discharge, (such as would happen if an airplane tire were parked over it), only to have Grate Nozzles located in the same supply piping increase their flow rate and make up the discharge area lost by the covered Grate Nozzle.
- The Grate Nozzle system can also be used for floor wash-down as well. Operating the floor nozzle system without foam solution is a superb method of operating fire protection systems as per NFPA 25 requires, as well as determining if Grate Nozzles require cleaning.
- Maximum height of spray pattern above floor is 18".

Trench drain grate

- The trench drain grate is designed as a receiver for the Grate Nozzle.
- The trench drain grate is placed in line with other lengths of trench drain grates to provide a uniform floor and trench drain level.
- The trench drain grate are designed to blend with existing and new trench drain installation.
- Grate drain slots in the trench drain grate are of uniform size with standard grating to enable drainage to occur at the special grate placement.



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3.2 Standard Materials

Table 3.2.1 - Standard Materials

Grate Nozzle:	UNS S31600 Stainless Steel
Grate:	Ductile Iron, ASTM A536 Grade 80-55-06
"X" Frame Supports:	Ductile Iron, ASTM A536 Grade 80-55-06
Paint:	Epoxy powder coating
Standard color:	Red

3.3 Standard Design Specifications

Table 3.3.1 - Standard Design Specifications

Model	Type	K-factor		Working Pressure ¹				Flow Range				Approvals ²
				Minimum		Maximum		Minimum		Maximum		
		Imperial	Metric	PSI	bar	PSI	bar	GPM	LPM	GPM	LPM	
GN201	360	23.3	333	40	2.76	70	4.82	147	556	195	737	FM/UL
	180	11.9	170	40	2.76	70	4.82	75	284	100	378	FM/UL
	90	6.4	91	40	2.76	70	4.82	40	151	54	204	FM/UL

Footnotes

- Working pressure at inlet of the Grate Nozzle.
- Please refer to www.database.UL.com for specific Listing data. Note that the listed Working Pressure and Flow Ranges are specific to the tested foam concentrate.

3.4 Ordering Information

Table 3.4.1 - Ordering Information

Part Number ¹	Discharge Pattern	Size		Shipping Weight	
		Inches	Millimeters	Lbs	Kg
F21949	360°	26	--	130	59
F21996	360°	20	--	105	48
F22018	360°	--	555	110	50
F21948	180°	26	--	130	59
F21995	180°	20	--	105	48
F22017	180°	--	555	110	50
F21947	90°	26	--	130	59
F21994	90°	20	--	105	48
F22016	90°	--	555	110	50



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4. SCOPE OF DELIVERY

Ensure that all components are complete and in good condition. The Grate Nozzle is supplied individually boxed with the items listed below.

Included:

- Grate Nozzle (Quantity 1)
- Grate (Quantity 1)
- "X" Frame Support (Quantity 2)

Not included:

- Grooved coupling

5. AVAILABILITY

Please contact your local Viking sales office for further information.

The product is available directly from Viking and official distributors only.

EMEA: Viking SA, ZI Haneboesch, L-4562 Differdange / Niederkorn, Tel.: +352 58 37 37 - 1, Fax: +352 38 37 36, vikinglux@viking-emea.com

Americas: The Viking Corporation, 210 N. Industrial Park Drive, Hastings, Michigan 49058, Toll free phone: (800) 968-9501

APAC: The Viking Corporation (Far East) Pte. Ltd., 69 Tuas View Square, Westlink Techpark, Singapore 637621

Tel: (+65) 6 278 4061, Fax: (+65) 6 278 4609, Email: vikingsingapore@vikingcorp.com

6. PRODUCT VARIANTS

6.1 Options

- Available with 26", 20", or 555 mm grate.
- Available with 360, 180, or 90 degree nozzle assembly.

6.2 Dimensions: Nozzle Assembly

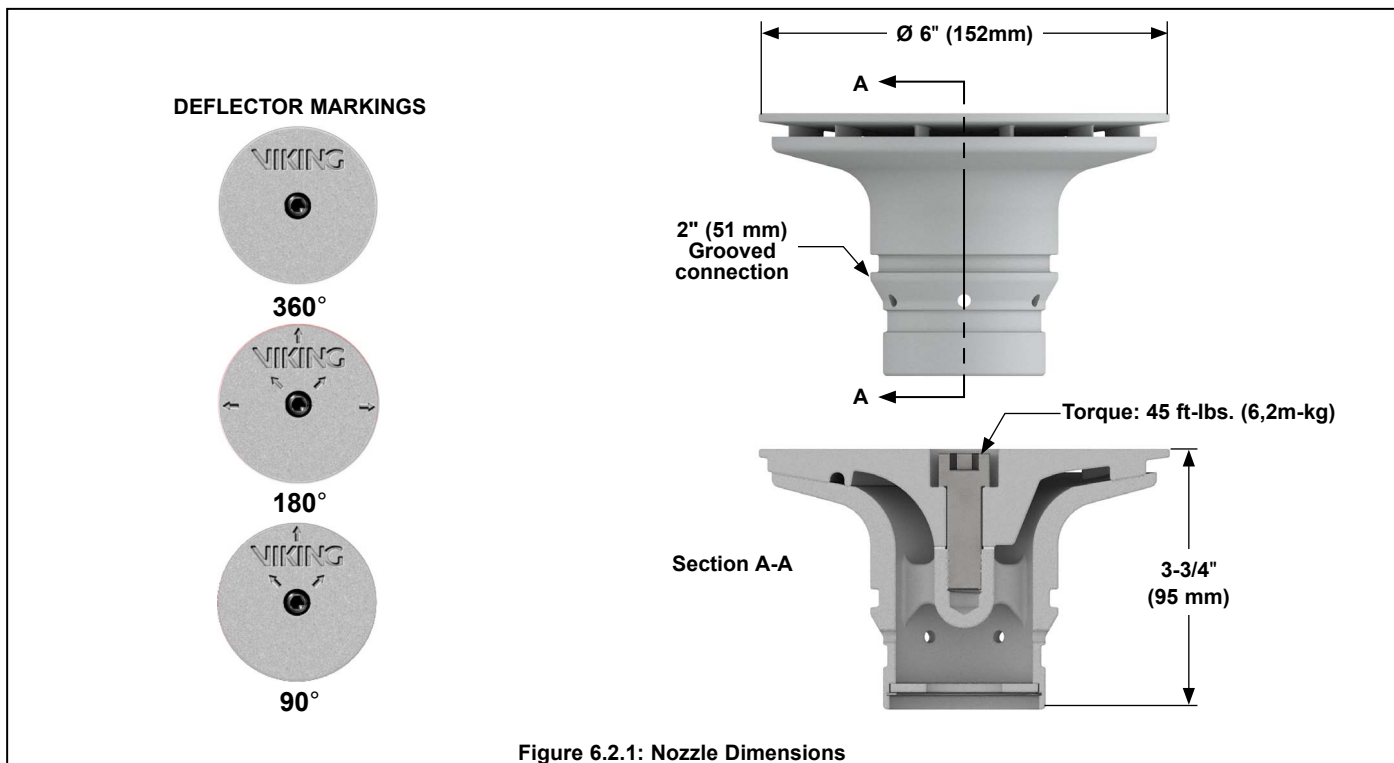


Figure 6.2.1: Nozzle Dimensions

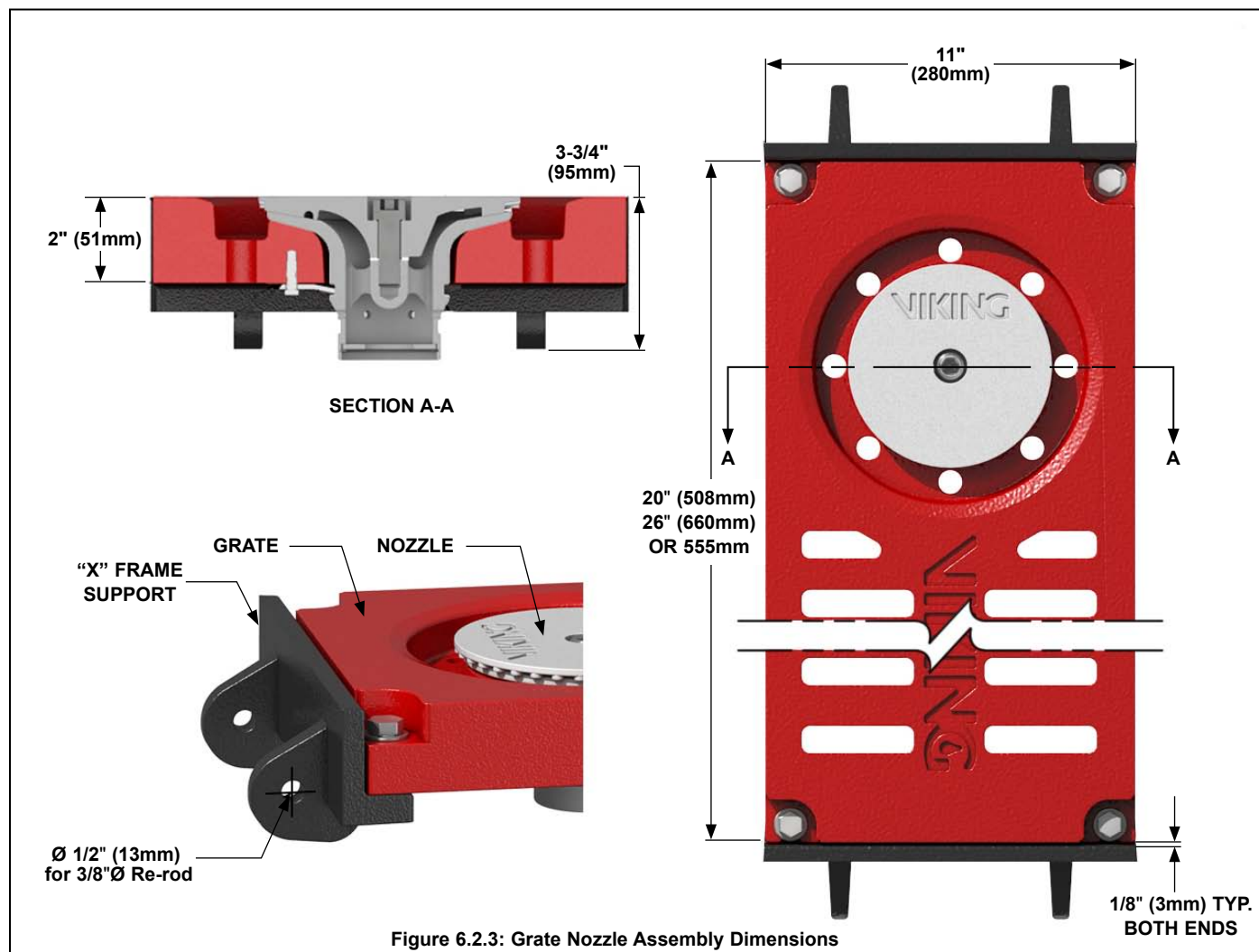


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6.3 Dimensions: Grate Assembly





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7. PERFORMANCE DATA

7.1 Spacing of Grate Nozzles

Refer to Figures 7.1.1 through 7.1.4 for examples of Grate Nozzle spacing. Standard practice is to locate the Grate Nozzles so that the maximum distance between nozzles in a trench is 25' and that trench drains are not located in excess of 50' on center, (20' maximum from walls). Configurations other than this may be acceptable, contact Viking for designs other than what is indicated.

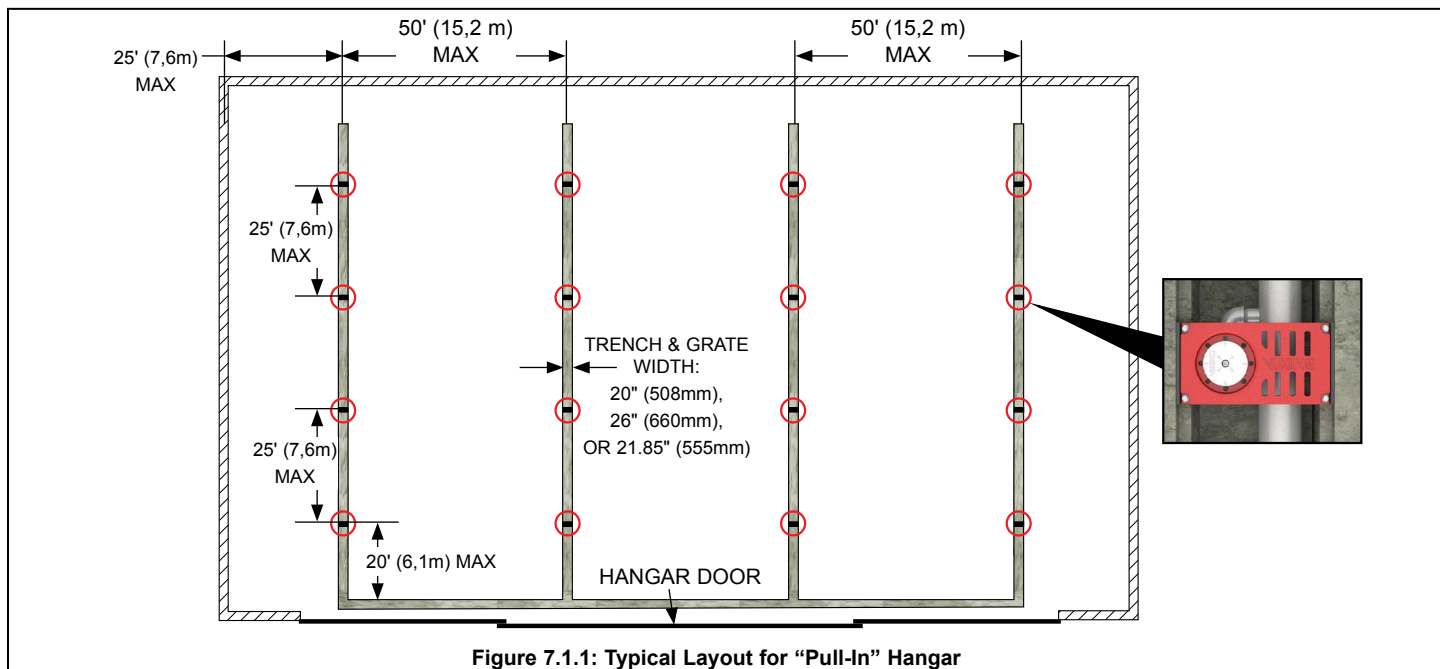


Figure 7.1.1: Typical Layout for "Pull-In" Hangar

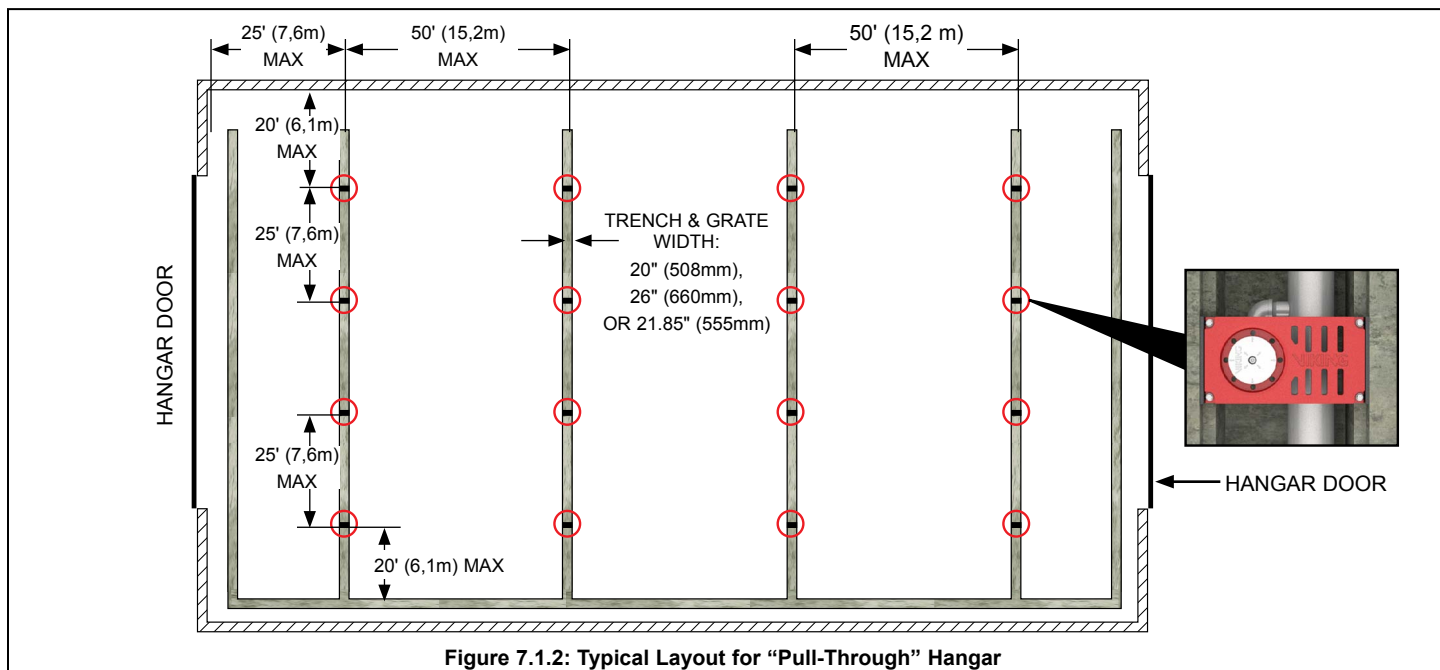


Figure 7.1.2: Typical Layout for "Pull-Through" Hangar



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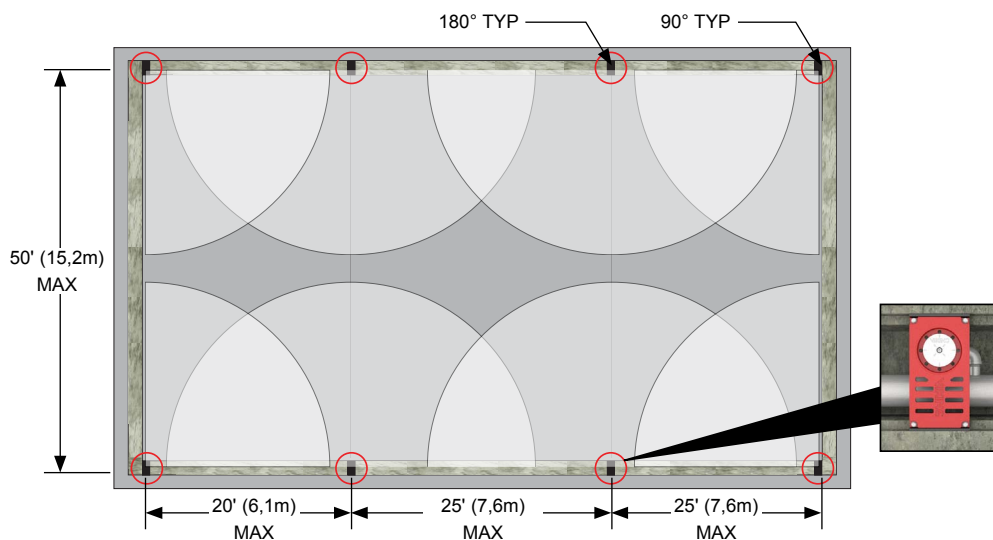


Figure 7.1.3: Typical Nozzle and Trench Heliport using 90° Nozzles in Corners and 180° Nozzles in Centers

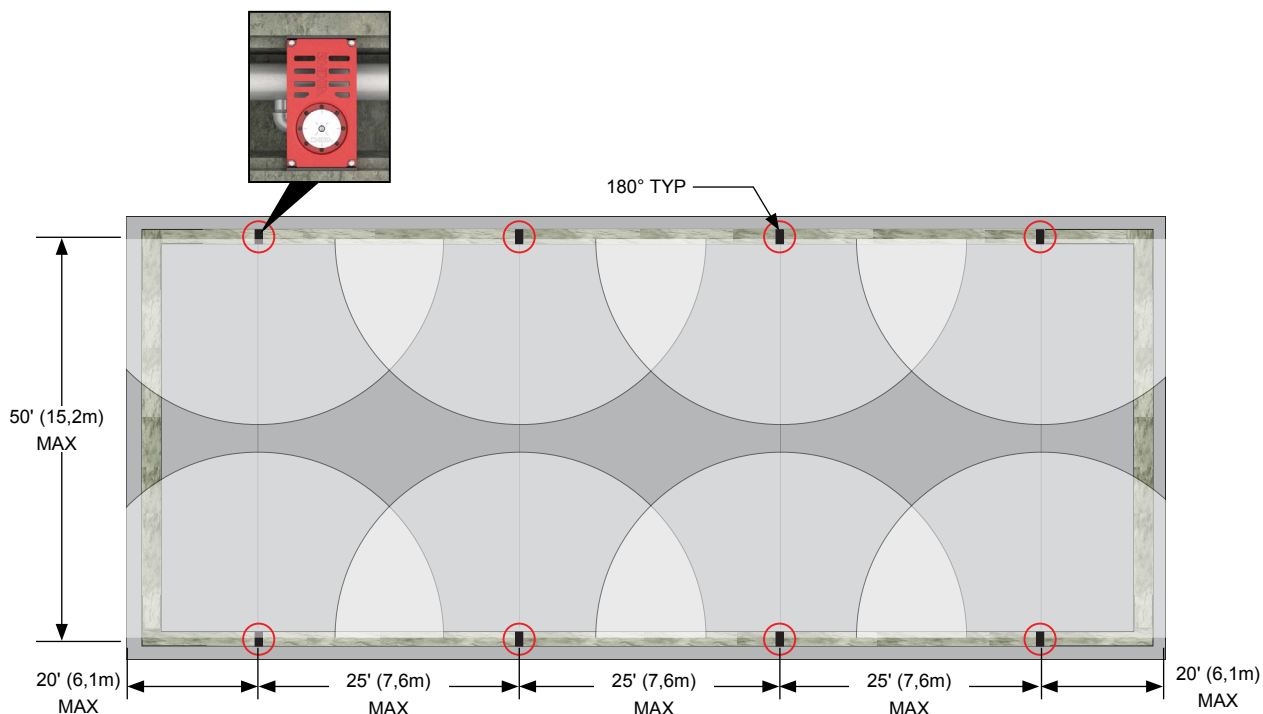


Figure 7.1.4: Typical Nozzle and Trench Heliport using 180° Nozzles



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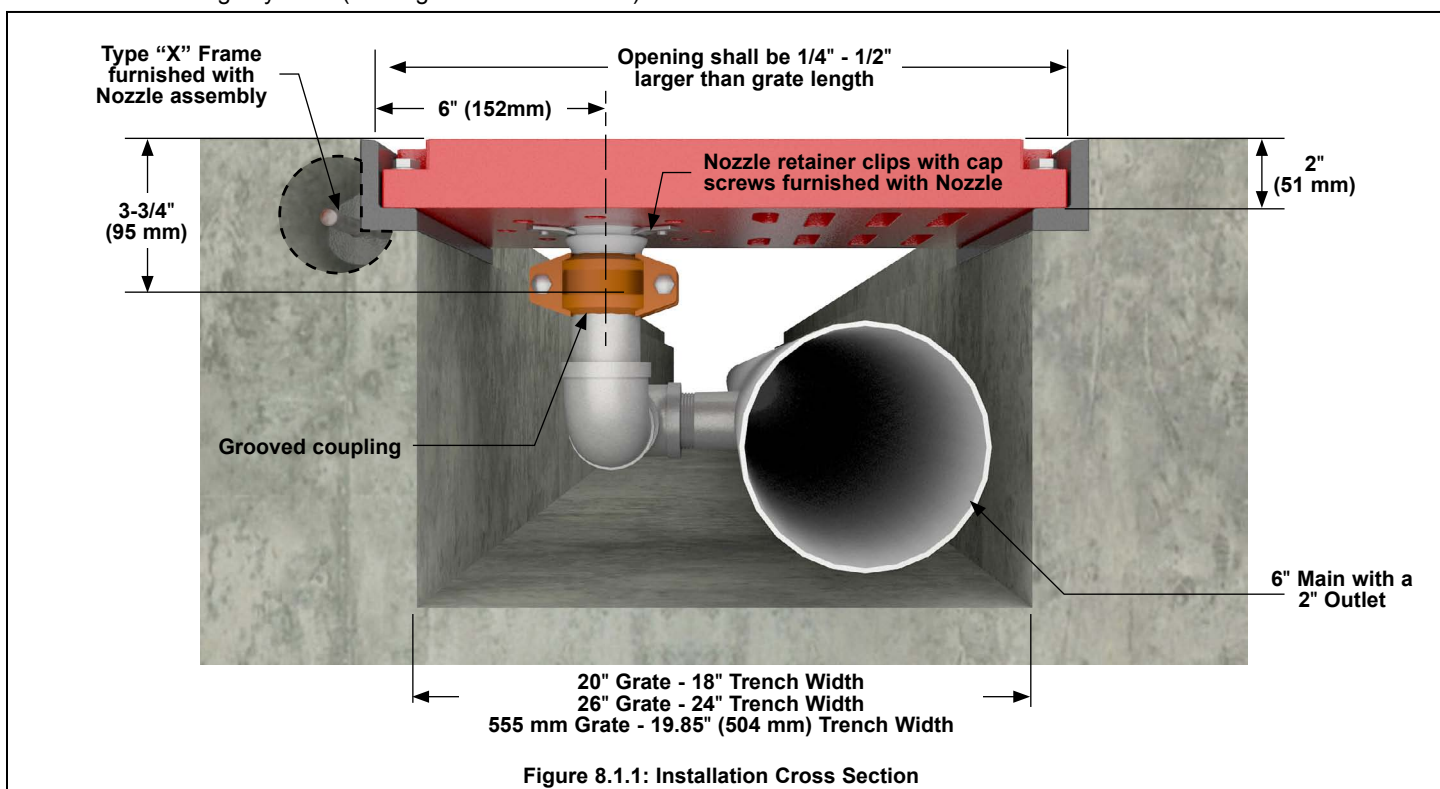
8. INSTALLATION

8.1 General Notes

NOTICE

Minimum concrete grade shall be 4500 PSI compression load. This is to withstand the maximum design load of the grate assembly. To prevent over discharge of foam solution, care should be taken to achieve the pressure range defined in Table 3.3.1 at the inlet to the Grate Nozzle. It is therefore recommended to use a Pressure Regulating Flow Control Valve on larger systems.

- A. The water or foam/water solution supply to Grate Nozzles must be continuous, clean, and obstruction free. It is recommended that all nozzle deflectors are removed and the pipework flushed prior to commissioning.
- B. Ensure that the deflector is orientated in the correct direction on the 180° and 90° types.
- C. When removing and replacing the nozzle deflector, the deflector retaining bolt must be tightened to a minimum torque of 45 ft-lbs
- D. The Viking Grate Nozzle can only be installed with the accompanying Viking Drain Trench Grate to form the Grate Nozzle Assembly. This combination has been designed and tested together for assured performance.
- E. Installation of the Grate Nozzle assembly and standard drain trench grates require that adequate drain trench sizing has been accounted for. (see Figure 8.1.1) Trench drain size should be defined by the architect or project engineer at an early stage and prior to installation.
- F. The Grate Nozzle is provided with a 2" grooved inlet for ease of installation and removal.
- G. Supply piping must be located in the trench. A 2" supply pipe should be piped horizontally from the supply main located in the trench, and then vertically to the Grate Nozzle. The 2" supply must terminate in a grooved connection to allow for installation to the Grate Nozzle. (see Figure 8.1.1)
- H. The supply piping must be self-supporting.
- I. Install wye-type strainers with isolation valves upstream of the riser. Strainers are to be Stainless Steel with a mesh screen no greater than 1/8" perforation.
- J. Grate Nozzles should be installed so that a particular building feature such as a column or raised floor does not cause an obstruction to discharge to the Grate Nozzle.
- K. The "X" frame furnished with the Grate Nozzle assembly shall be set in concrete using re-rod as shown in Figure 8.1.2.
- L. Positioning must be flush with floor, aligned for bolting of grate to frame and placed to accommodate the remaining grate drainage system. (see Figure 8.1.2 and 8.3.1)





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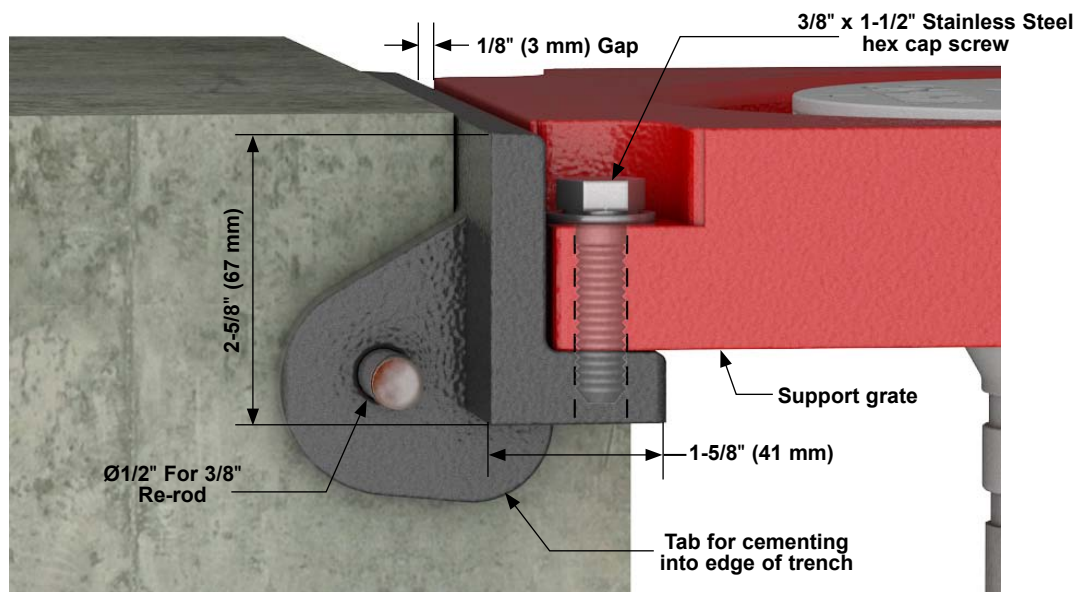
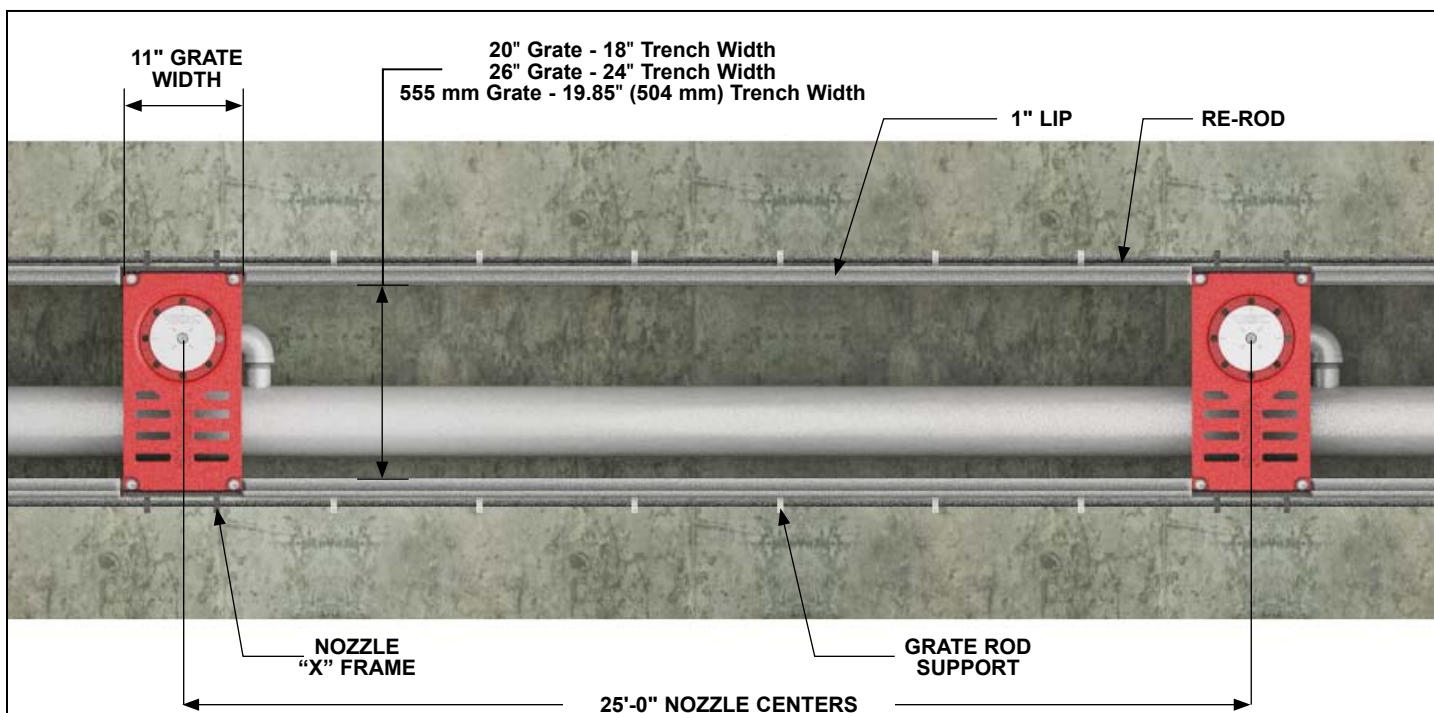


Figure 8.1.2: "X"-Frame Installation Dimensions



Typical layout trench nozzle location with 20" wide grates 18" trench width and 1" wide lip on both sides. 25'-0" space is nominal to allow clearance of standard grating for trench.
 Use an "X" frame and re-rod system that matches typical drainage grate system approved for aircraft hangar use.
 Maintain a 2" depth.

Figure 8.1.3: Typical Layout Trench Nozzle Locations



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9. OPERATION

The Grate Nozzle is a deluge discharge device located at the floor level of an aircraft hangar. Grate Nozzles provide floor coverage by discharging foam solution at the floor level in a fixed 90°, 180°, or 360° pattern. The discharge pattern has a 25' radius for all models. Grate Nozzles are installed into a trench drain grate. Grate Nozzles are supplied from a pressure regulating deluge or flow control system. Refer to appropriate Viking technical data pages.

10. GUARANTEES

For details of warranty, refer to Viking's current list price schedule or contact The Viking Corporation directly.

11. INSPECTIONS, TESTS AND MAINTENANCE

WARNING

Any system maintenance or testing that involves placing a control valve or detection system out of service may eliminate the fire protection of that system. Prior to proceeding, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

Refer to respective requirements, according to the relevant standards for Inspection, Testing and Maintenance. If applicable, refer to FM Global Property Loss Prevention Datasheet 4-12 for specific test and commissioning criteria.

In addition, the "Authority Having Jurisdiction" (AHJ) may have additional maintenance, testing and inspection requirements that must be followed. Grate Nozzles are open discharge devices and require inspection, per NFPA 25, be conducted at least annually. As the nozzles are part of a deluge system, system testing and maintenance shall be that of NFPA 25 and the manufacturer's recommendations.

If Grate Nozzles are installed in an area subject to freezing, frequent inspections may be required to ensure particles of ice have not formed in front of the discharge ports of the Grate Nozzle.

12. DISPOSAL



At end of use the product described here should be disposed of via the national recycling system.



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13. ACCESSORIES AND SPARE PARTS

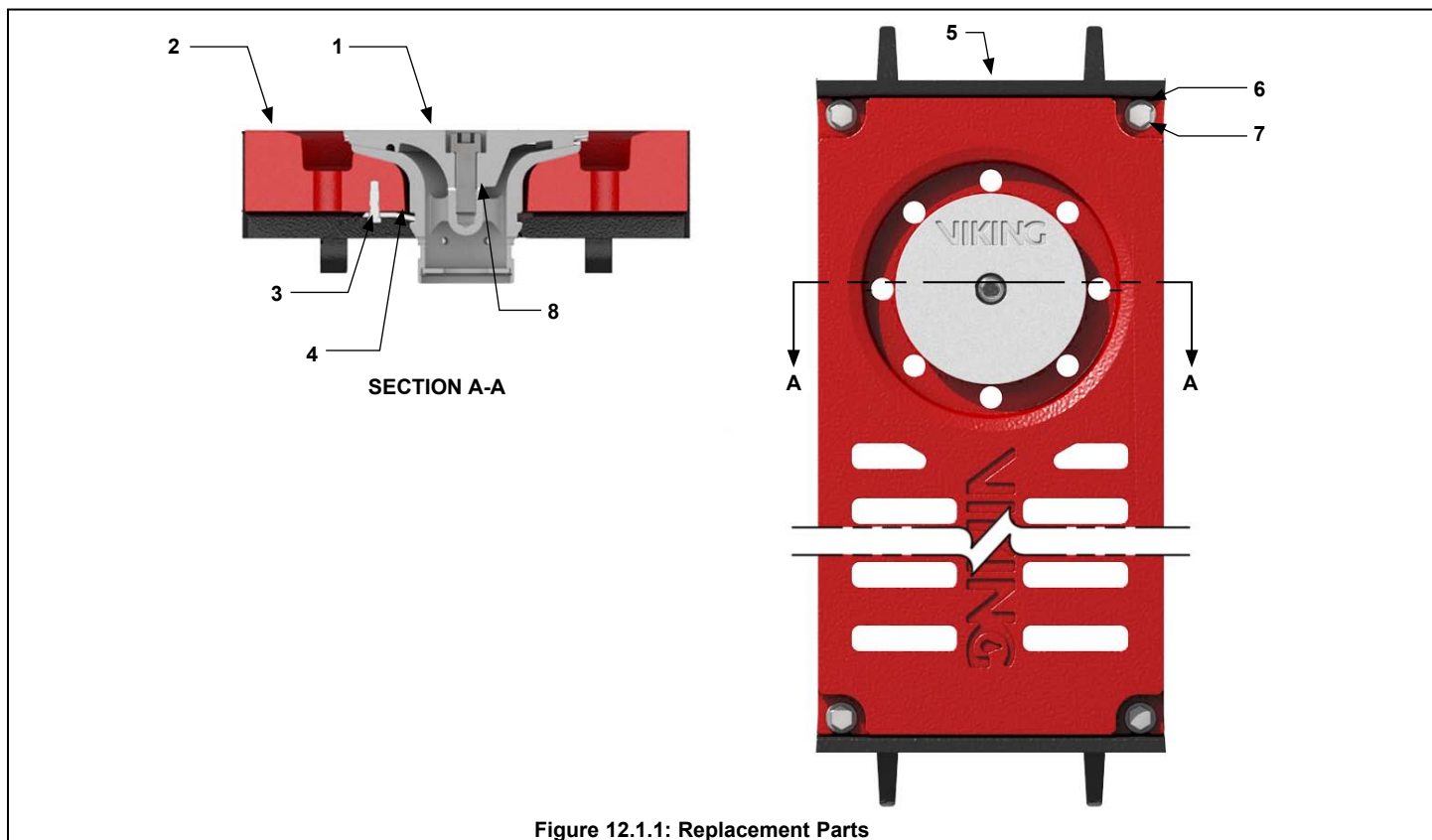


Figure 12.1.1: Replacement Parts

Ref.	PART NUMBER			DESCRIPTION	MATERIAL	No. req'd
	20" Grate	26" Grate	555mm Grate			
1		F21942		Nozzle Assembly - 360°	316 Stainless Steel	1
		F21941		Nozzle Assembly - 180°		
		F21940		Nozzle Assembly - 90°		
2	F02020/Q08	F02003/Q08	F21998/Q08	Grate	80-55-06 Ductile Iron	1
3		01761A		Screw, H.H.C., 1/4-20 x 1/2" Lg.	18-8 Stainless Steel	3
4		F02008		Spring Clip	316 Stainless Steel	3
5		17525*		"X" Frame Support Package	Class 35B Cast Iron	1
6		10949		Screw, H.H.C., 3/8-16 x 1-1/2 Lg.	18-8 Stainless Steel	4
7		10951		3/8 Flat Washer	316 Stainless Steel	4
8		F02007		PTFE Washer	PTFE	1

* Part Number 17525 is a package that includes 2 "X" Frame supports and necessary hardware.