



## TECHNICAL DATA

### MODEL GN202 GRATE NOZZLES® 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](mailto:techsvcs@vikingcorp.com)

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## 1. GENERAL DESCRIPTION

The Model GN202 Grate Nozzles® are designed to protect aircraft hangars and helidecks. They are available with a 360°, 180°, or 90° discharge pattern at various widths and shapes to meet design requirements. The nozzles are low-expansion 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. The drain grates are specially engineered to receive the nozzle and serve as a cover for the drain opening.

## 2. LISTINGS AND APPROVALS

The Model GN202 Grate Nozzles are FM Approved for use in aircraft hangars and helideck applications as part of a fire suppression system combining designated foam concentrates, proportioning devices, bladder tanks, atmospheric tanks and foam pumps. Approved system components can be found at [www.approvalguide.com](http://www.approvalguide.com).



**FM Approved** – Low-Expansion Foam Systems (FM5130)

Approved with the following foam concentrates:

- Fomtec Enviro USP, 3%

**US DOD Accepted**

“**SFFF compatible**” refers to this product as being part of a SFFF Foam system that has been tested to recognized standards. Not all configurations are available. Please consult technical data and/or the Approval for usage requirements.

## 3. TECHNICAL DATA

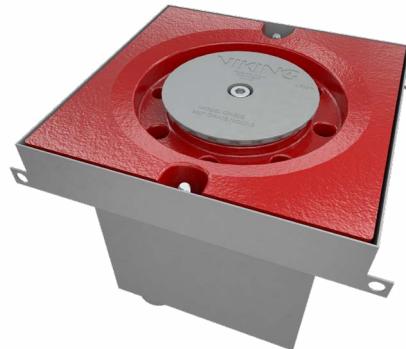
### 3.1 Materials of Construction

Table 3.1.1 - 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



Grate Nozzle  
(including X-Frame, for use in trenches)



Grate Nozzle (for use on helideck center)



Grate Nozzle (for use on helideck perimeter)





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### 3.2 Standard Design Specifications

**Table 3.2.1 - Standard Design Specifications**

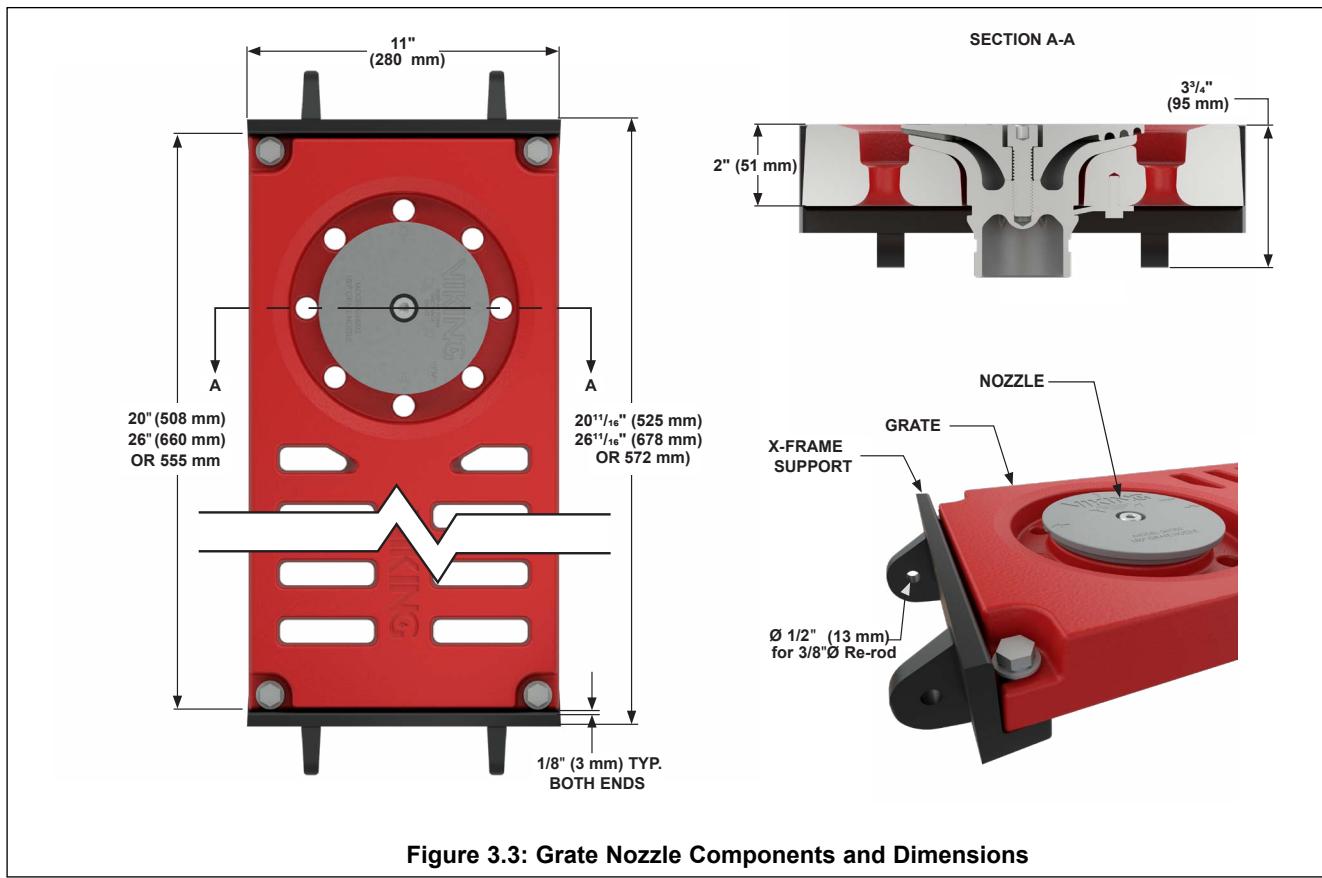
Model	Type	K-factor		Working Pressure <sup>1</sup>				Flow Range				Approvals <sup>2</sup>
				Minimum		Maximum		Minimum		Maximum		
		Imperial	Metric	PSI	bar	PSI	bar	GPM	LPM	GPM	LPM	
GN202	360°	23.2	331	40	2.76	70	4.82	147	555	194	735	FM
	180°	12.5	179	40	2.76	70	4.82	79	299	105	396	FM
	90°	6.8	97	40	2.76	70	4.82	43	163	57	215	FM

#### Footnotes

1. Working pressure at inlet of the Grate Nozzle.

2. The listed working pressure and flow ranges are specific to the tested foam concentrate.

### 3.3 Grate Nozzle Components and Dimensions (with trench drain grate)



**Figure 3.3: Grate Nozzle Components and Dimensions**



## TECHNICAL DATA

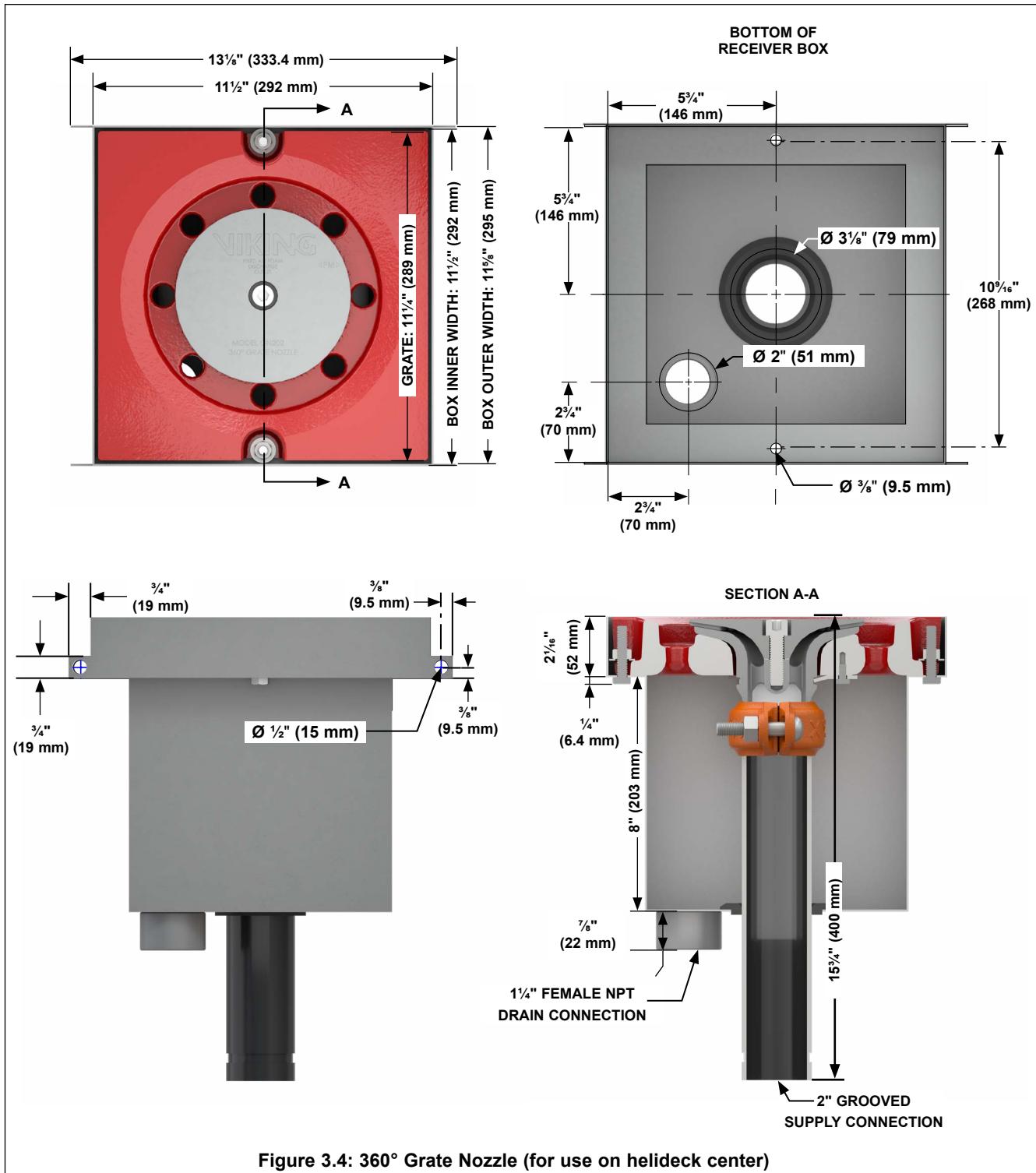
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### 3.4 360° Grate Nozzle Components and Dimensions (with receiver box for use on helideck center)



**Figure 3.4: 360° Grate Nozzle (for use on helideck center)**



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### 3.5 Grate Nozzle Dimensions and Markings (for use on helideck perimeter)

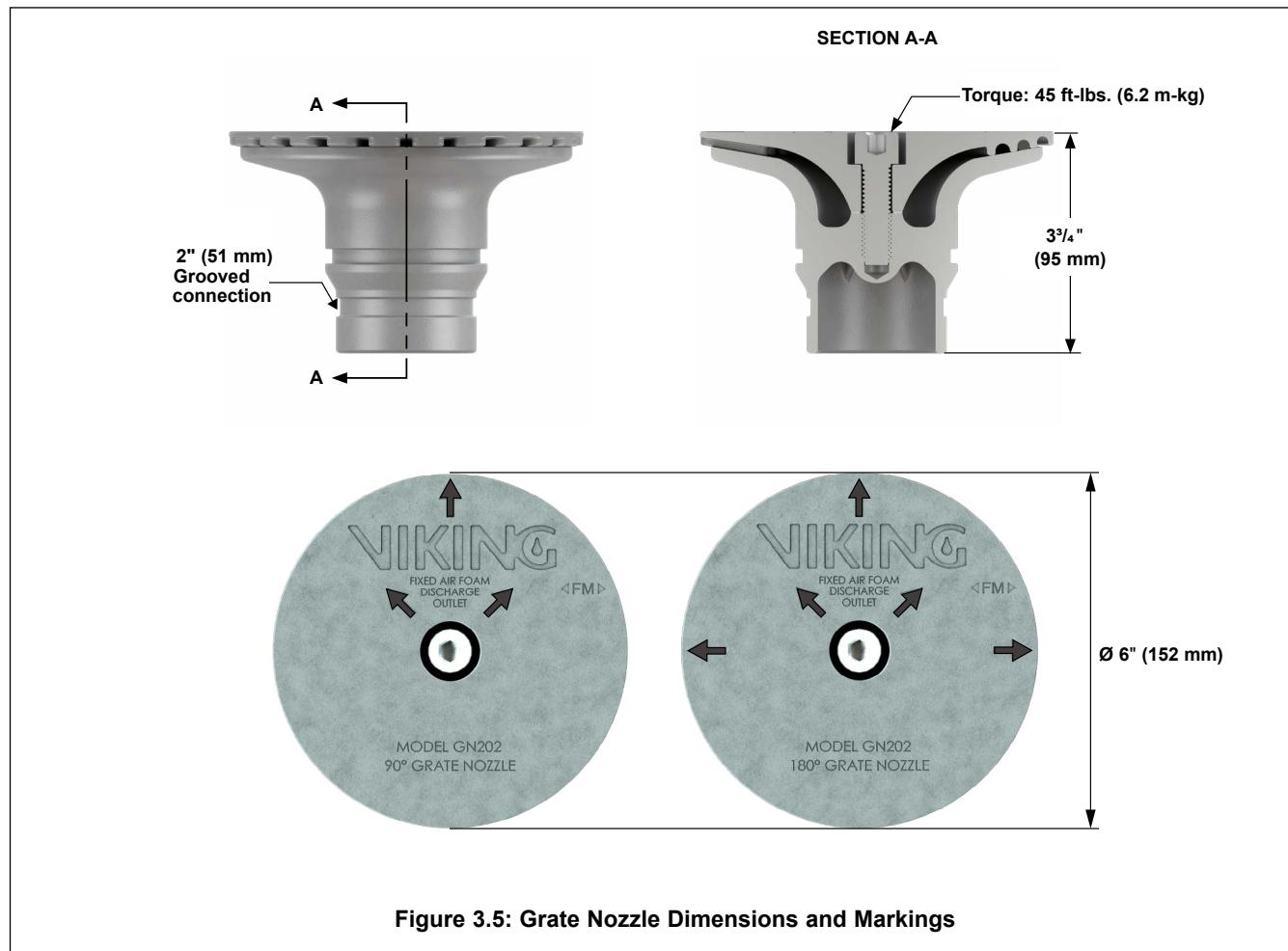


Figure 3.5: Grate Nozzle Dimensions and Markings



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### 3.6 X-Frame Support Dimensions

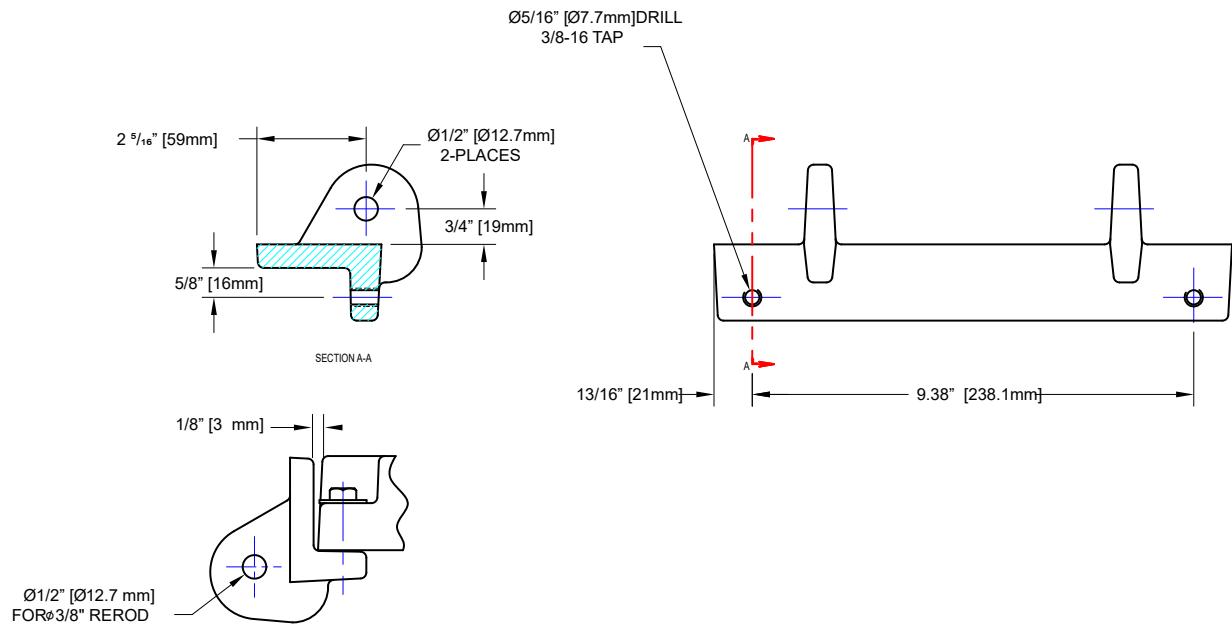


Figure 3.6: X-Frame Support Dimensions



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### 3.7 Ordering information

The Model GN202 Grate Nozzles can be ordered using the information in the table below. The X-Frame kit allows for installation of the support frame for the Grate Nozzles.

**Table 3.6.1 - Ordering Information**

	Description	Discharge Pattern	Part Number	Grate Size		Approximate Shipping Weight	
				Inches	Millimeters	Lbs	Kg
Grate Nozzles and Accessories (for use in trenches)	Grate Nozzle (for use in trenches) Figure 4.1.1	360°	F24812	26	--	130	59
			F24811	20	--	105	48
			F24833	--	555	110	50
		180°	F24809	26	--	130	59
			F24808	20	--	105	48
			F24832	--	555	110	50
	Grate Nozzle (excluding X-Frame supports) Figure 4.2.1	90°	F24806	26	--	130	59
			F24805	20	--	105	48
			F24831	--	555	110	50
		360°	F24830	26	--	115	52
			F24829	20	--	90	41
			F24836	--	555	95	43
Grate Nozzles (for use on Helidecks)	Grate Nozzle (for use on helideck center) Figure 4.4.1	180°	F24827	26	--	115	52
			F24826	20	--	90	41
			F24835	--	555	95	43
		90°	F24824	26	--	115	52
			F24823	20	--	90	41
			F24834	--	555	95	43
	X-Frame Support Kit Figure 4.3.1	Not applicable	17525	--	--	15	7
	360° Grate Nozzle (for use on helideck center) Figure 4.4.1	360°	F25613	11 $\frac{1}{4}$	289	78	35.4
	180° Grate Nozzle (for use on helideck perimeter) Figure 4.5.1	180°	F24802	Not applicable		6 $\frac{1}{4}$	3
	90° Grate nozzle (for use on helideck perimeter) Figure 4.5.1	90°	F24801	Not applicable		6 $\frac{1}{4}$	3



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### 4. SCOPE OF DELIVERY

#### 4.1 Grate Nozzle Assembly (for use in trenches)

The Grate Nozzle Assembly includes a Grate Nozzle (available with various grate widths) and 2 X-Frame supports with mounting hardware.

**NOTE: Grooved couplings are not included but required for installation.**



**Figure 4.1.1  
Grate Nozzle Assembly (for use in trenches)**

#### 4.2 Grate Nozzles

The Grate Nozzle includes a nozzle assembly and a trench grate (available with various widths). The X-Frame supports are not included and must be ordered separately.

**NOTE: Grooved couplings are not included but required for installation.**



**Figure 4.2.1  
Grate Nozzle (without X-frame)**



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The X-Frame kit includes two X-Frame supports (the required quantity for 1 Grate Nozzle). The Grate Nozzle must be ordered separately. The X-Frame Kit components are shipped loose.

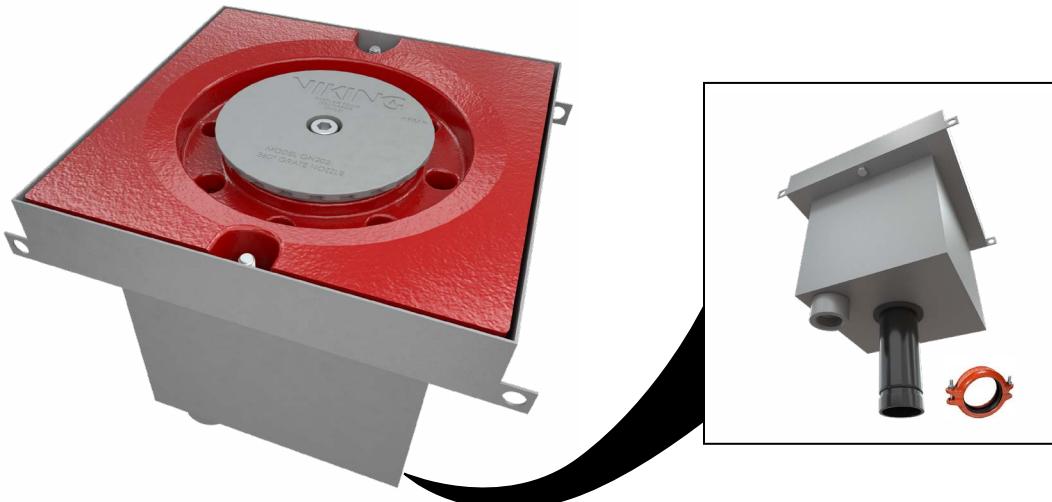


**Figure 4.3.1**  
**X-Frame Kit**

**4.4 Grate Nozzle Assembly (for use on helidecks-center)**

The Grate Nozzle assembly shown below includes 1 receiver box, a 360° nozzle, a 2" grooved adapter coupling, and 2" schedule 40 grooved adapter pipe with seal ring. The item shown below is shipped fully assembled.

**NOTE: Additional grooved couplings are not included but are required for installation.**



**Figure 4.4.1**  
**Grate Nozzle Assembly (for use on helideck center)**



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#### 4.5 Grate Nozzle Assembly (for use helideck perimeter)

The nozzle assemblies include a nozzle with 90° or 180° deflector. The nozzles are shipped fully assembled.

**NOTE: Grooved couplings are not included but are required for installation.**



**Figure 4.5.1**  
**Grate Nozzle Assembly (for use on helideck perimeter)**

## 5. AVAILABILITY

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

### Americas:

The Viking Corporation  
5150 Beltway SE  
Caledonia, MI 49316  
Tel.: (800) 968-9501  
Fax: 269-818-1680  
Technical Services: 1-877-384-5464  
[techsvcs@vikingcorp.com](mailto:techsvcs@vikingcorp.com)

### EMEA:

Viking S.A.  
21, Z.I. Haneboesch  
L-4562 Differdange / Niederkorn  
Tel.: +352 58 37 37 – 1  
Fax: +352 58 37 36  
[vikinglux@viking-emea.com](mailto:vikinglux@viking-emea.com)

### Asia Pacific (APAC) Main Office:

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  
[vikingAPAC@vikingcorp.com](mailto:vikingAPAC@vikingcorp.com)



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## 6. PERFORMANCE DATA

### 6.1 Spacing of Grate Nozzles

Refer to Figures 6.1.1 through 6.1.6 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, (25' maximum from walls). Configurations other than this may be acceptable, contact Viking for designs other than what is indicated.

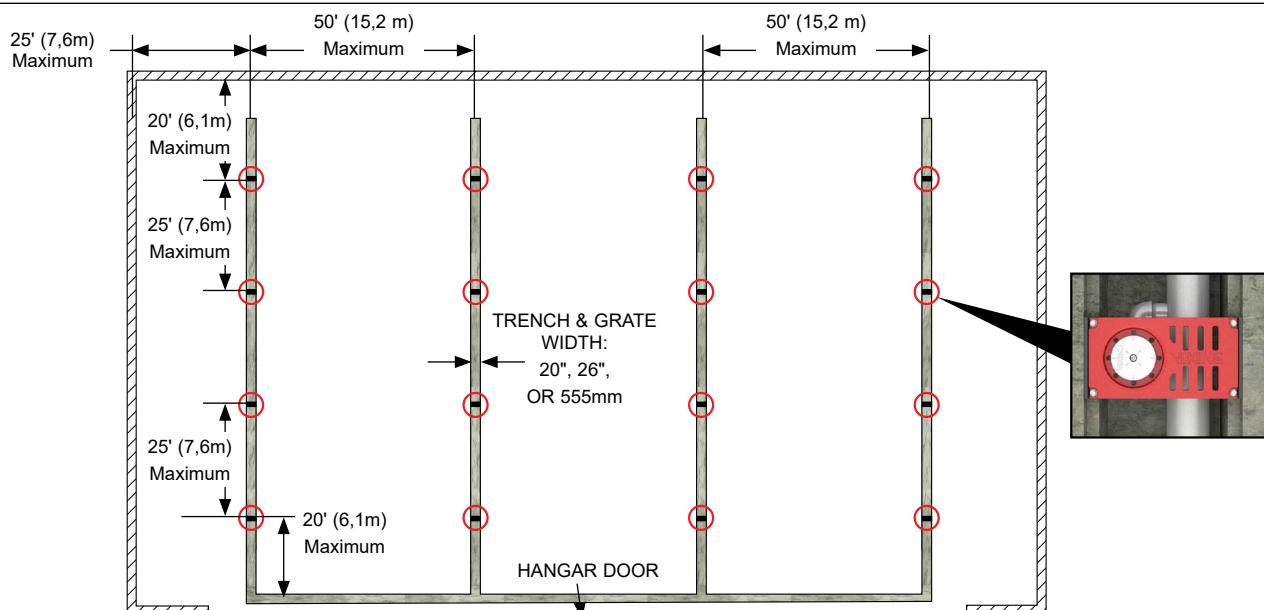


Figure 6.1.1: Typical Layout for "Pull-In" Hangar

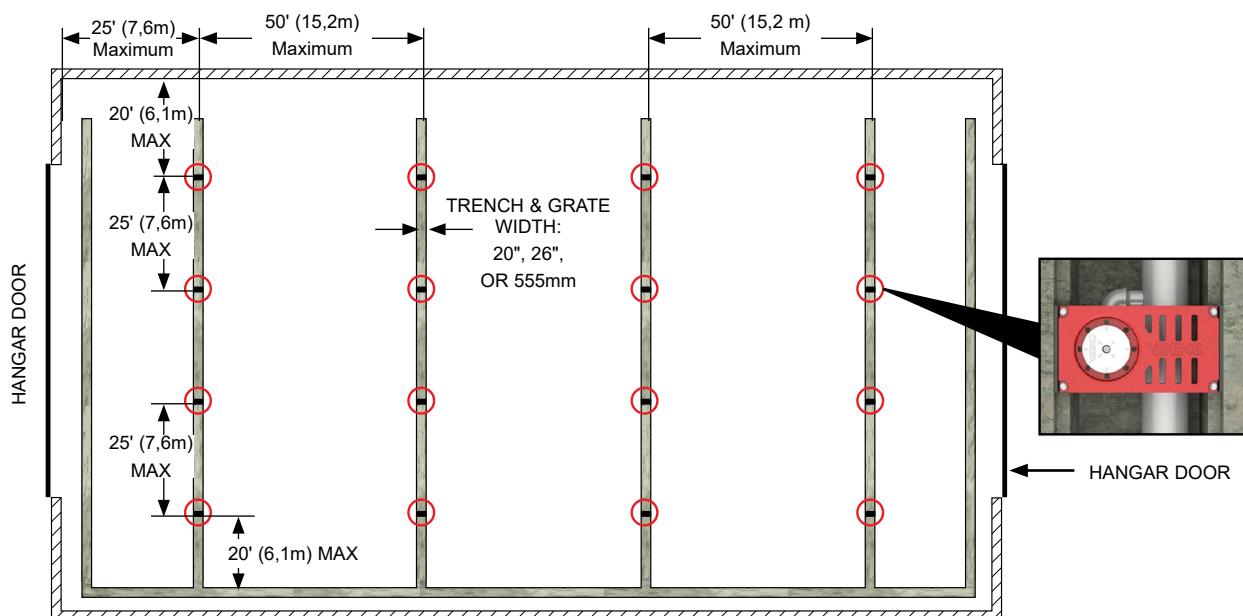


Figure 6.1.2: Typical Layout for "Pull-Through" Hangar



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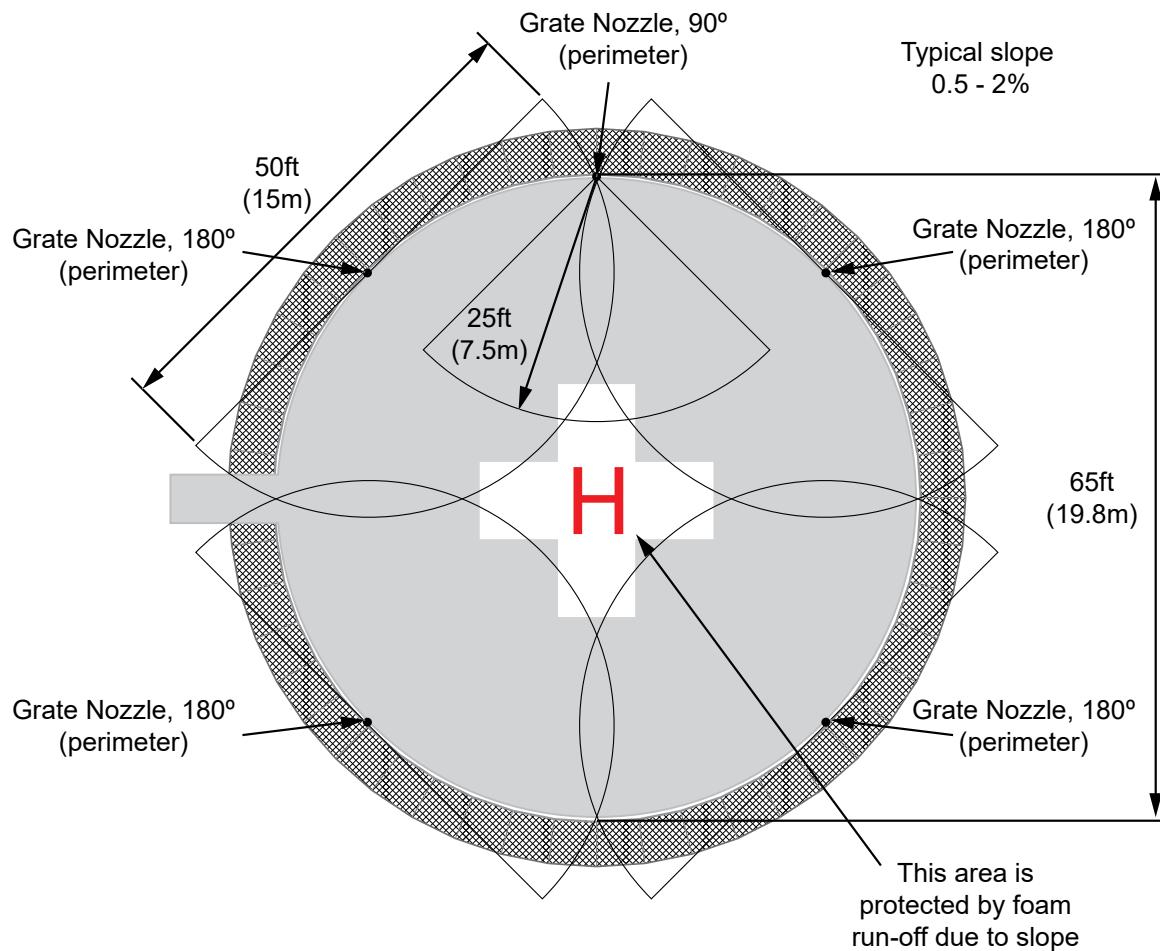


Figure 6.1.3: Typical 65' (19.8m) Round Heliport Protection



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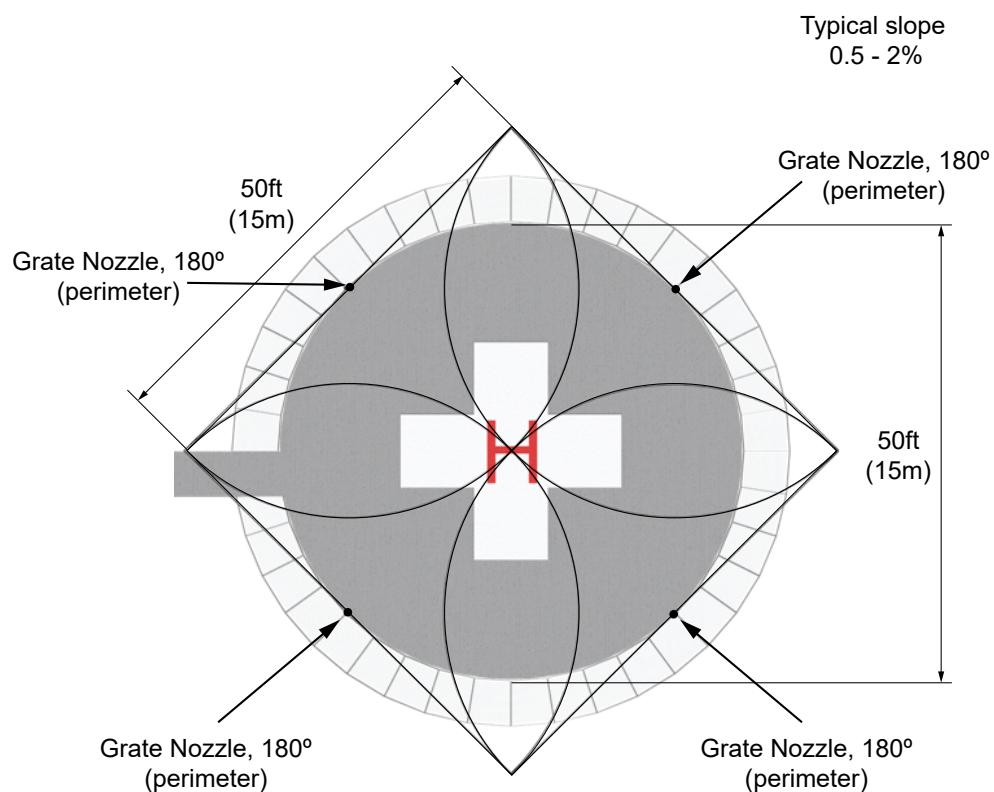
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Figure 6.1.4: Typical 50' (15m) Round Heliport Protection



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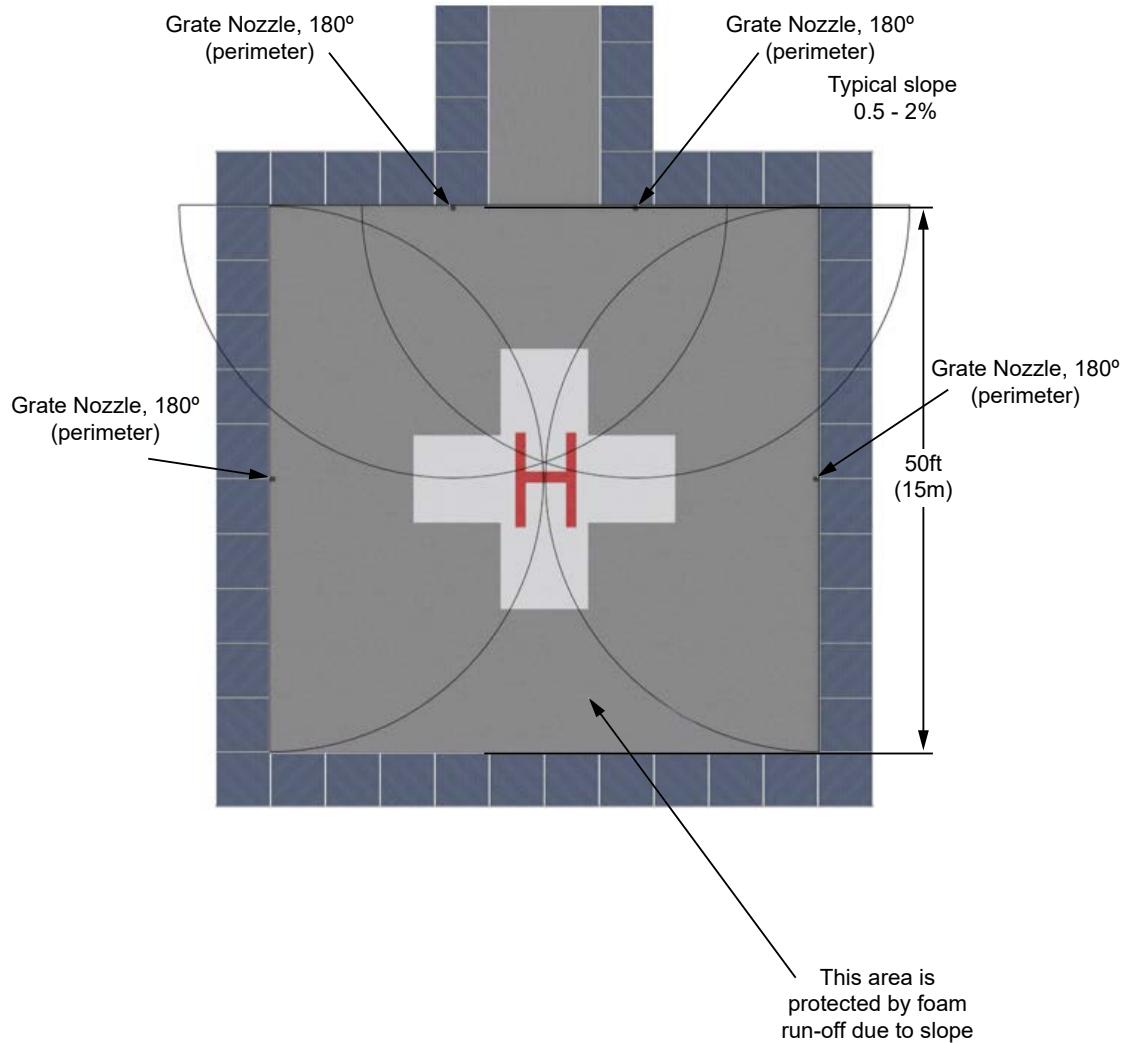


Figure 6.1.5: Typical 50' (15m) Square Heliport Protection



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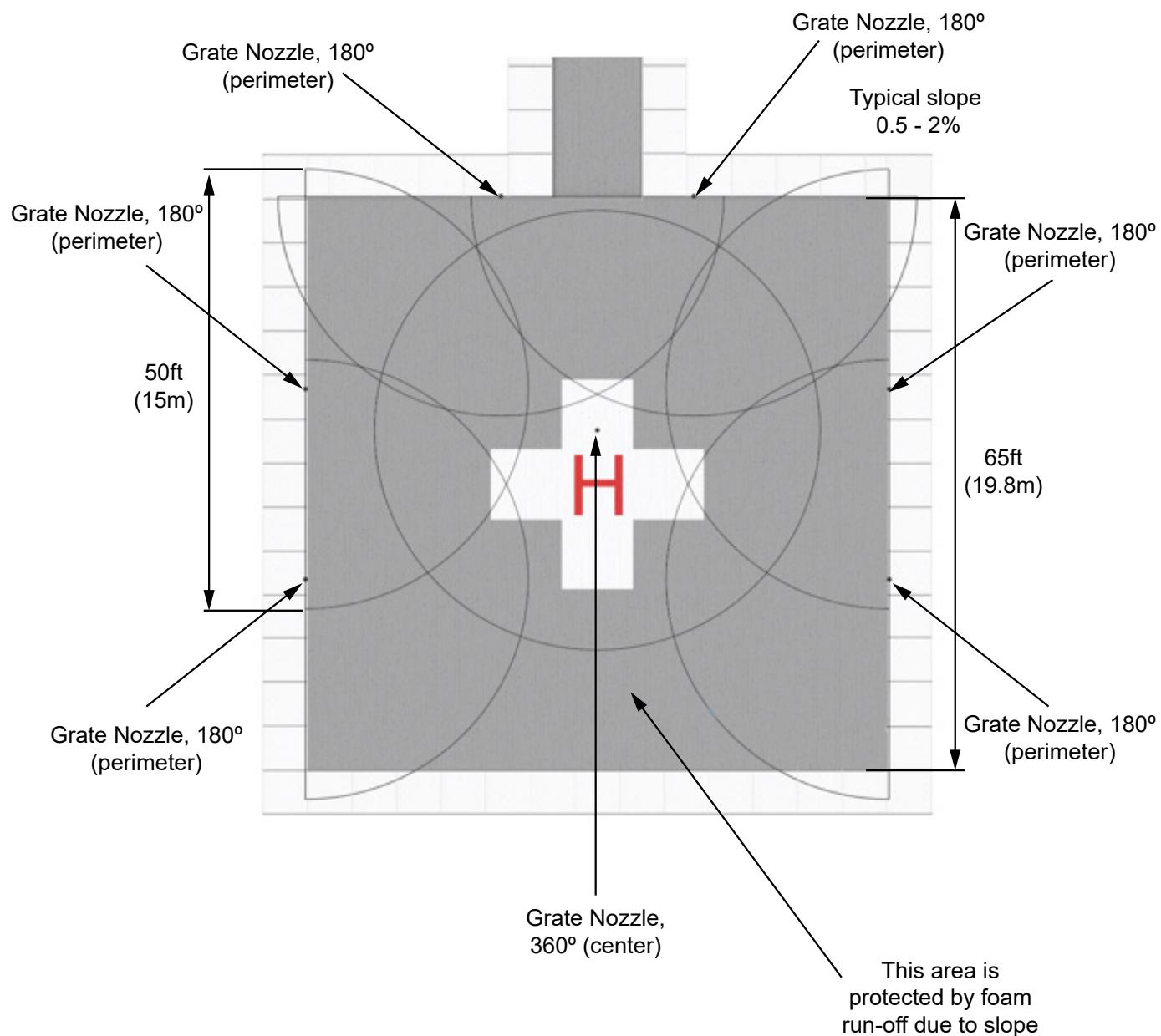


Figure 6.1.6: Typical 65' Square Heliport Protection



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## 7. INSTALLATION

### 7.1 Grate Nozzle Installation (for use in trenches)

#### NOTICE

Minimum concrete grade shall be 4500 PSI compression load in order 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 3.2.1 at the inlet to the Grate Nozzle. It is therefore recommended to use a Pressure Regulating Flow Control Valve on larger systems.

- A. The 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. Installation of the Grate Nozzle assembly and standard drain trench grates require that adequate drain trench sizing has been accounted for. (see Figure 7.1.1) Trench drain size should be defined by the architect or project engineer at an early stage and prior to installation.
- D. The Grate Nozzle is provided with a 2" grooved inlet for ease of installation and removal.
- E. 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 7.1.1)
- F. The supply piping must be self-supporting.
- G. 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.
- H. 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.
- I. The "X" frame furnished with the Grate Nozzle assembly shall be set in concrete using re-rod as shown in Figure 7.1.2.
- J. Positioning must be flush with floor, aligned for bolting of grate to frame and placed to accommodate the remaining grate drainage system. (see Figure 7.1.2 and 7.1.3)



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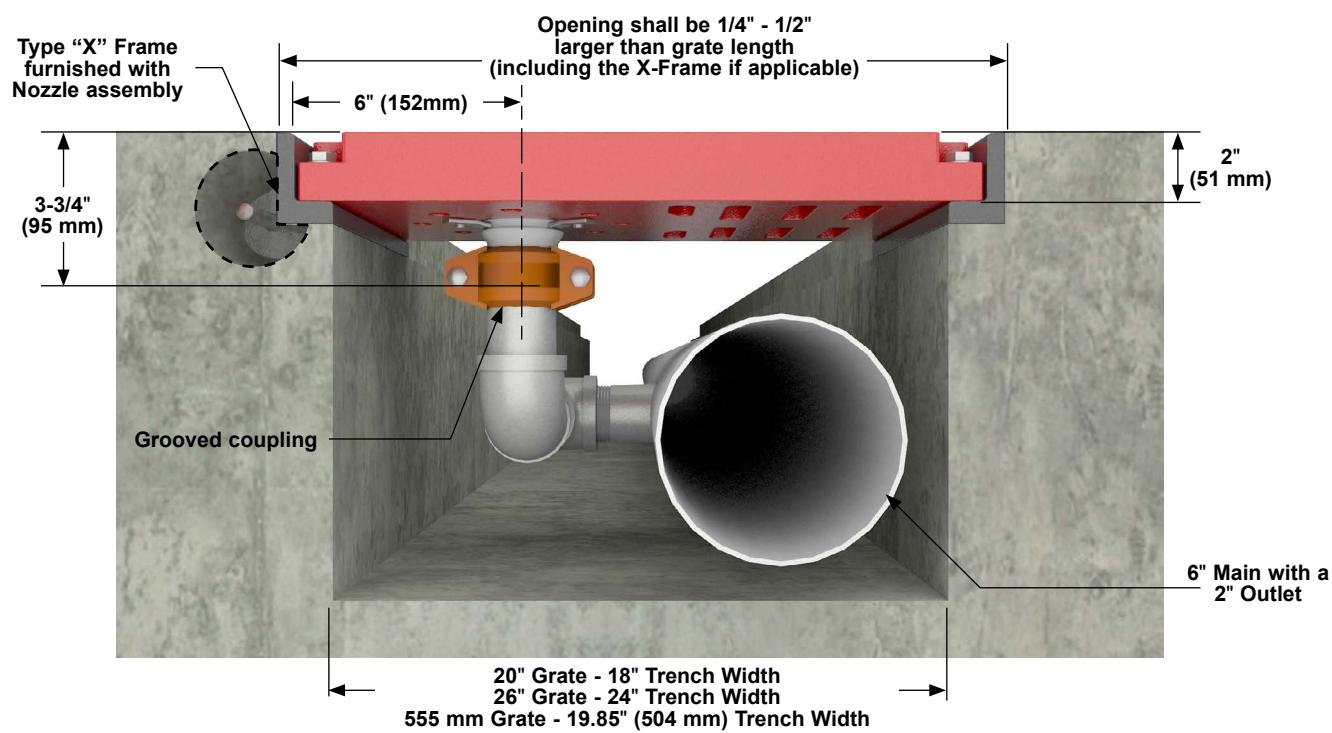
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Figure 7.1.1: Trench Installation Cross Section



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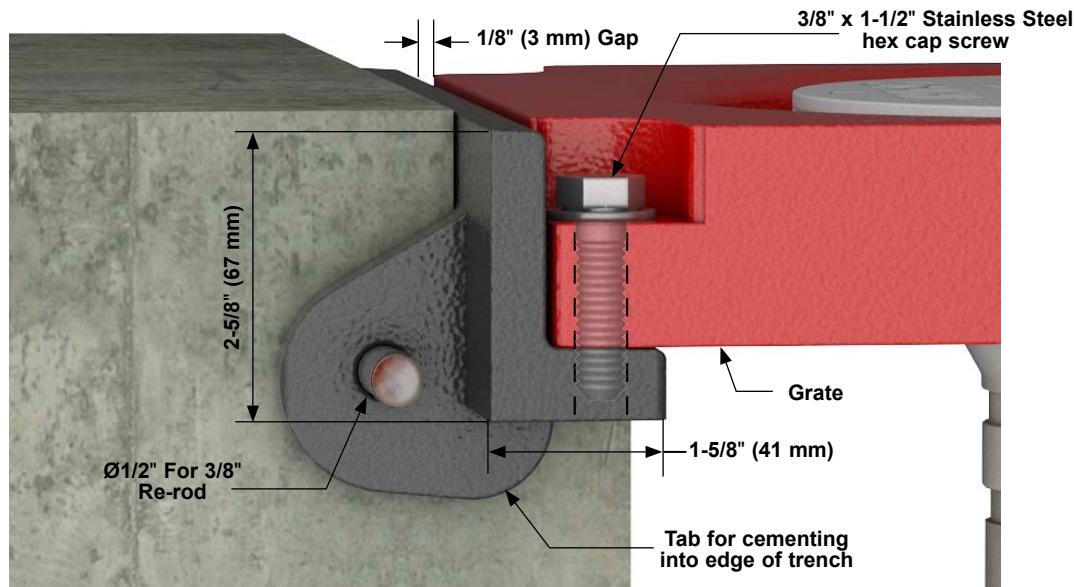
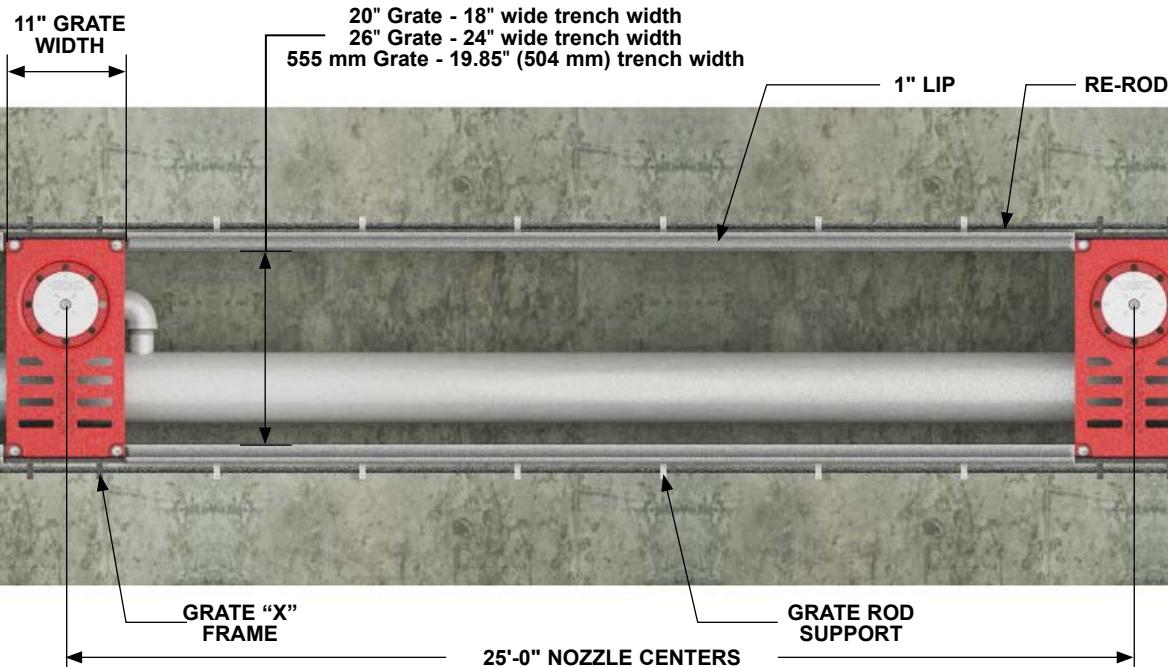
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Figure 7.1.2: X-Frame Installation Dimensions



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 7.1.3: Typical Layout for Trench Nozzles



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## 7.2 Grate Nozzle Installation (for use on helideck perimeter)

### General Notes

#### NOTICE

To prevent over discharge of foam solution, care should be taken to achieve the working pressure range defined in Table 3.2.1 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 Nozzle must be continuous, clean, and obstruction free.
- B. It is recommended that all nozzle deflectors are removed and the pipework flushed prior to commissioning.
- C. Ensure that the deflector is orientated in the correct direction on the 180° and 90° types.
- D. When removing and replacing the nozzle deflector, the deflector retaining bolt must be tightened to a minimum torque of 45 ft-lbs
- E. The supply piping must be self-supporting.
- F. 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.
- G. The Grate Nozzle must be installed flush with floor and properly aligned to allow hardware installation as well as accommodate helipad drainage system. The Grate Nozzles are not required to be in a trench.

**NOTE: Flush with surface of helipad.**

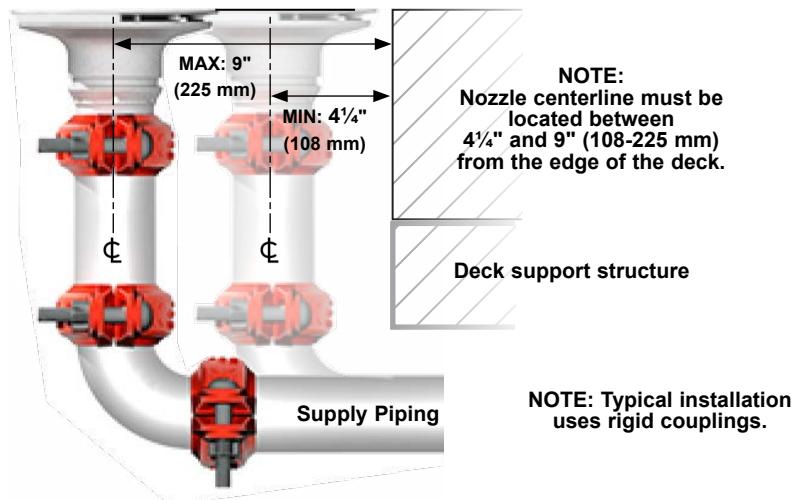


Figure 7.2.1: Typical Connection to Grate Nozzles (180° or 90°) on Helideck Perimeter



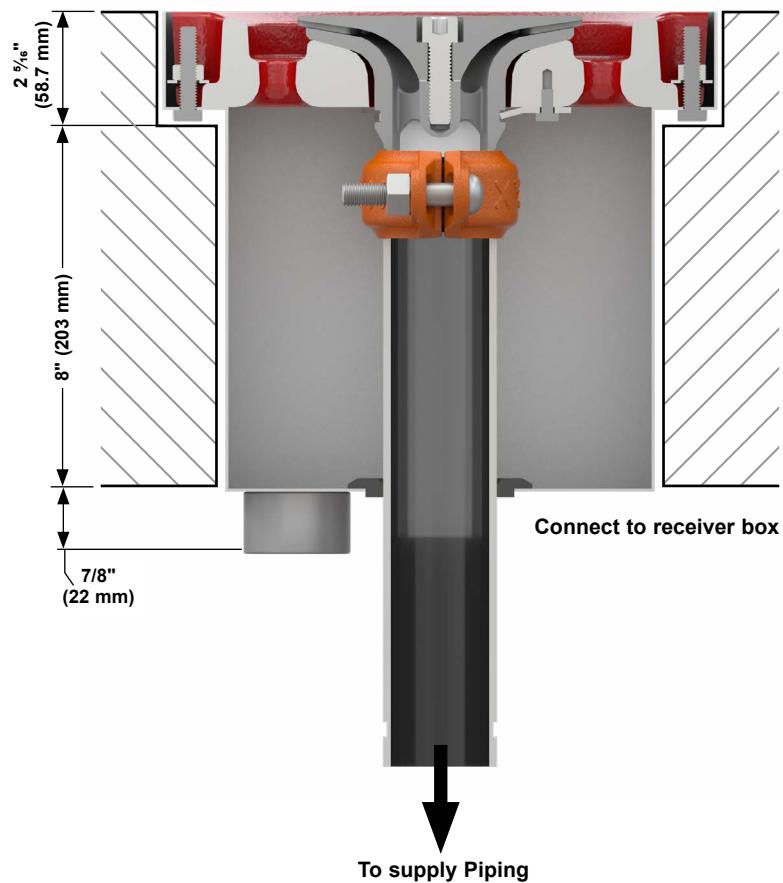
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**NOTE:** Piping must be adequately supported using hangers, brackets, or equivalents.

Figure 7.2.2: Typical Connection to Center Nozzles (360°)



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## 8. OPERATION

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

## 9. GUARANTEES

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

## 10. 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 capabilities 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 devices are part of a deluge system, system testing and maintenance shall be that of NFPA 25 and the manufacturer's recommendations.

If the devices 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 nozzle.

## 11. DISPOSAL

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





## TECHNICAL DATA

**MODEL GN202**  
**GRATE NOZZLES®**  
**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](mailto:techsvcs@vikingcorp.com)

Visit the Viking website for the latest edition of this technical data page [www.vikinggroupinc.com](http://www.vikinggroupinc.com)

## 12. ACCESSORIES AND SPARE PARTS

### Grate Nozzle Assembly

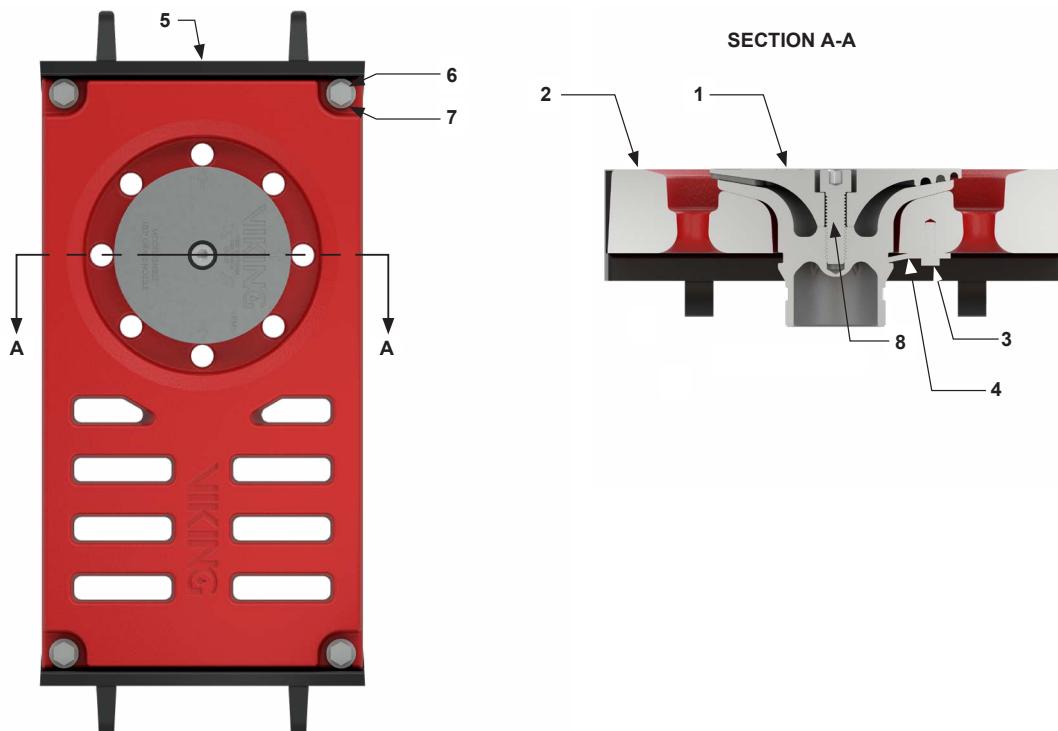


Figure 13.1.1: Replacement Parts

Ref.	PART NUMBER			DESCRIPTION	MATERIAL	No. req'd
	20" Grate	26" Grate	555mm Grate			
1	F24803			Nozzle Assembly - 360°	316 Stainless Steel	1
	F24802			Nozzle Assembly - 180°		
	F24801			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.



## TECHNICAL DATA

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**Grate Nozzle Assembly**  
**(For use on helidecks)**

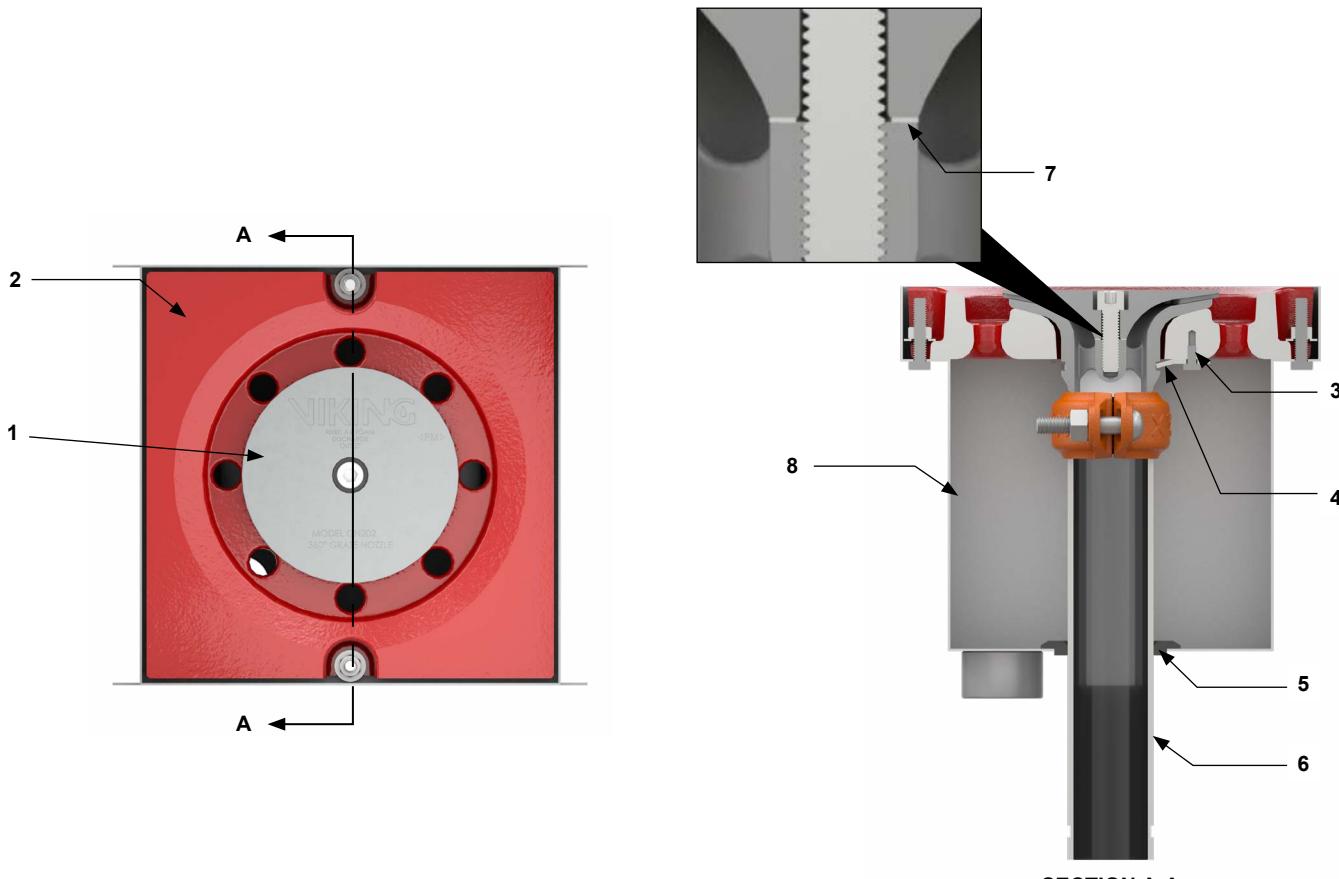


Figure 13.1.2: Replacement Parts

REF.	PART NUMBER	DESCRIPTION	MATERIAL	QUANTITY
1	F24803	Nozzle Assembly - 360°	316 Stainless Steel	1
	F24802	Nozzle Assembly - 180°		
	F24801	Nozzle Assembly - 90°		
2	F22716/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	22714	Rubber Seal	EPDM	1
6	22713	Pipe	Schedule 40, 316 Stainless Steel	1
7	F02007	PTFE Washer	PTFE	1
8	F22718	Receiver Box assembly	Stainless Steel	1