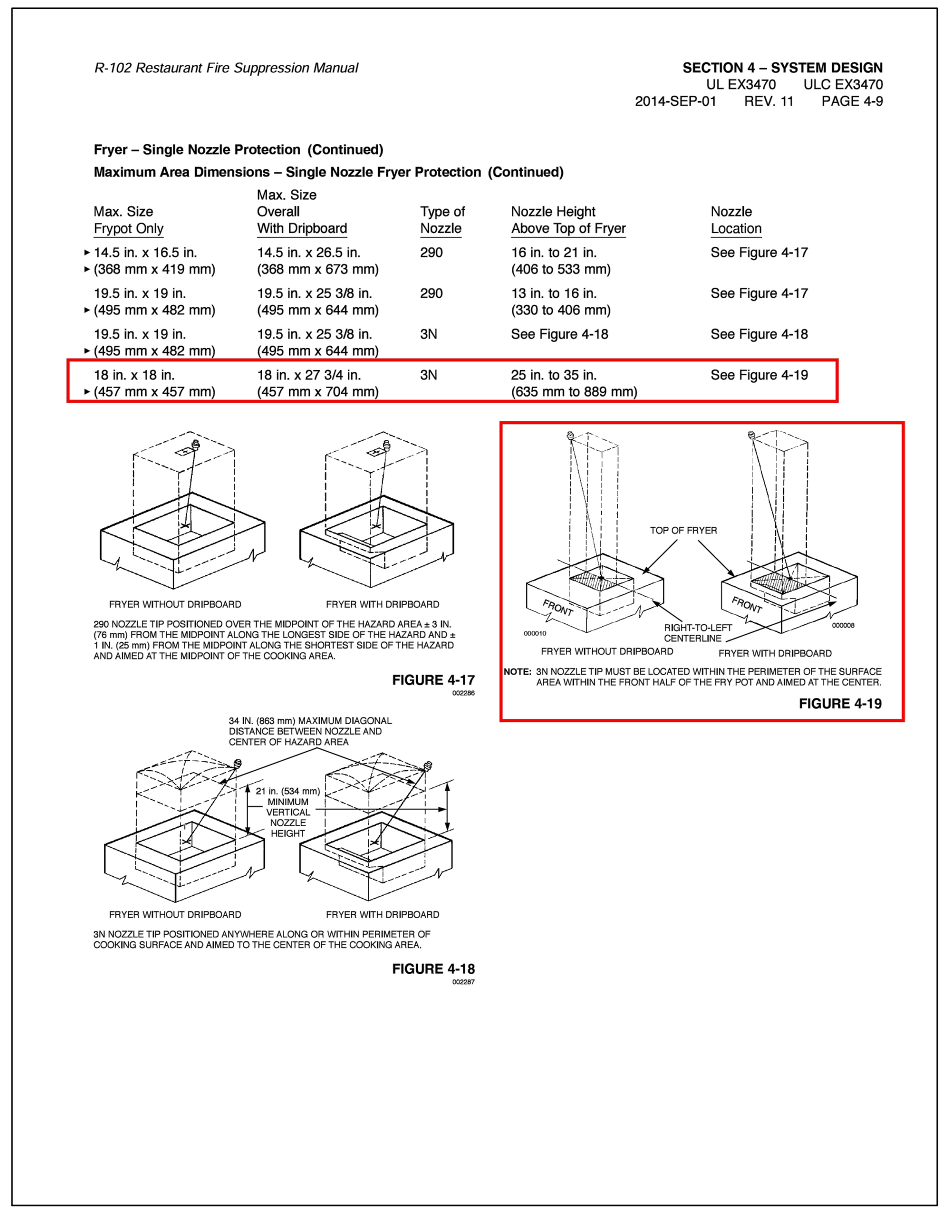

R-102 Restaurant Fire Suppression Manual

SECTION 4 – SYSTEM DESIGN
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Fryer – Single Nozzle Protection (Continued)

Maximum Area Dimensions – Single Nozzle Fryer Protection (Continued)

Max. Size Frypot Only	Max. Size Overall With Dripboard	Type of Nozzle	Nozzle Height Above Top of Fryer	Nozzle Location
▸ 14.5 in. x 16.5 in. ▸ (368 mm x 419 mm)	14.5 in. x 26.5 in. (368 mm x 673 mm)	290	16 in. to 21 in. (406 to 533 mm)	See Figure 4-17
19.5 in. x 19 in. ▸ (495 mm x 482 mm)	19.5 in. x 25 3/8 in. (495 mm x 644 mm)	290	13 in. to 16 in. (330 to 406 mm)	See Figure 4-17
19.5 in. x 19 in. ▸ (495 mm x 482 mm)	19.5 in. x 25 3/8 in. (495 mm x 644 mm)	3N	See Figure 4-18	See Figure 4-18
18 in. x 18 in. ▸ (457 mm x 457 mm)	18 in. x 27 3/4 in. (457 mm x 704 mm)	3N	25 in. to 35 in. (635 mm to 889 mm)	See Figure 4-19

FRYER WITHOUT DRIPBOARD FRYER WITH DRIPBOARD

290 NOZZLE TIP POSITIONED OVER THE MIDPOINT OF THE HAZARD AREA ± 3 IN. (76 mm) FROM THE MIDPOINT ALONG THE LONGEST SIDE OF THE HAZARD AND ± 1 IN. (25 mm) FROM THE MIDPOINT ALONG THE SHORTEST SIDE OF THE HAZARD AND AIMED AT THE MIDPOINT OF THE COOKING AREA.

FIGURE 4-17

34 IN. (863 mm) MAXIMUM DIAGONAL DISTANCE BETWEEN NOZZLE AND CENTER OF HAZARD AREA

21 in. (534 mm) MINIMUM VERTICAL NOZZLE HEIGHT

FRYER WITHOUT DRIPBOARD FRYER WITH DRIPBOARD

3N NOZZLE TIP POSITIONED ANYWHERE ALONG OR WITHIN PERIMETER OF COOKING SURFACE AND AIMED TO THE CENTER OF THE COOKING AREA.

FIGURE 4-18

TOP OF FRYER

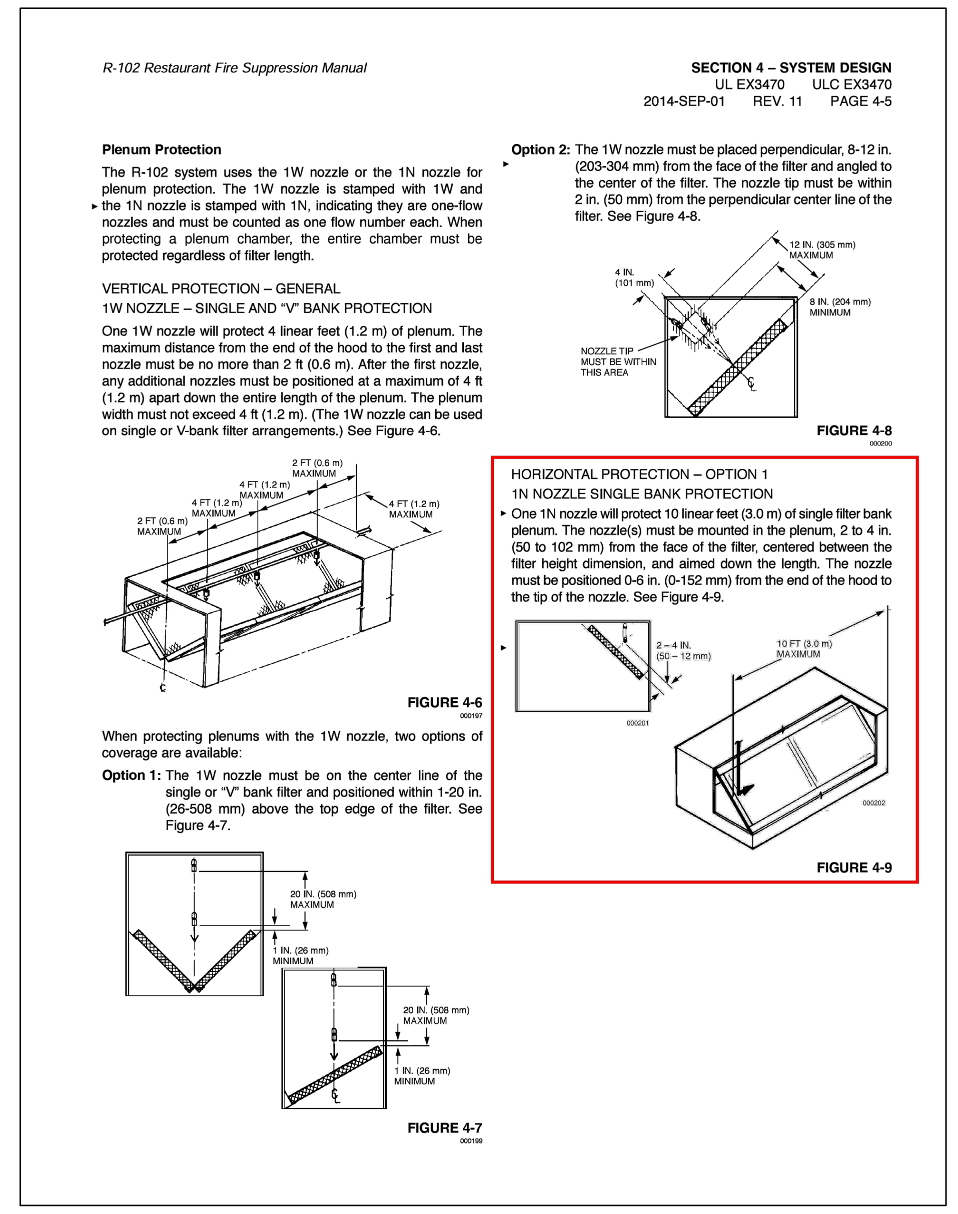
FRONT FRONT

RIGHT-TO-LEFT CENTERLINE

FRYER WITHOUT DRIPBOARD FRYER WITH DRIPBOARD

NOTE: 3N NOZZLE TIP MUST BE LOCATED WITHIN THE PERIMETER OF THE SURFACE AREA WITHIN THE FRONT HALF OF THE FRY POT AND AIMED AT THE CENTER.

FIGURE 4-19



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Plenum Protection

The R-102 system uses the 1W nozzle or the 1N nozzle for plenum protection. The 1W nozzle is stamped with 1W and ▸ the 1N nozzle is stamped with 1N, indicating they are one-flow nozzles and must be counted as one flow number each. When protecting a plenum chamber, the entire chamber must be protected regardless of filter length.

VERTICAL PROTECTION – GENERAL
1W NOZZLE – SINGLE AND "V" BANK PROTECTION

One 1W nozzle will protect 4 linear feet (1.2 m) of plenum. The maximum distance from the end of the hood to the first and last nozzle must be no more than 2 ft (0.6 m). After the first nozzle, any additional nozzles must be positioned at a maximum of 4 ft (1.2 m) apart down the entire length of the plenum. The plenum width must not exceed 4 ft (1.2 m). (The 1W nozzle can be used on single or V-bank filter arrangements.) See Figure 4-6.

2 FT (0.6 m) MAXIMUM; 4 FT (1.2 m) MAXIMUM; 4 FT (1.2 m) MAXIMUM; 2 FT (0.6 m) MAXIMUM; 4 FT (1.2 m) MAXIMUM

FIGURE 4-6

When protecting plenums with the 1W nozzle, two options of coverage are available:

Option 1: The 1W nozzle must be on the center line of the single or "V" bank filter and positioned within 1-20 in. (26-508 mm) above the top edge of the filter. See Figure 4-7.

20 IN. (508 mm) MAXIMUM; 1 IN. (26 mm) MINIMUM

FIGURE 4-7

Option 2: ▸ The 1W nozzle must be placed perpendicular, 8-12 in. (203-304 mm) from the face of the filter and angled to the center of the filter. The nozzle tip must be within 2 in. (50 mm) from the perpendicular center line of the filter. See Figure 4-8.

12 IN. (305 mm) MAXIMUM; 4 IN. (101 mm); 8 IN. (204 mm) MINIMUM; NOZZLE TIP MUST BE WITHIN THIS AREA

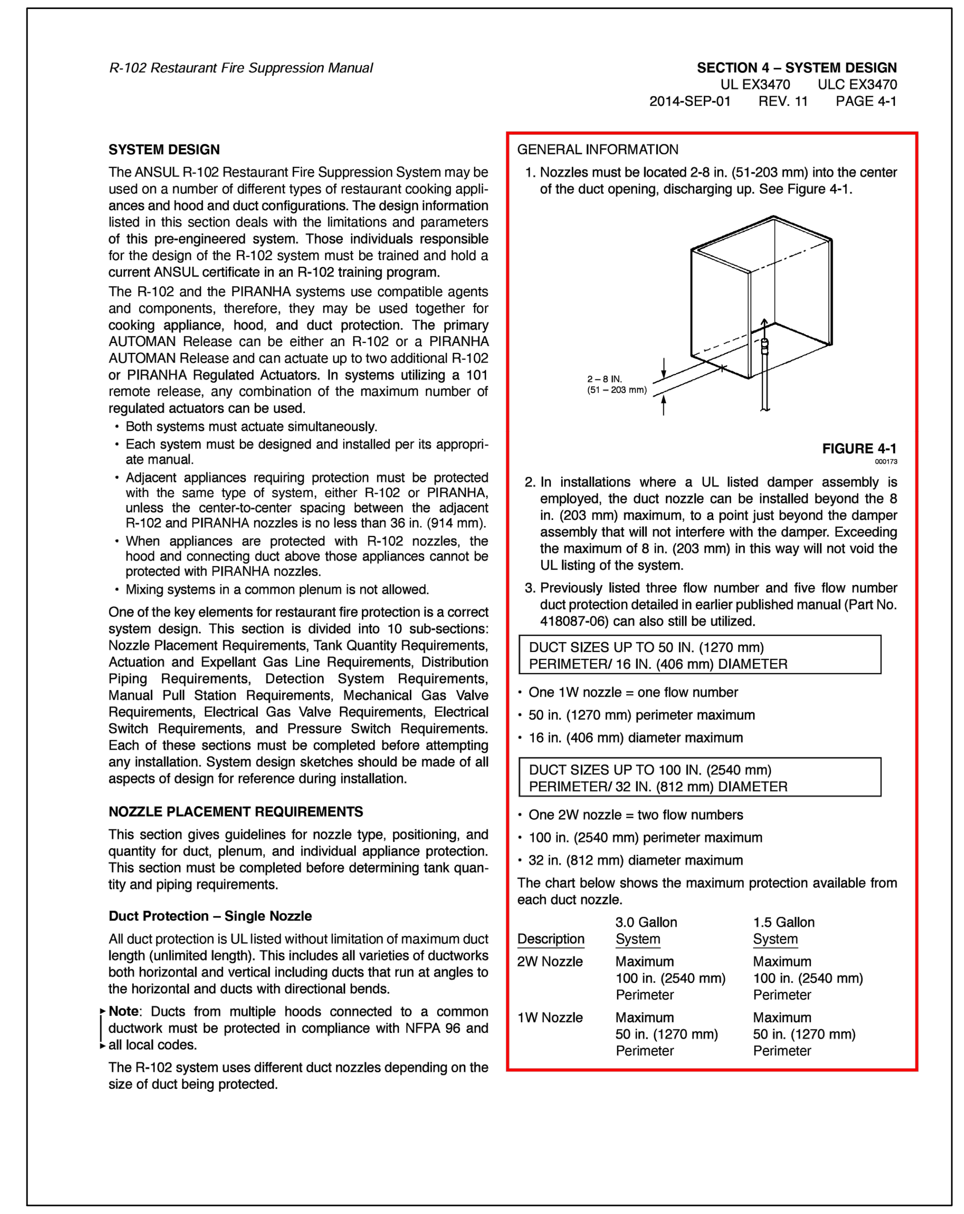
FIGURE 4-8

HORIZONTAL PROTECTION – OPTION 1
1N NOZZLE SINGLE BANK PROTECTION

▸ One 1N nozzle will protect 10 linear feet (3.0 m) of single filter bank plenum. The nozzle(s) must be mounted in the plenum, 2 to 4 in. (50 to 102 mm) from the face of the filter, centered between the filter height dimension, and aimed down the length. The nozzle must be positioned 0-6 in. (0-152 mm) from the end of the hood to the tip of the nozzle. See Figure 4-9.

2 – 4 IN. (50 – 12 mm); 10 FT (3.0 m) MAXIMUM

FIGURE 4-9



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SECTION 4 – SYSTEM DESIGN
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SYSTEM DESIGN

The ANSUL R-102 Restaurant Fire Suppression System may be used on a number of different types of restaurant cooking appliances and hood and duct configurations. The design information listed in this section deals with the limitations and parameters of this pre-engineered system. Those individuals responsible for the design of the R-102 system must be trained and hold a current ANSUL certificate in an R-102 training program.

The R-102 and the PIRANHA systems use compatible agents and components, therefore, they may be used together for cooking appliance, hood, and duct protection. The primary AUTOMAN Release can be either an R-102 or a PIRANHA AUTOMAN Release and can actuate up to two additional R-102 or PIRANHA Regulated Actuators. In systems utilizing a 101 remote release, any combination of the maximum number of regulated actuators can be used.

- Both systems must actuate simultaneously.
- Each system must be designed and installed per its appropriate manual.
- Adjacent appliances requiring protection must be protected with the same type of system, either R-102 or PIRANHA, unless the center-to-center spacing between the adjacent R-102 and PIRANHA nozzles is no less than 36 in. (914 mm).
- When appliances are protected with R-102 nozzles, the hood and connecting duct above those appliances cannot be protected with PIRANHA nozzles.
- Mixing systems in a common plenum is not allowed.

One of the key elements for restaurant fire protection is a correct system design. This section is divided into 10 sub-sections: Nozzle Placement Requirements, Tank Quantity Requirements, Actuation and Expellant Gas Line Requirements, Distribution Piping Requirements, Detection System Requirements, Manual Pull Station Requirements, Mechanical Gas Valve Requirements, Electrical Gas Valve Requirements, Electrical Switch Requirements, and Pressure Switch Requirements. Each of these sections must be completed before attempting any installation. System design sketches should be made of all aspects of design for reference during installation.

NOZZLE PLACEMENT REQUIREMENTS

This section gives guidelines for nozzle type, positioning, and quantity for duct, plenum, and individual appliance protection. This section must be completed before determining tank quantity and piping requirements.

Duct Protection – Single Nozzle

All duct protection is UL listed without limitation of maximum duct length (unlimited length). This includes all varieties of ductworks both horizontal and vertical including ducts that run at angles to the horizontal and ducts with directional bends.

▸ **Note**: Ducts from multiple hoods connected to a common ductwork must be protected in compliance with NFPA 96 and all local codes.

The R-102 system uses different duct nozzles depending on the size of duct being protected.

GENERAL INFORMATION

1. Nozzles must be located 2-8 in. (51-203 mm) into the center of the duct opening, discharging up. See Figure 4-1.

2 – 8 IN. (51 – 203 mm)

FIGURE 4-1

2. In installations where a UL listed damper assembly is employed, the duct nozzle can be installed beyond the 8 in. (203 mm) maximum, to a point just beyond the damper assembly that will not interfere with the damper. Exceeding the maximum of 8 in. (203 mm) in this way will not void the UL listing of the system.
3. Previously listed three flow number and five flow number duct protection detailed in earlier published manual (Part No. 418087-06) can also still be utilized.

DUCT SIZES UP TO 50 IN. (1270 mm) PERIMETER/ 16 IN. (406 mm) DIAMETER

- One 1W nozzle = one flow number
- 50 in. (1270 mm) perimeter maximum
- 16 in. (406 mm) diameter maximum

DUCT SIZES UP TO 100 IN. (2540 mm) PERIMETER/ 32 IN. (812 mm) DIAMETER

- One 2W nozzle = two flow numbers
- 100 in. (2540 mm) perimeter maximum
- 32 in. (812 mm) diameter maximum

The chart below shows the maximum protection available from each duct nozzle.

Description	3.0 Gallon System	1.5 Gallon System
2W Nozzle	Maximum 100 in. (2540 mm) Perimeter	Maximum 100 in. (2540 mm) Perimeter
1W Nozzle	Maximum 50 in. (1270 mm) Perimeter	Maximum 50 in. (1270 mm) Perimeter

ANSUL R-102 DETAILS

* DETECTOR TEMP PER ANSUL MANUAL PAGE 3-11 REV 11, 4-71 TO 4-72 REV 11
* ALL PIPING 3/8" SCH. 40 BLACK STEEL PER ANSUL MANUAL PAGE 4-67 TO 4-69, REV 11
* ALL FITINGS 3/8" 150# BLACK STEEL PER ANSUL MANUAL PAGE 4-67 TO 4-69, REV 11
* ALL NOZZLES POSITIONED PER ANSUL MANUAL, SECTION 4
* PULL STATION IN AISLE OF EGRESS
* ELECTRIC APPLIANCES W/ SHUT-OFF
* MICRO SWITCH FOR SHUT DOWNS & ALARM TIE IN

CERTIFICATE OF TRAINING

Johnson Controls

It is hereby certified that

Michael Edwards

BFPE INTERNATIONAL -CLAYTON

has successfully completed the training course for

ANSUL R-102 Restaurant Fire Suppression Systems - Online Recertification

Completed On 9/9/2022

This certificate is considered valid for a period of three years from completion date and linked to the attendee and the company mentioned above.

Training Hours:

ANSUL

Matt Boyle
Technical Training Manager – Fire Suppression

ANSUL R-102 3 GALLON
UL 300

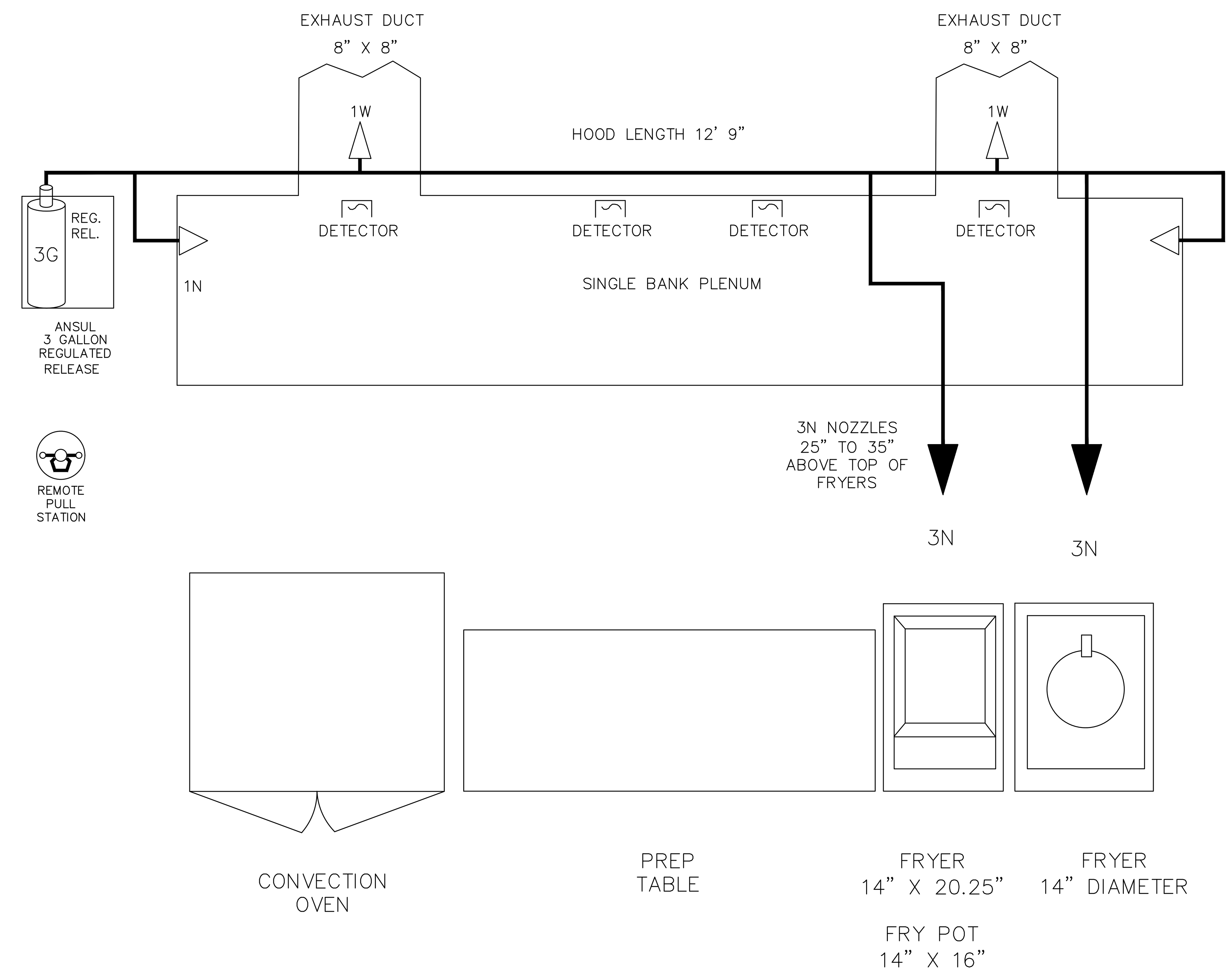
11 FLOW POINTS AVAILABLE
10 FLOW POINTS UTILIZED

APPLIANCE FLOW POINT TOTAL: 6
DUCT FLOW POINT TOTAL: 2
PLENUM FLOW POINT TOTAL: 2

SYSTEM FLOW POINT TOTAL: 10

EXISTING NOZZLES

RELOCATED NOZZLE



MARK | REVISION | BY | DATE

REVISIONS:

Seal

Pre-engineered Fire System Seal Not Required

SHOP DRAWINGS

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(919) 550 - 2699

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DATE: May 8, 2024
PROJECT NO: N/A

Sheet Contents:
Deli Fire Suppression System

Food Lion #2188
1655 Buffalo Lake Road
Spout Springs, NC 27332

DRAWING NO.:
FS100

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